



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
14.09.2016 Bulletin 2016/37

(51) Int Cl.:
B65D 5/66 (2006.01)

(21) Application number: **16158352.1**

(22) Date of filing: **03.03.2016**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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(30) Priority: **13.03.2015 DE 202015101298 U**

(54) **CARDBOARD BOX**

(57) It is a basic idea of the invention to provide a multi-purpose cardboard box which is convertible to the tray. In a tray position the box presents increased comfort for the consumer when consuming food by presenting a continuous tray surface, which in particular is substantially flat. In the box position, food received in the box may be handled, dispensed to a consumer and taken away by the consumer in a comfortable manner. For con-

suming the food, the consumer converts the box from the box position into the tray position, thereby presenting a continuous tray surface on which the food may be consumed, for example using cuttlery. It is particularly possible to include disposable cuttlery in the box.

Thus, the invention provides a multi-purpose box for handling and consuming food, said box being easy to handle.

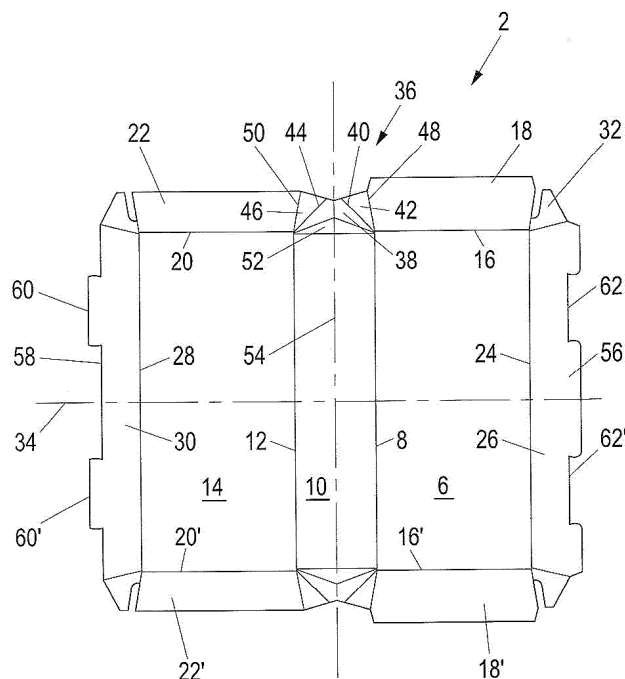


Fig. 1

Description

[0001] The invention relates to a cardboard box, which is convertible into a tray.

[0002] When handling food, for example during the catering onboard of aircrafts or in fastfood restaurants, it is an object that a container receiving the food shall be designed such that on one hand it is suitable for handling and storing the food prior to delivering the same to the consumer, while simultaneously the container should give the consumer the opportunity to consume the food in a simple and comfortable manner.

[0003] EP 2 364 924 A1 discloses a plastic container which is particularly suitable for catering purposes onboard of aircrafts. The container includes a lower part and an upper part wherein the lower part is connected to the upper part by means of a hinch and wherein the upper part is pivotable relative to the lower part between a closed position, in which the upper part is hinged onto the lower part, and an open position. The container disclosed in the document includes a stop for limiting a pivoting of the upper part relative to the lower part such that in the open position of the container the bottom side of the lower part is aligned with the upper side of the upper part.

[0004] It is an object of the invention to provide a container for receiving food, which presents an improved comfort for a consumer when handling and consuming the food contained in the container.

[0005] This object is achieved by the invention as claimed in claim 1.

[0006] It is a basic idea of the invention to provide a multi-purpose cardboard box which is convertible to the tray. In a tray position the box presents increased comfort for the consumer when consuming food by presenting a continuous tray surface, which in particular is substantially flat. In the box position, food received in the box may be handled, dispensed to a consumer and taken away by the consumer in a comfortable manner. For consuming the food, the consumer converts the box from the box position into the tray position, thereby presenting a continuous tray surface on which the food may be consumed, for example using cutlery. It is particularly possible to include disposable cutlery in the box.

[0007] Thus, the invention provides a multi-purpose box for handling and consuming food, said box being easy to handle.

[0008] It is a further advantage of the invention that the box which is the subject matter of the invention is manufactured from cardboard and therefore may be manufactured at relatively low cost.

[0009] It is a particular advantage of the invention that the box manufactured from cardboard is completely and genuinely recyclable. This is environmentally-friendly and saves the valuable resources.

[0010] Advantageous further embodiments of the invention are defined in the subclaims.

[0011] The invention will be explained in greater detail

with reference to the enclosed drawings in which an embodiment is shown. Throughout the specification, all features described, shown in the drawing and claimed in the claims constitute the subject matter of the invention, either taken alone or in any arbitrary combination, regardless of their combination in the claims and the references of the claims as well as regardless of their concrete description or representation in the drawing respectively.

10 In the drawings:

[0012]

- FIG. 1 shows a plan view of a cardboard blank for manufacturing an embodiment of a cardboard box according to the invention, which is convertible into a tray,
- FIG. 2 a perspective view of the embodiment of the box according to the invention in a box position (closed position),
- FIG. 3 in the same representation as FIG. 2 the box according to FIG. 2 in its tray position (open position),
- FIG. 4 in increased scale a perspective view of a detail in the area of a hinch element and
- FIG. 5-7 a detail of the hinch element in different kinematic phases during a closing process of the box.

30 **[0013]** For explaining the invention in detail, the following references are made from FIG. 1 to 7.

[0014] FIG. 1 shows an embodiment of a integral cardboard blank 2 for manufacturing a box 4 (see FIG. 2) according to the invention. The enclosure of the invention also includes geometrical relationships and technical conditions as well as the size ratio of components of the box 4 according to the invention, regardless of whether they are mentioned in the following description.

[0015] The cardboard blank 2 includes a lid part 6 which via a folding line 8 a rear wall part 10 is connected. To the end of the rear wall part 10 facing away from the lid part 6 a bottom part 10 is connected via a further folding line 12. The first sidewall parts 18, 18' are hinged to the sides of the lid part 6 via folding lines 16, 16'. In a corresponding manner, a second sidewall part 22, 22' are hinged to the bottom part 14 via folding lines 20, 20'.

[0016] A third sidewall part 16 is hinged to the end of the lid part 6 facing away from the rear wall part 10. In a corresponding manner, a fourth sidewall part 30 is hinged to the end of the bottom part 14 facing away from the rear wall part 10. In the areas in which the third sidewall part 26 is adjacent to the first sidewall parts 18, 18' and the fourth sidewall part 30 is adjacent to the second sidewall parts 20, 22 a glue tab is provided respectively. In FIG. 1 a single glue tab exemplarily is referenced by reference no. 32.

[0017] For constructing the box 4 from the cardboard blank 2, the sidewall parts 18, 18', 26, 22, 22' and 30 are

aligned substantially perpendicularly relative to the lid part 6 and the bottom part 14 respectively and are fixed in this position by means of glueing the glue tabs 32.

[0018] The cardboard blank 2 is symmetrical along a symmetry axis which is symbolized in FIG. 1 by a dot-dashed line 34. In the following, only the upper part of FIG. 1 will be explained in greater detail. The lower part of FIG. 1 is constructed in a corresponding manner and therefore will not be explained in greater detail.

[0019] The first sidewall part associated with the lid part 6 is connected with the second sidewall part 22 associated with the bottom part 14 by means of a flaplike hinge element 36 which will be explained below in greater detail.

[0020] The hinge element 36 is embodied and provided with folding lines such that

- in the tray position (see FIG. 3) the hinge element 36 is stretched and connects the associated first sidewall part 18 and the second sidewall part 22 at a distance, wherein the lid part 6 the rear wall part 10 and the bottom part 14 are parallel or substantially parallel to each other and perpendicular or substantially perpendicular relative to the rear wall part 10, wherein the associated first sidewall part 18 is positioned alongside the second sidewall part 22 (see FIG.2).
- the hinge element 36 includes a center flap part 38 to which via a first flap folding line 40 a first outer flap part 42 and via a second flap folding line 14 a second outer flap part 46 is hinged wherein the first outer flap part 42 is hinged to the associated first sidewall part 18 via a third flap folding line 48 and the second outer flap part 46 is hinged to the associated second side wall part 22 via a force flap folding line 50.

[0021] As can be seen from FIG. 1, the first outer flap part 42 and the second outer flap part 46 have a triangular shape respectively, wherein the first outer flap part 24 is slightly smaller than the second outer flap part 46.

[0022] As furthermore can be seen from FIG. 1, the triangle limiting the respective outer flap part 42, 46 is an acute triangle. With the outer flap part associated with the first sidewall part 18, the longer side of the triangle constitute on hand the third flap folding line 48 at the first sidewall part 18 and the first flap folding line 40 at the center flap part 38, wherein the shorter side of the triangle defines the free rim of the first outer flap part 42.

[0023] The second outer flap part 46 is structured correspondingly.

[0024] As furthermore can be seen from FIG. 1, the flap folding lines 40, 48 and 44, 50 respectively, associated with an outer flap part 42, 46 respectively, define an acute angle.

[0025] The center flap part 38 is separated from the rear wall part 10 by a triangular-shape cutout 52 (opening).

[0026] As furthermore can be seen from FIG. 1, a third flap folding line 48 defines an acute angle with the folding line 48 between the lid part 6 and the rear wall part 10 and is inclined towards the center flap part. The same holds for the fourth flap folding line 50 relative to the folding line 12 between the rear wall part 10 and the bottom part 14.

[0027] In the embodiment shown in the drawings, the center flap part 38 is slightly asymmetrical along a symmetry axis 54 which is parallel to the folding lines 8, 12. In detail, the center flap part 38 is almost symmetrical to the symmetry axis 54, however, has a distinct asymmetry which in connection with the slightly different size of the outer flap parts 42, 46 provides that the upper part of the box 4 overlaps the lower part, when the box 4 is converted from the tray position into the box position.

[0028] FIG. 2 shows the box 4 in the box position, while FIG. 3 shows the box 4 in the tray position.

[0029] In the embodiment shown in the drawings, fixing means for detachably fixing the box 4 in the box position. For this purpose (see FIG. 1 - FIG. 3) a clamping tab 56 is located at the third sidewall part 26, said clamping tab 56 engaging a clamping cutout 58, provided at the fourth sidewall part. In a corresponding manner, clamping tabs 60, 60' are provided at the fourth sidewall part, said clamping tabs 60, 60' engaging a clamping cutout 62, 62' provided in the third sidewall part 26 in the box position of the box 4 (see FIG. 2).

[0030] In the following, the operation of the hinge element 36 will be explained for further reference to FIG. 4 - FIG. 7. As can be seen from FIG. 3, in the tray position shown in FIG. 3, the hinge element 36 is in an elongated position connecting the associated first and second sidewall parts 18, 22 at a distance. In this tray position, the lid part 6, the rear wall part 10 and the bottom part 14 are located in the same plain and constitute a continuous tray surface, on which food received in the box 4 may be consumed. Due to the continuous tray surface, it is particularly possible to consume food contained in the box 4 using cutlery.

[0031] In practice, the box 4 with food contained therein is dispensed to a consumer in the box position (see FIG. 2). The consumer opens the box 4 and brings the same into the tray position shown in FIG. 3. For illustration purposes, the operation of the hinge element 36 is explained for the different operations in which the box 4 is converted from the tray position into the box position.

[0032] In the following, reference is made to FIG. 4-7. FIG. 4 shows the box 4 in an intermediate position between the box position (closed position) and the tray position (open position). FIG. 5-7 show an illustration model of the hinge element 36. For closing the box 4, the upper part 64 of the box 4 constituted by the lid part 6 and the sidewall parts 18, 18' and 26 is hinged onto the lower part 66, constituted by the bottom part 14 and the sidewall part 22, 22' and 30 (see FIG. 3 and FIG. 2). Upon closing the box 4, the hinge element 36 folds along the flap folding lines 40, 44, 48, 50, as can be seen from FIG. 4.

[0033] FIG. 5 shows the hinge element 36 in an intermediate position approximately corresponding to FIG. 4, in which the hinge element 36 begins to fold.

[0034] When the box 4 is further closed, the center flap part 38 moves towards the rear wall part 10, wherein the outer flap part 42, 46 fold onto the center flap part 38. Due to the intentionally introduced asymmetry of the hinge element 36, it is made sure that the folding operation proceeds such that the upper part 46 overlaps the lower part 66.

[0035] FIG. 7 shows the hinge element 36 in the end position of the folding operation, which corresponds to the closed position (box position) of the box 4, as shown in FIG. 2.

[0036] In this position, the center flap part 38 abuts against the rear wall part 10 or is positioned with a slight distance towards the same. Simultaneously, the outer flap part 42, 46 abut against the center flap part 38 on the side facing away from the rear wall part 10 or are positioned with a slight distance to the same. For opening the box, the operation is reversed, wherein the hinge element 36 is again brought into an elongated position.

[0037] The invention provides a box 4, which is convertible into a tray which in a tray position gives the consumer a high comfort for consuming food by presenting a continuous tray surface, on which food may be consumed for example using cutlery.

Claims

1. Cardboard box for receiving food, said box (4) being convertible into a tray, said box including a lid part (6) which in a box position of the box (4) constitutes a part of an upper part (64) of the box (4), a bottom part (14), which in the box position of the box (4) constitutes a part of an upper part (66) of the box (4), a rear wall part (10) which in the box position of the box constitutes the rear wall thereof, wherein the rear wall part (10) is hinged to the bottom part (6) and the lid part (14), wherein along the circumference of the lid part (6) and the bottom part (18) sidewall parts (18, 18', 22, 22', 26, 30) are provided which are relative to the associated lid part (6) and the bottom part (14) respectively have a perpendicular or substantially perpendicular position, wherein the first sidewall parts (18, 18') associated with the lid part (6) are connected to second sidewall parts (22, 22') associated with the bottom part (14) via a flaplike hinge element (36, 36') respectively and wherein the respective hinge element (36, 36') is embodied and provided with folding lines such that

- in the tray position the hinge element (36, 36') is in an elongated position connecting the associated first and second sidewall parts (18, 22;

18', 22') at a distance, wherein the lid part (6) the rear wall part (10) and the bottom part (14) are located in the same plain or substantially in the same plain constituting a continuous tray surface and

- in the box position the hinge element (36, 36') is folded towards the rear wall part 10 along the folding lines wherein the lid part (6) and the bottom part (14) are parallel or substantially parallel to each other and perpendicular or substantially perpendicular relative to the rear wall part (10), wherein the respective first sidewall part (18, 18') is located alongside the associated second sidewall part (22, 22').

2. Box, as claimed in claim 1, wherein the respective hinge element 36 includes a center flap part (38) to which along a first flap folding line (40) a first outer flap part (42) and along a second flap folding line (44) a second outer flap part is hinged, wherein the first flap part is hinged via a third flap folding line (48) to the associated first sidewall part (18) and wherein the second outer flap part (46) is hinged to the second sidewall part (22) via a fourth flap folding line (50).
3. Box, as claimed in claim 2, wherein the first outer flap part (42) and a second outer flap part (46) have a triangular shape respectively.
4. Box, as claimed in claim 3, wherein a triangle defining the respective outer flap part (42, 46) is an acute triangle.
5. Box, as claimed in claim 4, wherein the triangle includes two longer sides and one shorter side.
6. Box, as claimed in claim 4, wherein at the first outer flap part (42) associated with the first sidewall part (18) the longer sides of the triangle constitute the third flap folding line (48) at the associated first sidewall part (18) and the first flap folding line (40) at the center flap part (38), wherein the shorter side of the triangle defines a free rim of the first outer flap part (42).
7. Box, as claimed in any of the proceedings claimed 2 to 6, wherein at the outer flap part (46) associated with the second sidewall part (22) the longer sides of the triangle constitutes the fourth flap folding line (50) at the associated second sidewall part (22) and the second flap folding line (44) at the center flap part (38), wherein the shorter side of the triangle defines a free rim of the second outer flap part (46).
8. Box, as claimed in any of the proceeding claims 2 to 7, wherein the flap folding lines (40, 48; 44, 50) are associated with an outer flap part (42, 46) constitute

an acute angle.

9. Box, as claimed in any of the proceeding claims 2 to 8, wherein the center flap part (38) is separated from the rear wall part (10) by means of a triangular-shaped cutout (52). 5
10. Box, as claimed in any of the proceeding claims 2 to 9, wherein the third flap folding line (48) constitutes an acute angle with a folding line (8) between the rear wall part (10) and the lid part (6), wherein the third flap folding line (48) is inclined towards the center flap part (38). 10
11. Box, as claimed in any of the proceeding claims 2 to 10, wherein the fourth flap folding line (50) and a folding line (12) between the rear wall part (10) and the bottom part (14) constitute an acute angle, wherein the fourth flap folding line (50) is inclined towards the center flap part (38). 20
12. Box, as claimed in any of the proceeding claims 2 to 11, wherein the center flap part (38) is slightly asymmetrical along a symmetry axis which is parallel to the folding lines (8, 12) between the bottom part (14) and the rear wall part (10) and between the part (6) and the rear wall part (10) respectively. 25
13. Box, as claimed in any of the proceeding claims, wherein a third sidewall part (26) is hinged to the lid part (6), wherein the third sidewall part (26) is connected to the first sidewall part (18, 18') at its ends, in particular by means of at least one glue tab (32). 30
14. Box, as claimed in any of the proceeding claims, wherein a fourth sidewall part 30 is hinged to the bottom part (14), wherein the fourth sidewall part (30) is connected to the second sidewall part (22, 22') at its ends, in particular by means of at least one glue tab (32). 40
15. Box, as claimed in any of the proceeding claims, wherein fixing means for detachably fixing the box (4) in the box position are provided. 45
16. Box, as claimed in claim 14, wherein the fixing means include at least one clamping tab (56; 60, 60') located on the third sidewall part (26) or the fourth sidewall part (30), said clamping tab (56; 60, 60') in the box position engages a clamping cutout (58; 62, 62') located on the other sidewall part (30; 26). 50
17. Box, as claimed in any of the proceeding claims, wherein the upper part (46) of the box (4) constituted by the lid part (6) with the associated sidewall part (18, 18') is dimensioned relative to a lower part (66) constituted by the bottom part (14) and the associated sidewall part (22, 22') such that in the box po-

sition the upper part (46) overlaps the lower part (66).

18. Box, as claimed in claim 12 and 17, wherein the asymmetry of the center flap part (38) is chosen such and the outer flap part (42, 46) are dimensioned relative to each other such that the upper part (46) overlaps the lower part (66), when the upper part (46) is moved from the tablet position into the box position.
19. Box, as claimed in any of the proceeding claims, wherein the parts of the box (4) are constituted by an integral cardboard blanket (2).
20. Cardboard blank (2) for manufacturing a box (4) as claimed in any of the proceeding claims.
21. Cardboard blank, as claimed in claim 20, wherein the same is integral.

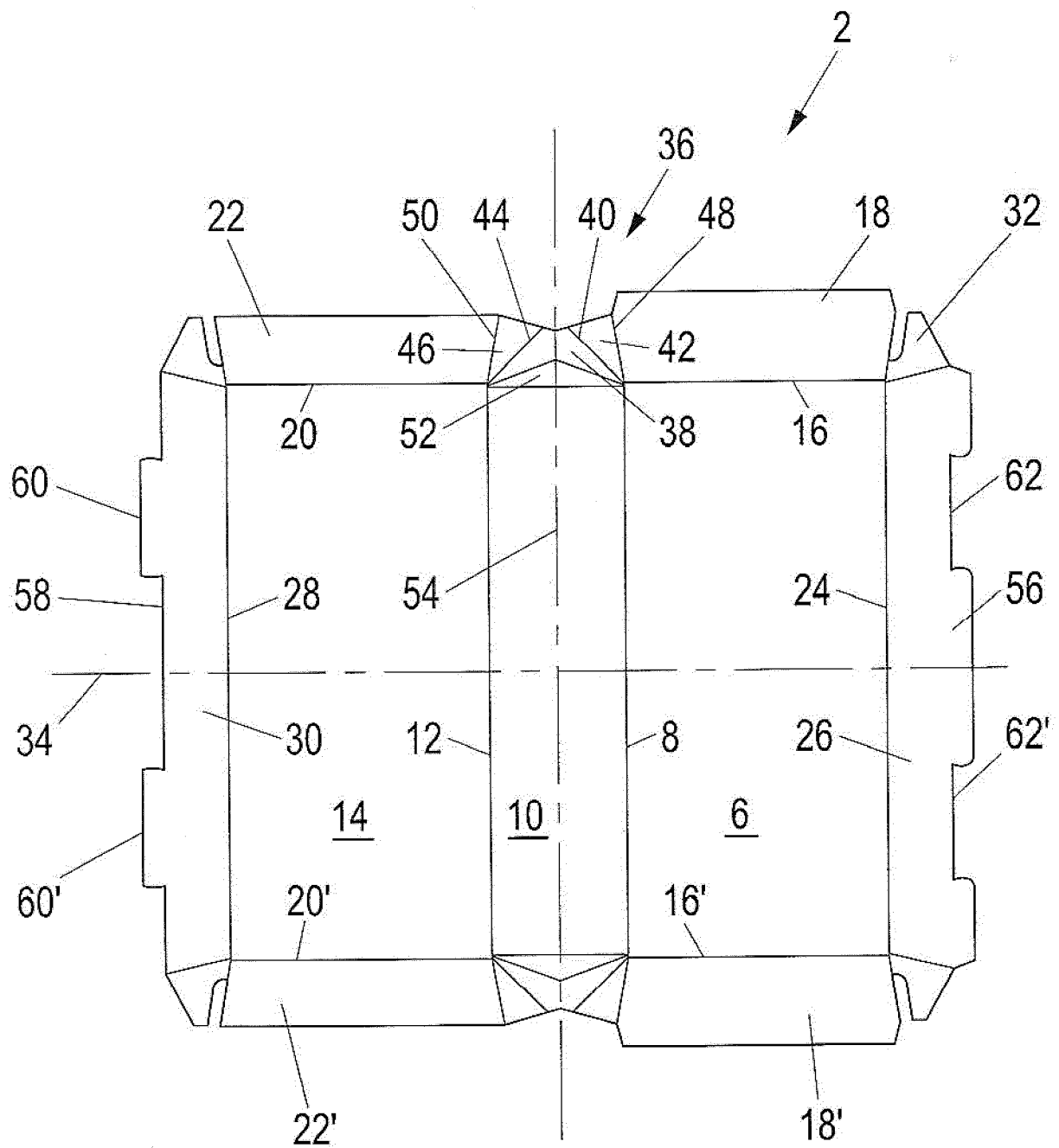


Fig. 1

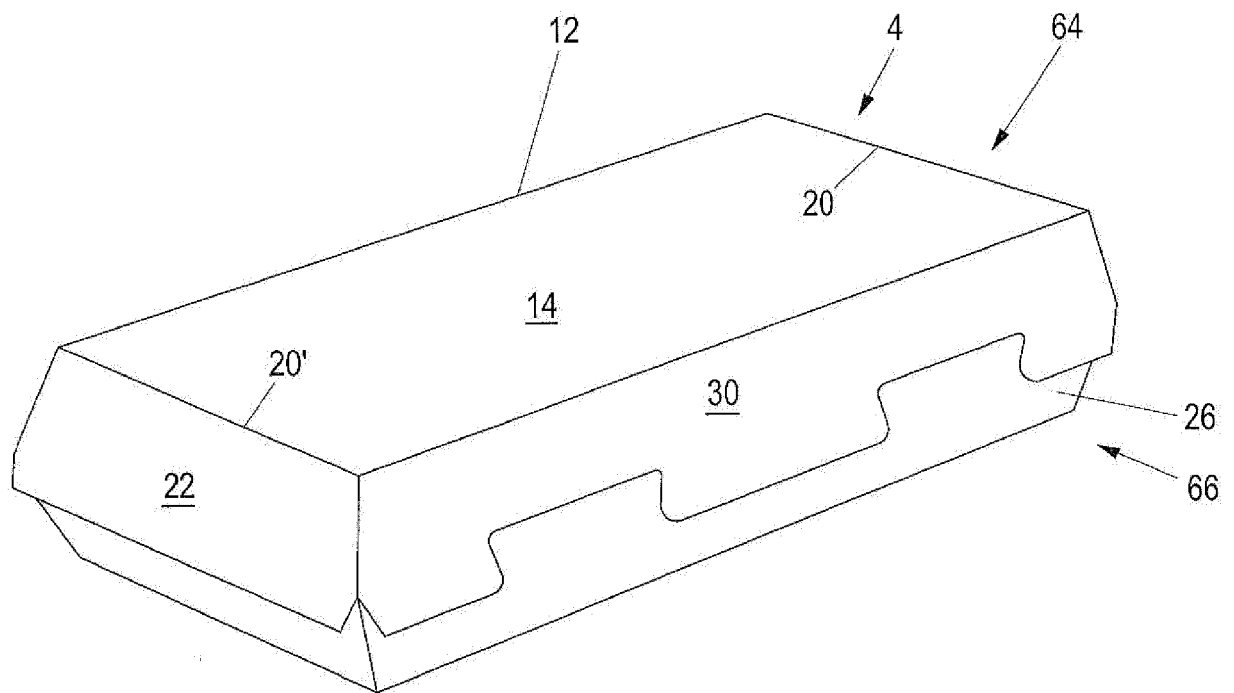


Fig. 2

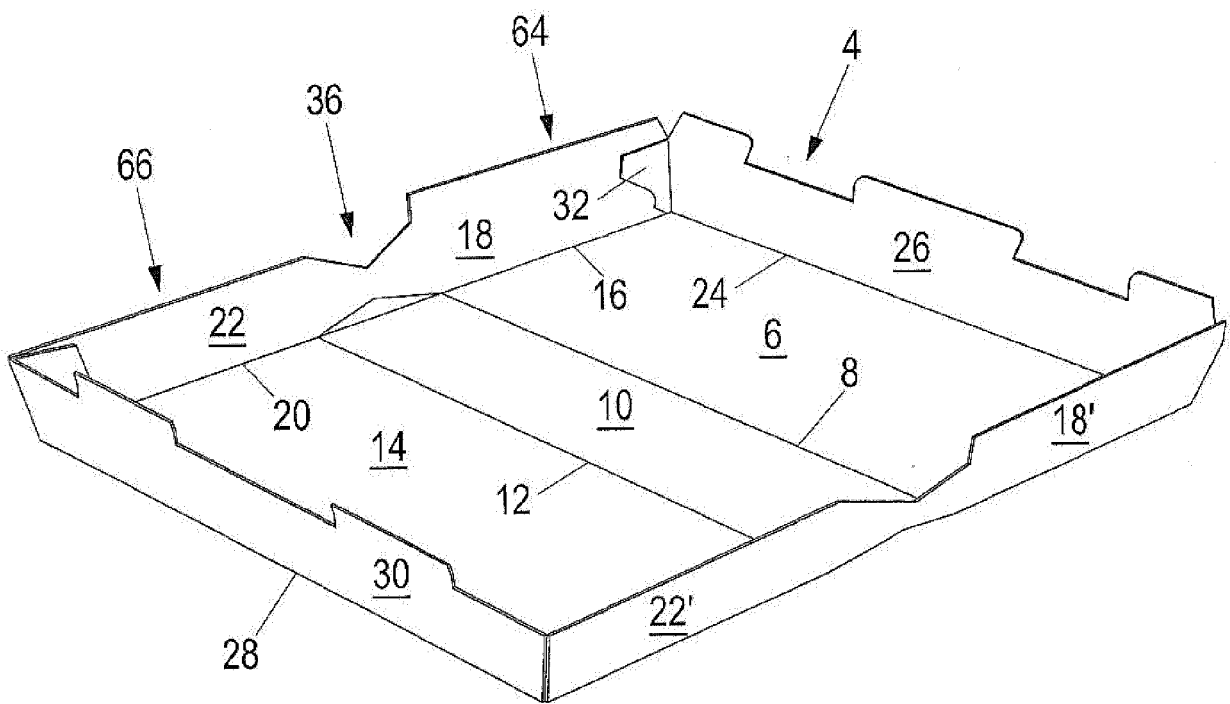


Fig. 3

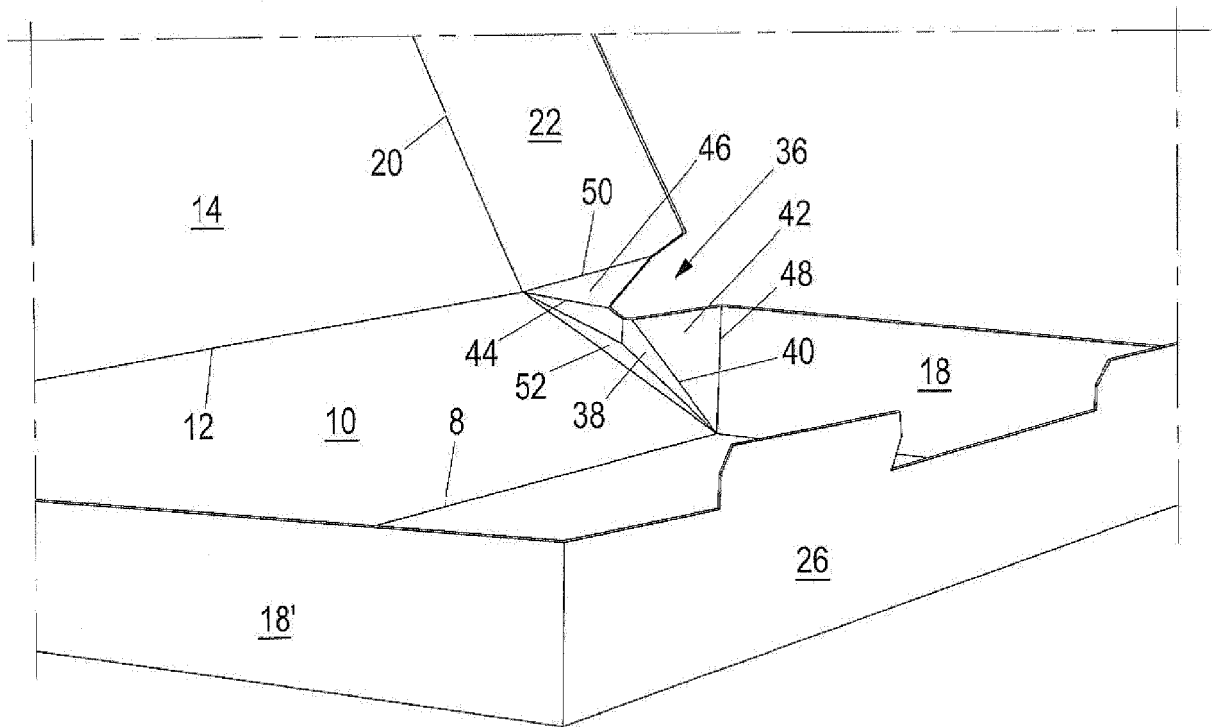


Fig. 4

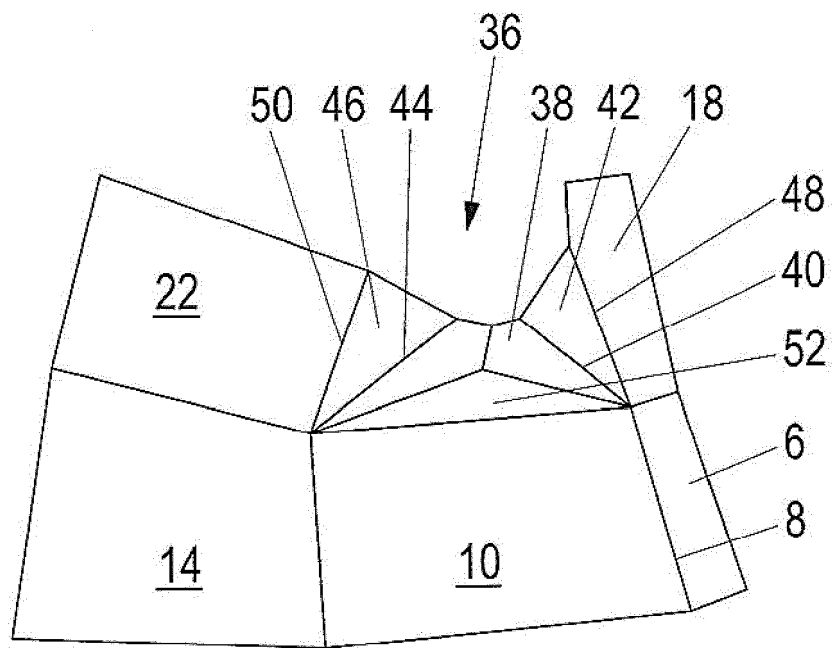


Fig. 5

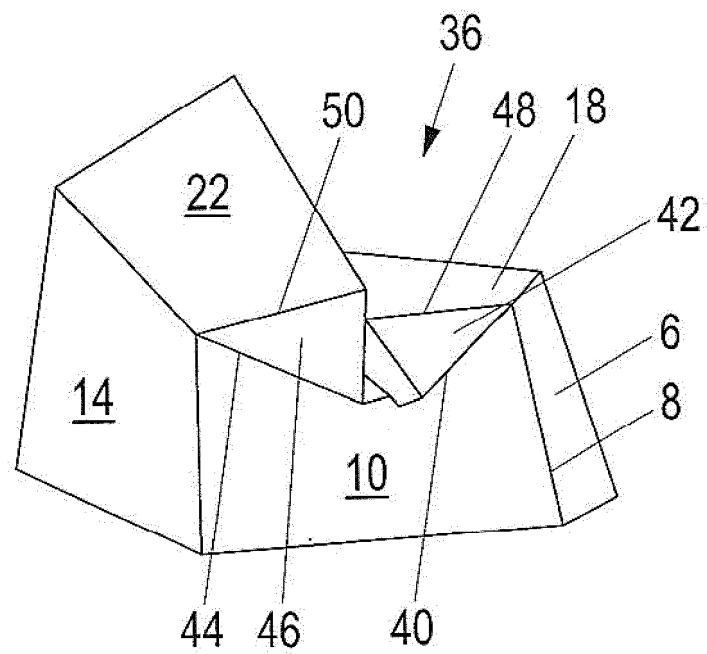


Fig. 6

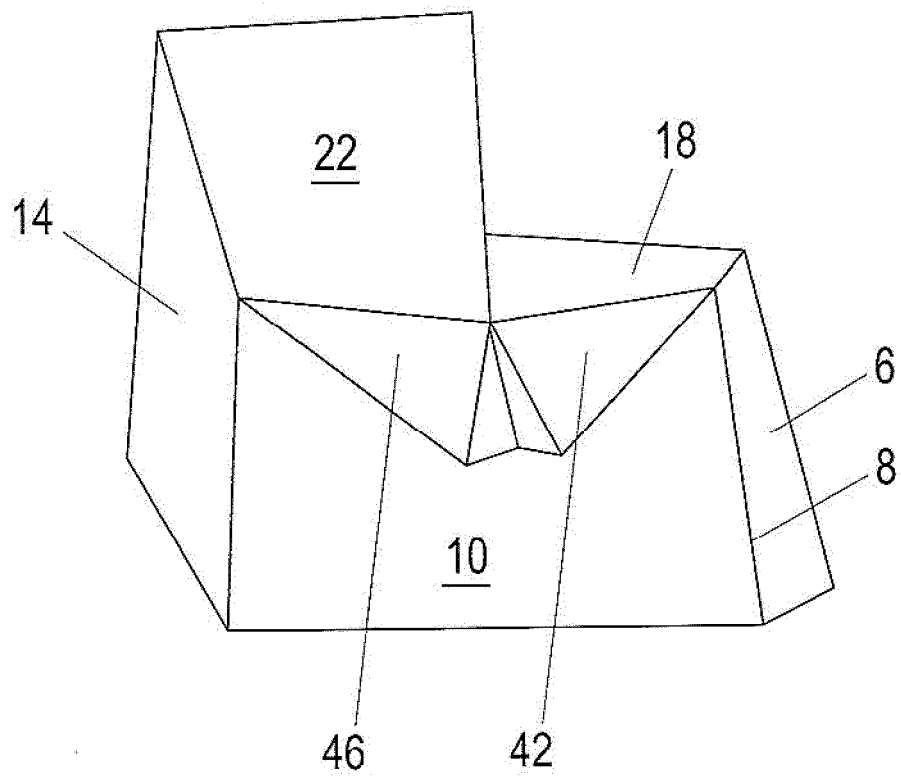


Fig. 7



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Application Number
EP 16 15 8352

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A	* column 4, line 63 - column 6, line 39; figures 1, 2, 5 * * column 7, line 2 - line 8 *	15,16	
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A	* page 2, paragraph 2; figures 1, 2 * * page 4, paragraph 3 - page 5, paragraph 1 * * page 6, paragraph 3 *	12,18	
A	US 2012/000972 A1 (LEARN ANGELA E [US]) 5 January 2012 (2012-01-05) * abstract; figures 1-6 *	1-21	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 June 2016	Examiner Czerny, M
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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