



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.11.2016 Bulletin 2016/47

(51) Int Cl.:
B65D 5/36 (2006.01) B65D 5/22 (2006.01)

(21) Application number: **15183237.5**

(22) Date of filing: **01.09.2015**

(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

(71) Applicant: **Glory Innovations, Inc.**
New Taipei City 24891 (TW)

(72) Inventor: **Liu, Kuo-Ching**
24891 New Taipei City (TW)

(74) Representative: **V.O.**
P.O. Box 87930
2508 DH Den Haag (NL)

(30) Priority: **21.05.2015 TW 104116242**

(54) **PACKAGE BOX**

(57) A package box includes a box body (2) and an outer panel (1). The box body (2) has a bottom panel (21) and two side panels (22) connected to the bottom panel (21). Each of the side panels (22) has two fold lines (25). The outer panel (1) has a main panel part (13), a pair of first side panel parts (14) connected to the main panel part (13), and a pair of second side panel parts (17) connected to the first panel parts (14). The package box is

convertible between an erected state where a receiving space is defined by the box body, where the first side panel parts (14) are attached the side panels (22), and where the second side panel parts (17) extend into the receiving space and are attached onto the side panels (22), and a flattened state where the side panels (22) are folded along the fold lines (25) to be laid flat on the bottom panel (21).

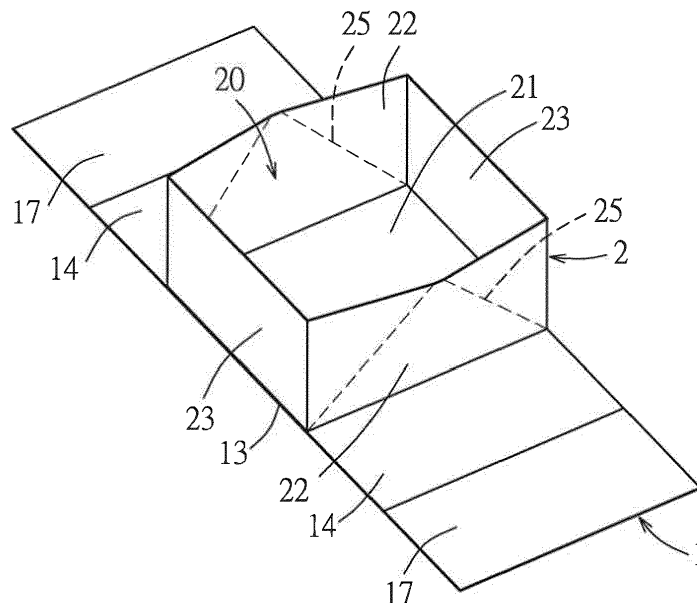


FIG.4

Description

[0001] The disclosure relates to a package box, more particularly to a package box that can be laid flat.

[0002] Conventional cardboard package boxes are produced by cutting a cardboard into a panel for facilitating transportation thereof, and then folding the panel into a package box during packing by utilizing fold lines formed thereon. However, the structural strength of the conventional package boxes may be compromised due to the very existence of the fold lines.

[0003] As such, as shown in Figures 1 and 2, another conventional package box 6 is disclosed to further include reinforcement panels 63 that can be attached respectively onto outer surfaces of side panels 63 of the conventional package box, on which fold lines 62 are correspondingly formed, when the conventional package box 6 is at an erected state (i.e., a state wherein the package box defines a receiving space for storage). However, the inclusion of the reinforcement panels 63 cannot prevent the side panels 61 of the conventional package box 6 from being bent along the fold lines 62 and inwardly toward a center of the conventional package box 6 under excessive pressure. As such, the overall supporting/structural strength of the conventional package box 6 is still not effectively enhanced.

[0004] Therefore, an object of the disclosure is to provide a package box that can alleviate the drawback of the prior art.

[0005] According to the disclosure, a package box may include a box body and a rectangular outer panel.

[0006] The box body has a bottom panel, two first side panels and two second side panels. The bottom panel has a pair of opposite first sides and a pair of opposite second sides. The first side panels are connected respectively to the first sides of the bottom panel. The second side panels are connected respectively to the second sides of the bottom panels. Each of the first side panels has a distal edge that is distal from a respective one of the first sides of the bottom panel, and two fold lines extending obliquely from the distal edge and extending respectively and symmetrically to opposite ends of the respective one of the first sides of the bottom panel.

[0007] The rectangular outer panel has a main panel part, a pair of first side panel parts and a pair of second side panel parts.

[0008] The main panel part is fixedly attached to and corresponds in shape and surface area to the bottom panel of the box body. The first side panel parts are respectively connected to two opposite sides of the main panel part. Each of the first side panel parts corresponds in shape and surface area to a respective one of the first side panels of the box body and has a distal edge that is distal from the main panel part. Each of the second side panel parts corresponds in shape and surface area to a respective one of the first side panel parts and is connected to the distal edge of the respective one of the first side panel parts. The package box is convertible between

an erected state where the first and second side panels of the box body are upright and perpendicular to the bottom panel to define a receiving space, where the first side panel parts of the rectangular outer panel are attached respectively onto outer surfaces of the first side panels of the box body, and where the second side panel parts extend into the receiving space and are attached respectively onto inner surfaces of the first side panels of the box body; and a flattened state where the rectangular outer panel is unfolded into a flat panel with the first and second side panel parts being detached from the first side panels of the box body, and where each of the first side panels of the box body is folded along the fold lines to allow the first and second side panels of the box body to be laid flat on the bottom panel of the box body.

[0009] Other features and advantages of the disclosure will become apparent in the following detailed description of the exemplary embodiments with reference to the accompanying drawings, of which:

Figure 1 is a perspective view illustrating a conventional package box;

Figure 2 is a perspective view of the conventional package box at an erected state;

Figure 3 is a perspective view of the conventional package box at a flattened state;

Figure 4 is a perspective view of a first exemplary embodiment of a package box according to the present disclosure, where a rectangular outer panel is laid flat;

Figure 5 is a partly-exploded perspective view of a first exemplary embodiment, illustrating that the package box may have a package cover;

Figure 6 is a perspective view of the first exemplary embodiment, illustrating the package cover covers an opening of a receiving space when the package box is at an erected state;

Figure 7 is a perspective view of the first exemplary embodiment, illustrating the package box is at a flattened state;

Figure 8 is a partly-exploded perspective view of a second exemplary embodiment of the package box according to the present disclosure, illustrating that the package cover is configured as a rectangular cover panel;

Figure 9 is a perspective view of the second exemplary embodiment, illustrating that the package cover and the rectangular outer panel are laid flat;

Figure 10 is a schematic sectional view of the second exemplary embodiment, illustrating the rectangular cover panel is connected to the rectangular outer panel;

Figure 11 is a schematic sectional view of the second exemplary embodiment, illustrating the package box is at the erected state with the rectangular cover panel covering the opening of the receiving space;

Figure 12 is a perspective view of the second exemplary embodiment, illustrating that the package box

is at the flattened state;

Figure 13 is a partly-exploded perspective view of a third exemplary embodiment of the package box according to the present disclosure;

Figure 14 is a perspective view of the third exemplary embodiment;

Figure 15 is a schematic sectional view of the third exemplary embodiment;

Figure 16 is a schematic sectional view of the third exemplary embodiment, illustrating that the package box is at the erected state;

Figure 17 is a perspective view of the package box is at the flattened state;

Figure 18 is a fragmentary schematic side view of the first exemplary embodiment, illustrating a connecting part of the rectangular outer panel interconnects a first side panel part and a second side panel part when the package box is at the flattened state; and

Figure 19 is a fragmentary schematic side view of the first exemplary embodiment, illustrating the connecting parts and the first and second side panel parts of the rectangular outer panel at the erected state.

[0010] Before the disclosure is described in greater detail, it should be noted that like elements are denoted by the same reference numerals throughout the disclosure.

[0011] Referring to Figures 4 to 7, the first exemplary embodiment of a package box according to the present disclosure is shown to include a rectangular outer panel 1 and a box body 2.

[0012] As shown in Figure 4, the box body 2 of the package box has a bottom panel 21, two first side panels 22 and two second side panels 23. The bottom panel 21 has a pair of opposite first sides and a pair of opposite second sides. The first side panels 22 are connected respectively to the first sides of the bottom panel 21, and the second side panels 23 are respectively connected to the second sides of the bottom panels 21. As shown in Figure 4, each of the first side panels 22 has a distal edge that is distal from a respective one of the first sides of the bottom panel 21, and two fold lines 25 extending obliquely from the distal edge and extending respectively and symmetrically to opposite ends of the respective one of the first sides of the bottom panel 21.

[0013] The rectangular outer panel 1 has a main panel part 13, a pair of first side panel parts 14 and a pair of second side panel parts 17.

[0014] The main panel part 13 is fixedly attached to and corresponds in shape and surface area to the bottom panel 21 of the box body 2. The first side panel parts 14 are respectively connected to two opposite sides of the main panel part 13. Each of the first side panel parts 14 corresponds in shape and surface area to a respective one of the first side panels 22 of the box body 2 and has a distal edge that is distal from the main panel part 21. Each of the second side panel parts 17 corresponds in

shape and surface area to a respective one of the first side panel parts 22 and is connected to the distal edge of the respective one of the first side panel parts 14. As shown in Figure 4, in this embodiment, the main panel part 13, the first and second side panel parts 14, 17 are configured as a series of interconnected rectangular panels with a plurality of parallel fold lines formed therebetween.

[0015] As shown in Figures 5 and 7, the package box is convertible between an erected state (see Figure 5) where the first and second side panels 22, 23 of the box body 2 are upright and perpendicular to the bottom panel 21 to define a receiving space, where the first side panel parts 14 of the rectangular outer panel 1 are attached respectively onto outer surfaces of the first side panels 22 of the box body 2, and where the second side panel parts 17 extend into the receiving space and are attached respectively onto inner surfaces of the first side panels 22 of the box body 2; and a flattened state (see Figure 7) where the rectangular outer panel 1 is unfolded into a flat panel with the first and second side panel parts 14, 17 being detached from the first side panels 22 of the box body 2, and where each of the first side panels 22 of the box body 2 is folded along the fold lines 25 to allow the first and second side panels 22, 23 of the box body 2 to be laid flat on the bottom panel 21 of the box body 2. By the attachment of the first and second side panel parts 14, 17 onto the inner and outer surfaces of the first side panels 22 of the box body 2 at the erected state, undesired folding of the first side panels 22 of the box body 2 along the fold lines 25 due to the pressure applied thereto may be effectively prevented, and the overall structural strength of the package box can be enhanced. Moreover, the rectangular outer panel 1 of the package box may remain flat when the package box is at the flattened state, so that transportation of the same is facilitated.

[0016] It should be noted that the package box according to the present disclosure may further include a package cover. For instance, as illustrated in Figures 5 and 6, the package cover 3 of the first exemplary embodiment may be configured as, but not being limited to, a separate cover piece to cover an opening 20 of the receiving space when the package box is at the erected state.

[0017] Referring to Figures 8 to 12, the second exemplary embodiment of the package box according to the present disclosure is similar to that of the first exemplary embodiment. The differences between the first and second exemplary embodiments reside in the following.

[0018] As shown in Figure 8, the package cover 4 of the second exemplary embodiment is configured as a rectangular cover panel having a cover panel segment 41 that corresponds in shape and surface area to the bottom panel 21 of the box body 2, and first and second side panel segments 42, 43 that are respectively connected to opposite ends of the cover panel segments 41 and that correspond in shape and surface area to the first side panel parts 14 of the rectangular outer panel 1.

As shown in Figure 10, the first side panel segment 42 is fixedly secured onto an outer surface of one of the first side panel parts 14 of the rectangular outer panel 1. The package cover 4 of this embodiment is foldable in a manner that the cover panel segment 41 covers the opening 20 of the receiving space and that the second side panel segment 43 is attached onto an outer surface of the other one of the first side panel parts 14 of the rectangular outer panel 1 when the package box is at the erected state as illustrated in Figure 11. When the package box is at the flattened state, the package cover 4 can be unfolded into a flat panel as illustrated in Figure 12. The package box of the second exemplary embodiment has advantages similar to those of the first exemplary embodiment.

[0019] Referring to Figures 13 to 17, the third exemplary embodiment of the package box according to the present disclosure is shown to be similar to that of the second exemplary embodiment, the differences between the second and third embodiments reside in the following.

[0020] As shown in Figure 13, the package cover 5 of the third exemplary embodiment is also configured as a rectangular cover panel 5 having a cover panel segment 52, first, second and third side panel segments 53, 55, 54 and a bottom panel segment 51. The cover panel segment 52 corresponds in shape and surface area to the bottom panel 21 of the box body 2. The first and second side panel segments 53, 55 are respectively connected to opposite ends of the cover panel segment 52 and correspond in shape and surface area to the first side panel parts 14 of the rectangular outer panel 1. The first side panel segment 53 is fixedly secured onto an outer surface of one of the first side panel parts 14 of the rectangular outer panel 1. The bottom panel segment 51 is connected to the first side panel segment 53 opposite to the cover panel segment 52 and is fixedly secured onto an outer surface of the main panel part 13 of the rectangular outer panel 1. The third side panel segment 54 is connected to the bottom panel segment 51 of the rectangular cover panel 5 opposite to the first side panel segment 53, corresponds in shape and surface area to the first side panel parts 14, and is fixedly secured onto an outer surface of the other one of the first side panel parts 14 of the rectangular outer panel 1. As illustrated in Figure 16, the package cover 5 of the third exemplary embodiment is foldable in a manner that the cover panel segment 52 covers the opening 20 of the receiving space and that the second side panel segment 55 is attached onto an outer surface of the third side panel segment 54 to cover the other one of the first side panel parts 14 of the rectangular outer panel 1 when the package box is at the erected state. When the package box of the third exemplary embodiment is at the flattened state, the rectangular cover panel 5 can be unfolded into a flat panel as illustrated in Figure 17. The package box of the third exemplary embodiment has advantages similar to those of the second exemplary embodiment.

[0021] It is worth noting that, when the rectangular outer panel 1 of either one of the aforesaid exemplary em-

bodiments (e.g., the first exemplary embodiment as shown in Figures 18 and 19) is relatively thick, the rectangular outer panel 1 may further have a plurality of connecting parts 18, each of which is sandwiched by two parallel fold lines 19 and interconnects a respective one of the second side panel parts 17 and the distal edge of the respective one of the first side panel parts 14 of the rectangular outer panel 1. The inclusion of the connecting parts 18 may allow the first and second side panel parts 14, 17 to be more fittingly attached onto the inner and outer surfaces of the first side panels 22 of the box body 2 (as illustrated in Figure 19) when the package box is at the erected state, which results in a relatively smooth appearance of the package box.

[0022] To sum up, by the attachment of the first and second side panel parts 14, 17 onto the inner and outer surfaces of the first side panels 22 of the box body 2 at the erected state, undesired folding of the first side panels 22 of the box body 2 along the fold lines 25 due to pressure applied on the package box may be effectively prevented, and the overall structural strength of the package box may be enhanced. Moreover, the rectangular outer panel 1 of the package box can remain flat when the package box is at the flattened state so that transportation of the same is facilitated.

Claims

1. A package box including:

a box body (2) having a bottom panel (21) that has a pair of opposite first sides and a pair of opposite second sides, two first side panels (22) that are connected respectively to said first sides of said bottom panel (21), and two second side panels (23) that are respectively connected to said second sides of said bottom panel (21) and that interconnect said first side panels (22), each of said first side panels (22) having a distal edge that is distal from a respective one of said first sides of said bottom panel (21), and two fold lines (25) extending obliquely from said distal edge and extending respectively and symmetrically to opposite ends of the respective one of said first sides of said bottom panel (21); and a rectangular outer panel (1) having a main panel part (13) that is fixedly attached to and corresponds in shape and surface area to said bottom panel (21) of said box body (2), and a pair of first side panel parts (14) that are respectively connected to two opposite sides of said main panel part (13), each of said first side panel parts (14) corresponding in shape and surface area to a respective one of said first side panels (22) of said box body (2) and having a distal edge that is distal from said main panel part (13), characterized in that said rectangular outer panel (1)

further has a pair of second side panel parts (17) each of which corresponds in shape and surface area to a respective one of said first side panel parts (14) and is connected to said distal edge of the respective one of said first side panel parts (14), and that said package box is convertible between an erected state, where said first and second side panels (22, 23) of said box body (2) are upright and perpendicular to said bottom panel (21) of said box body (2) to define a receiving space, where said first side panel parts (14) of said rectangular outer panel (1) are attached respectively onto outer surfaces of said first side panels (22) of said box body (2), and where said second side panel parts (17) extend into said receiving space and are attached respectively onto inner surfaces of said first side panels (22) of said box body (2), and a flattened state, where said rectangular outer panel (1) is unfolded into a flat panel with said first and second side panel parts (14, 17) being detached from said first side panels (22) of said box body (2), and where each of said first side panels (22) of said box body (2) is folded along said fold lines (25) to allow said first and second side panels (22, 23) of said box body (2) to be laid flat on said bottom panel (21) of said box body (2).

2. The package box according to Claim 1, further **characterized by** a package cover (3, 4, 5) to cover an opening (20) of the receiving space when said package box is at the erected state.

3. The package box according to Claim 2, further **characterized in that:**

said package cover (4) is configured as a rectangular cover panel having a cover panel segment (41) that corresponds in shape and surface area to said bottom panel (21) of said box body (2), and first and second side panel segments (42, 43) that are respectively connected to opposite ends of said cover panel segment (41) and that correspond in shape and surface area to said first side panel parts (14) of said rectangular outer panel (1), said first side panel segment (42) being fixedly secured onto an outer surface of one of said first side panel parts (14) of said rectangular outer panel (1); and said package cover (4) is foldable in a manner that said cover panel segment (41) covers said opening (20) of said receiving space and that said second side panel segment (43) is attached onto an outer surface of the other one of said first side panel parts (14) of said rectangular outer panel (1) when said package box is at the erected state.

4. The package box according to Claim 2, further **characterized in that:**

said package cover (5) is configured as a rectangular cover panel having

a cover panel segment (52) that corresponds in shape and surface area to said bottom panel (21) of said box body (2), first and second side panel segments (53, 55) that are respectively connected to opposite ends of said cover panel segment (52) and that correspond in shape and surface area to said first side panel parts (14) of said rectangular outer panel (1), said first side panel segment (53) being fixedly secured onto an outer surface of one of said first side panel parts (14) of said rectangular outer panel (1),

a bottom panel segment (51) that is connected to said first side panel segment (53) opposite to said cover panel segment (52) and that is fixedly secured onto an outer surface of said main panel part (13) of said rectangular outer panel (1), and

a third side panel segment (54) that is connected to said bottom panel segment (51) of said rectangular cover panel (5) opposite to said first side panel segment (53), that corresponds in shape and surface area to said first side panel parts (14) of said rectangular outer panel (1), and that is fixedly secured onto an outer surface of the other one of said first side panel parts (14); and

said package cover (5) is foldable in a manner that said cover panel segment (52) covers said opening (20) of said receiving space and that said second side panel segment (55) is attached onto an outer surface of said third side panel segment (54) to cover the other one of said first side panel parts (14) of said rectangular outer panel (1) when said package box is at the erected state.

5. The package box according to any one of Claims 1 to 4, further **characterized in that** said rectangular outer panel (1) further has a pair of connecting parts (18), each of which interconnects a respective one of said second side panel parts (17) and said distal edge of the respective one of said first side panel parts (14) of said rectangular outer panel (1).

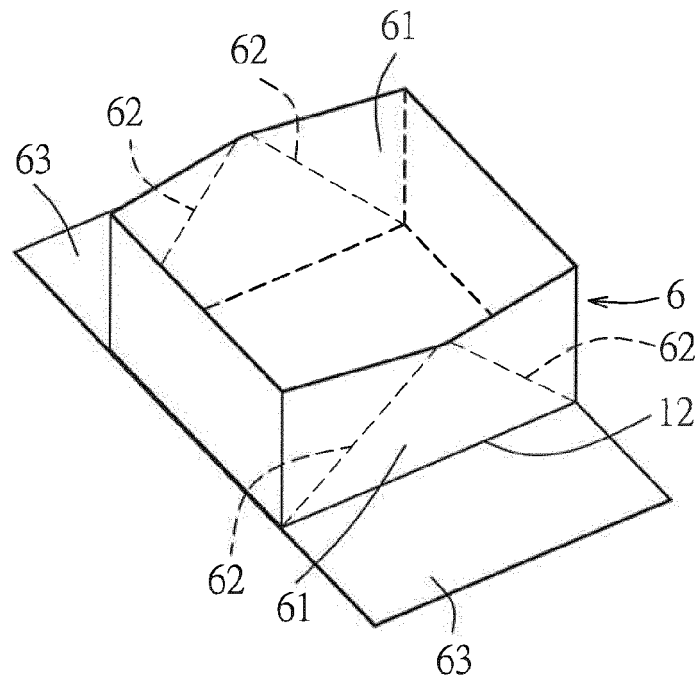


FIG.1
PRIOR ART

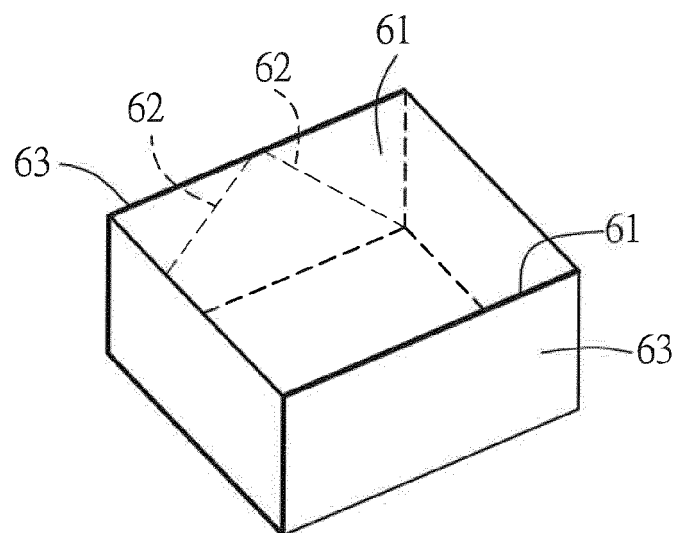


FIG.2
PRIOR ART

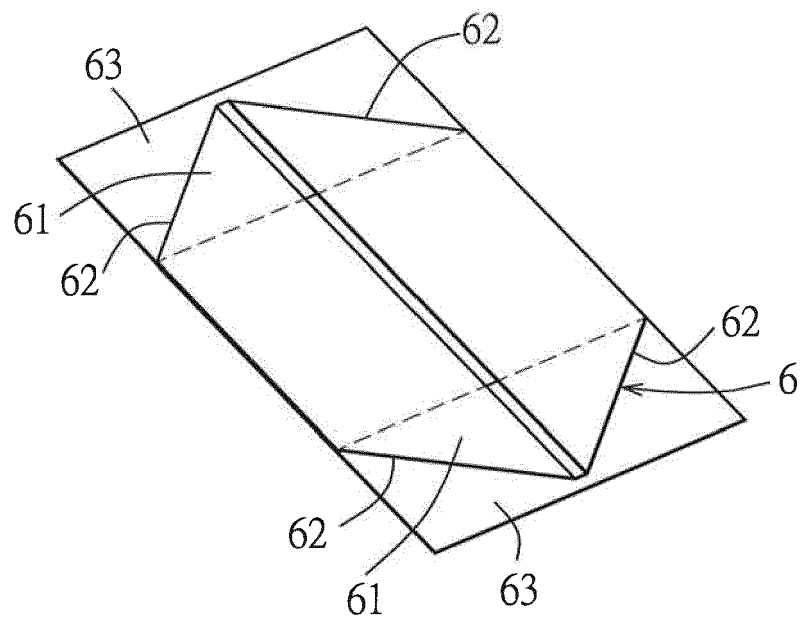


FIG.3
PRIOR ART

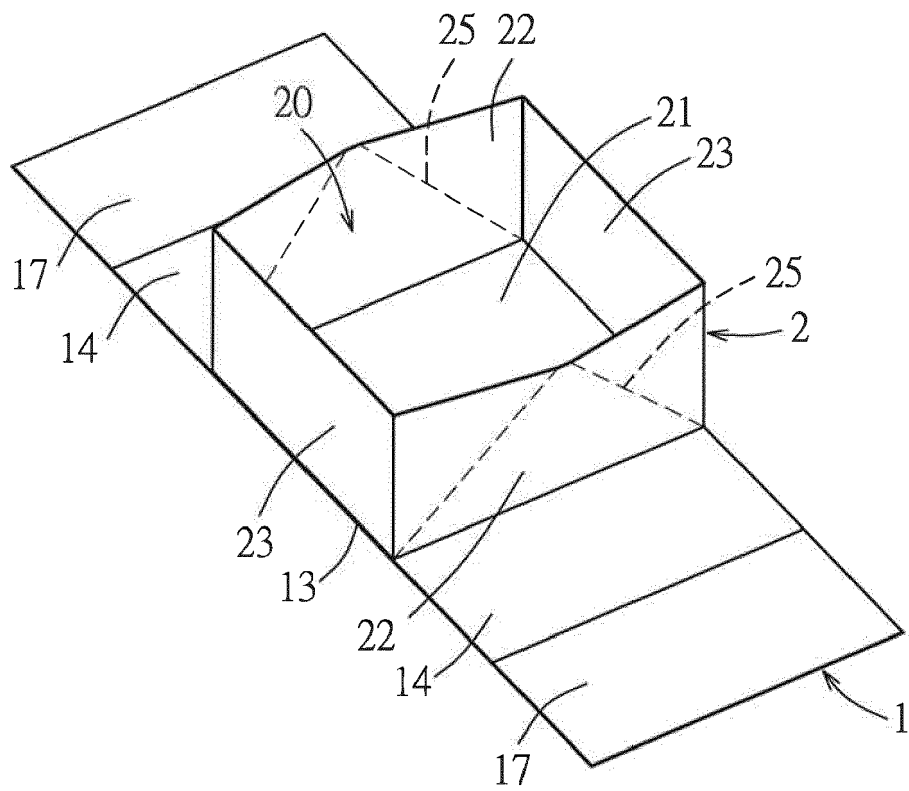


FIG.4

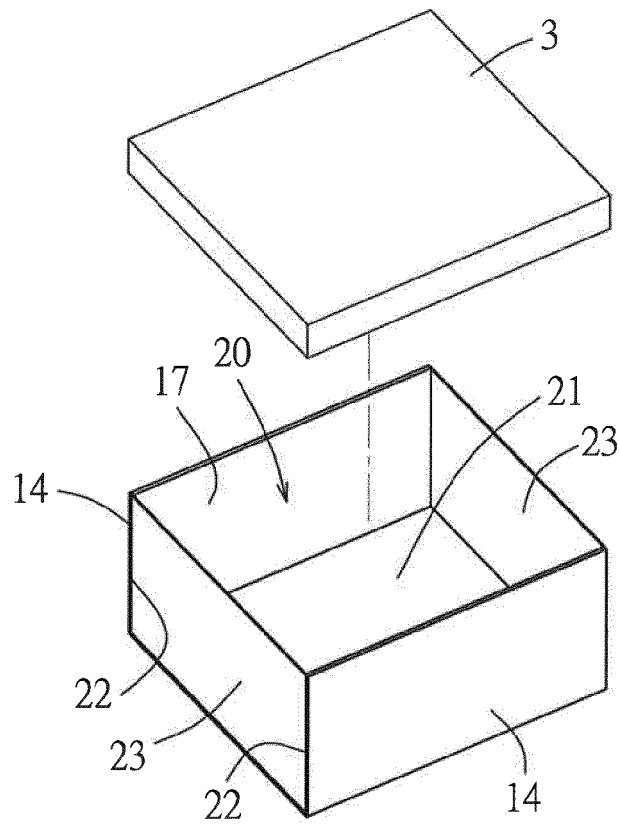


FIG.5

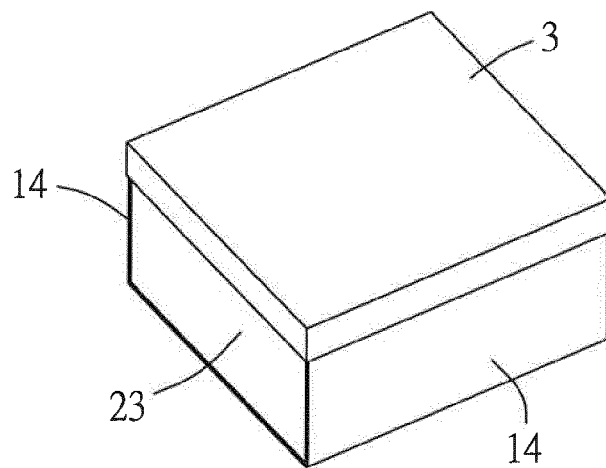


FIG.6

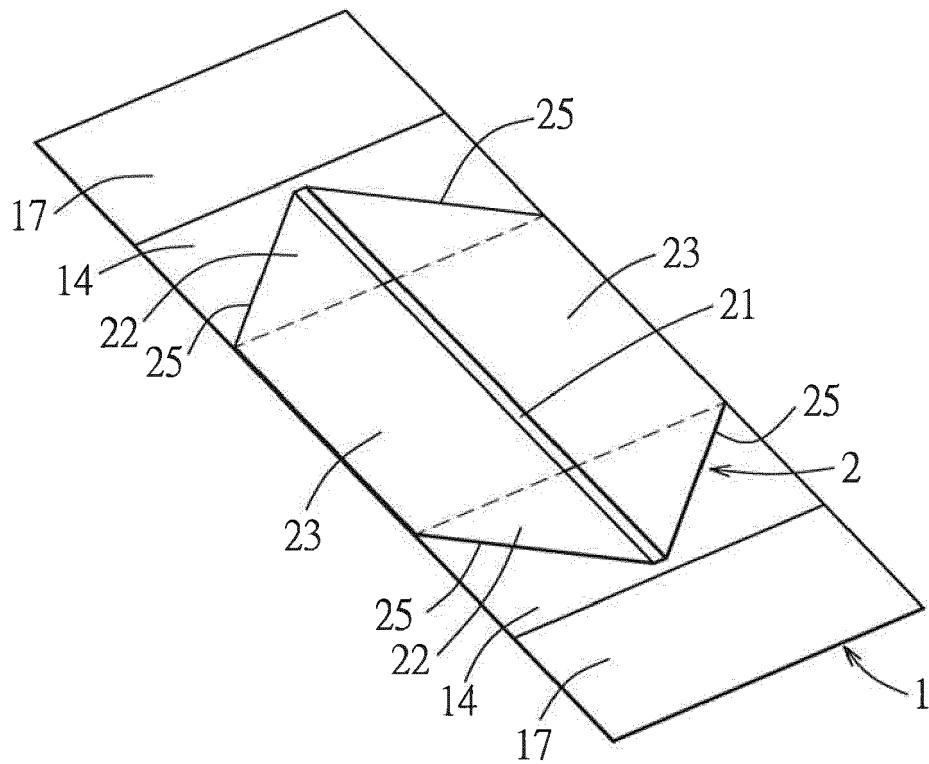


FIG.7

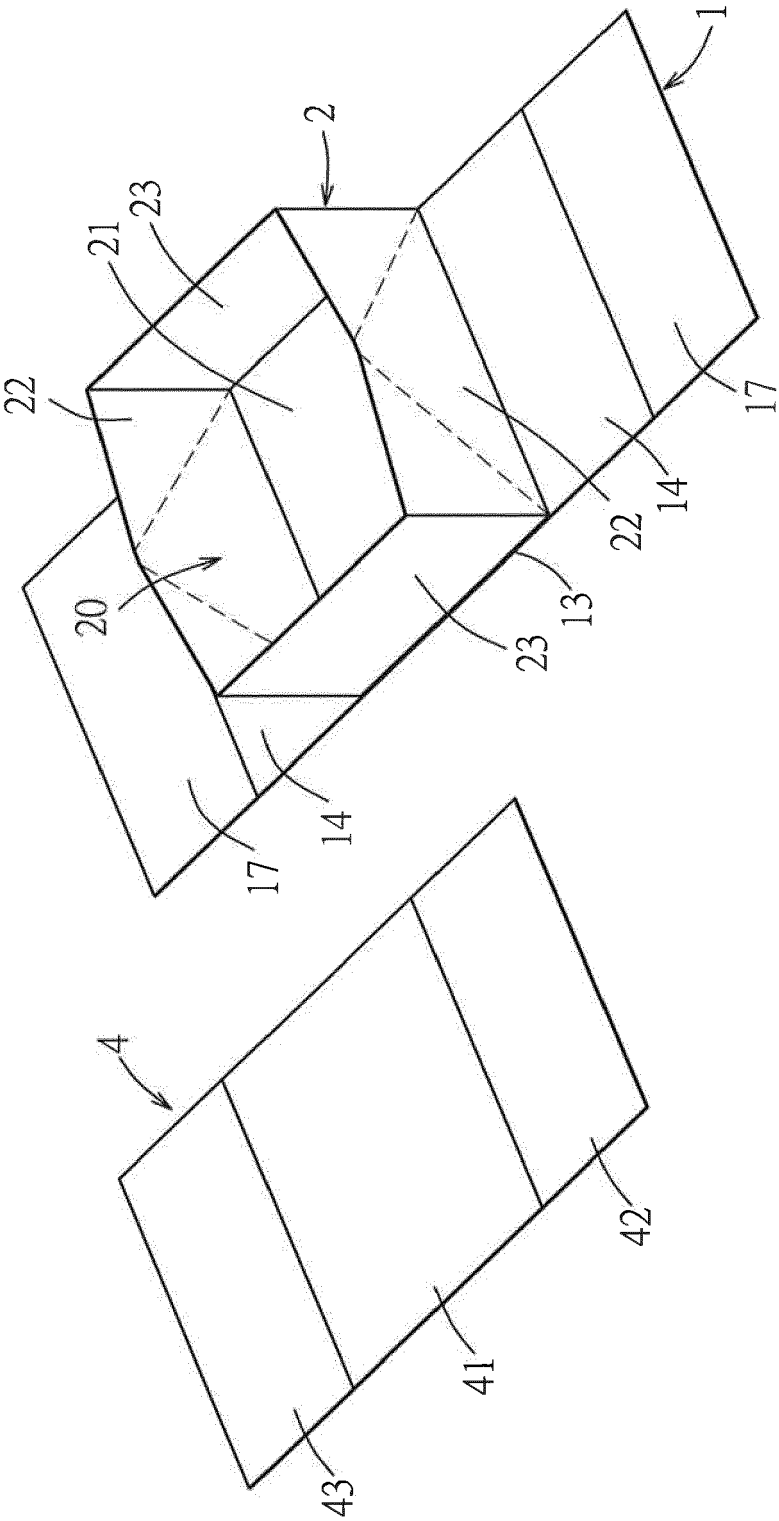


FIG.8

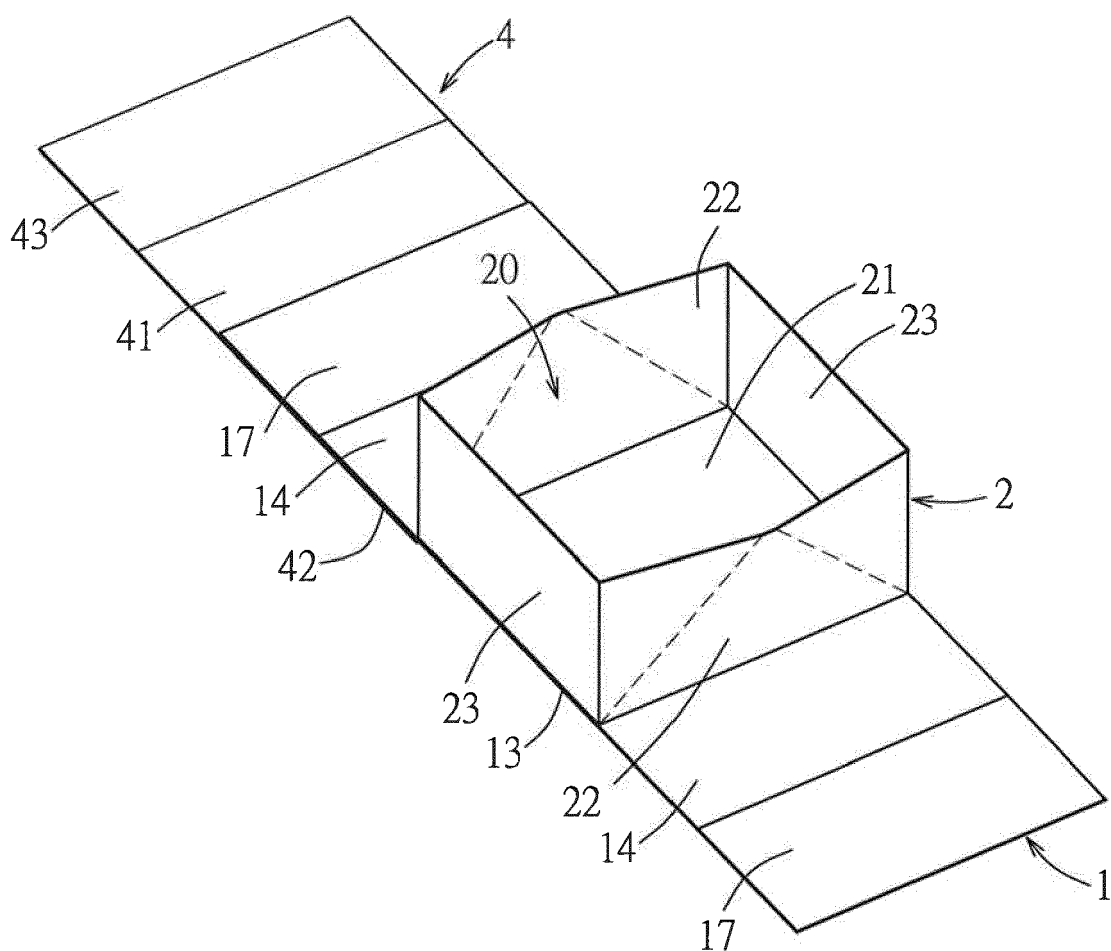


FIG.9

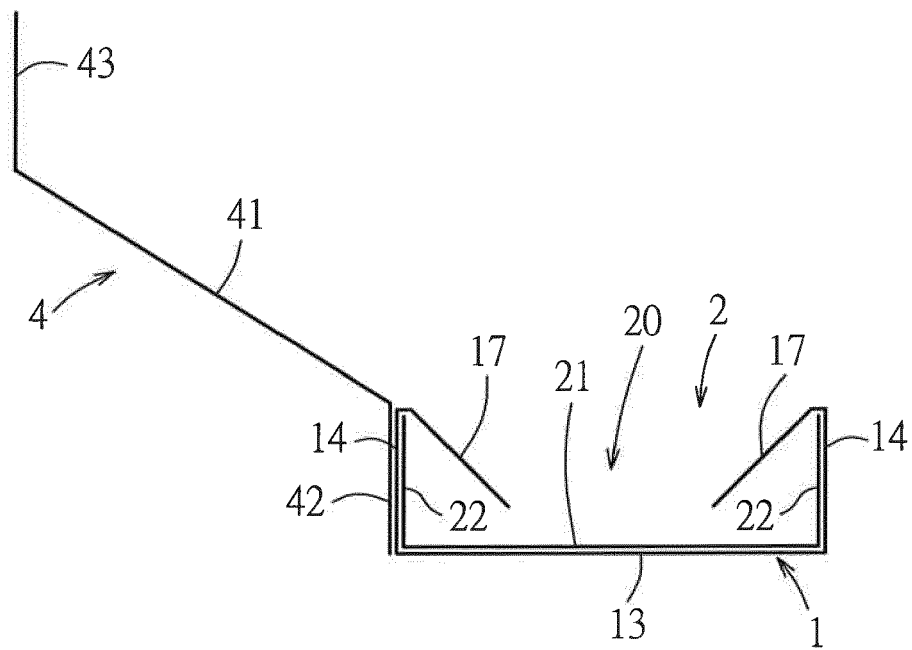


FIG. 10

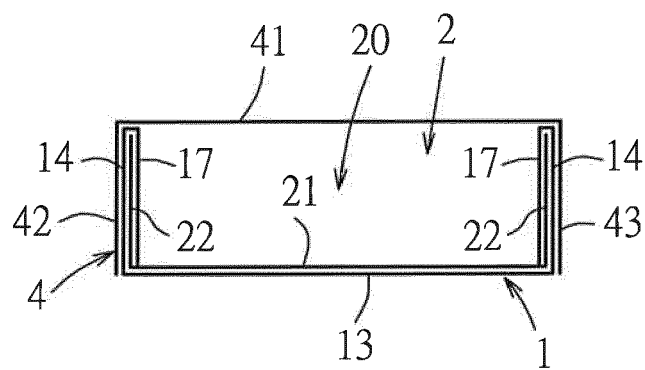


FIG. 11

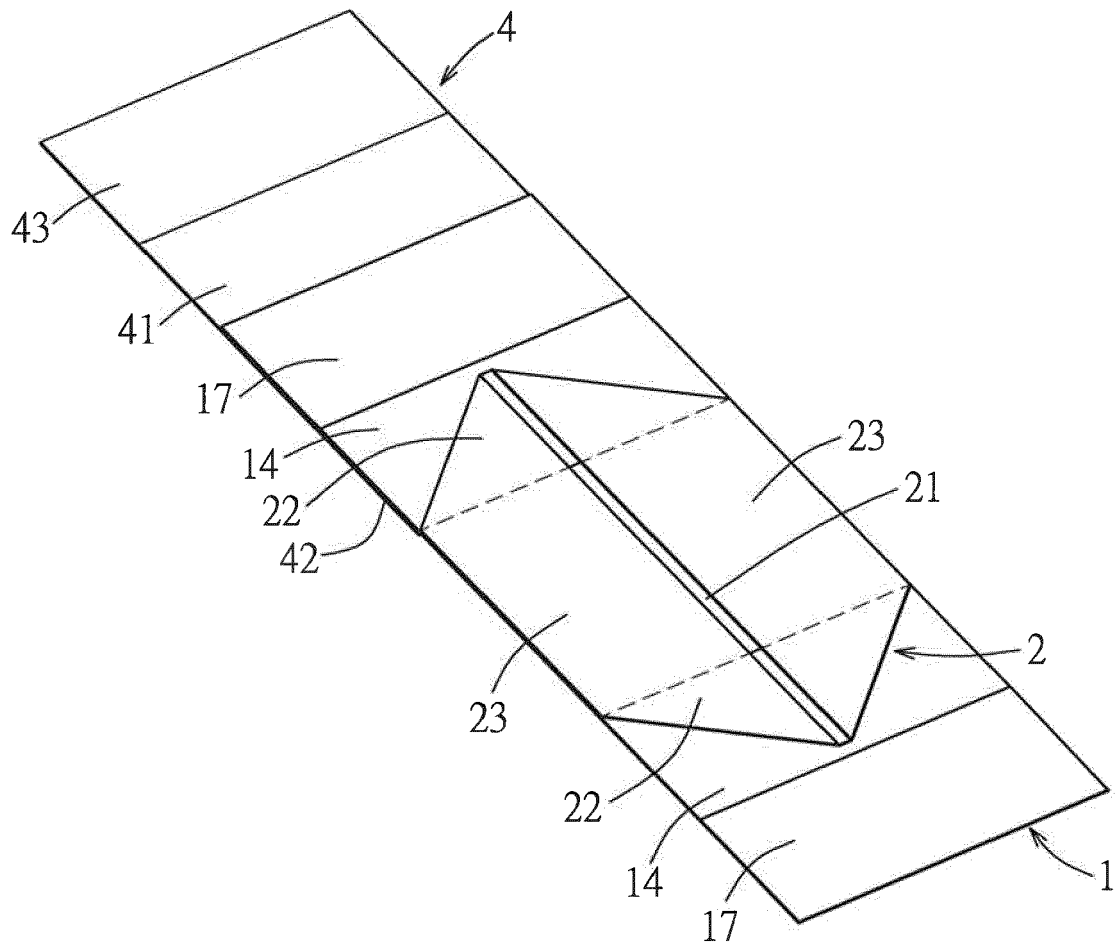


FIG.12

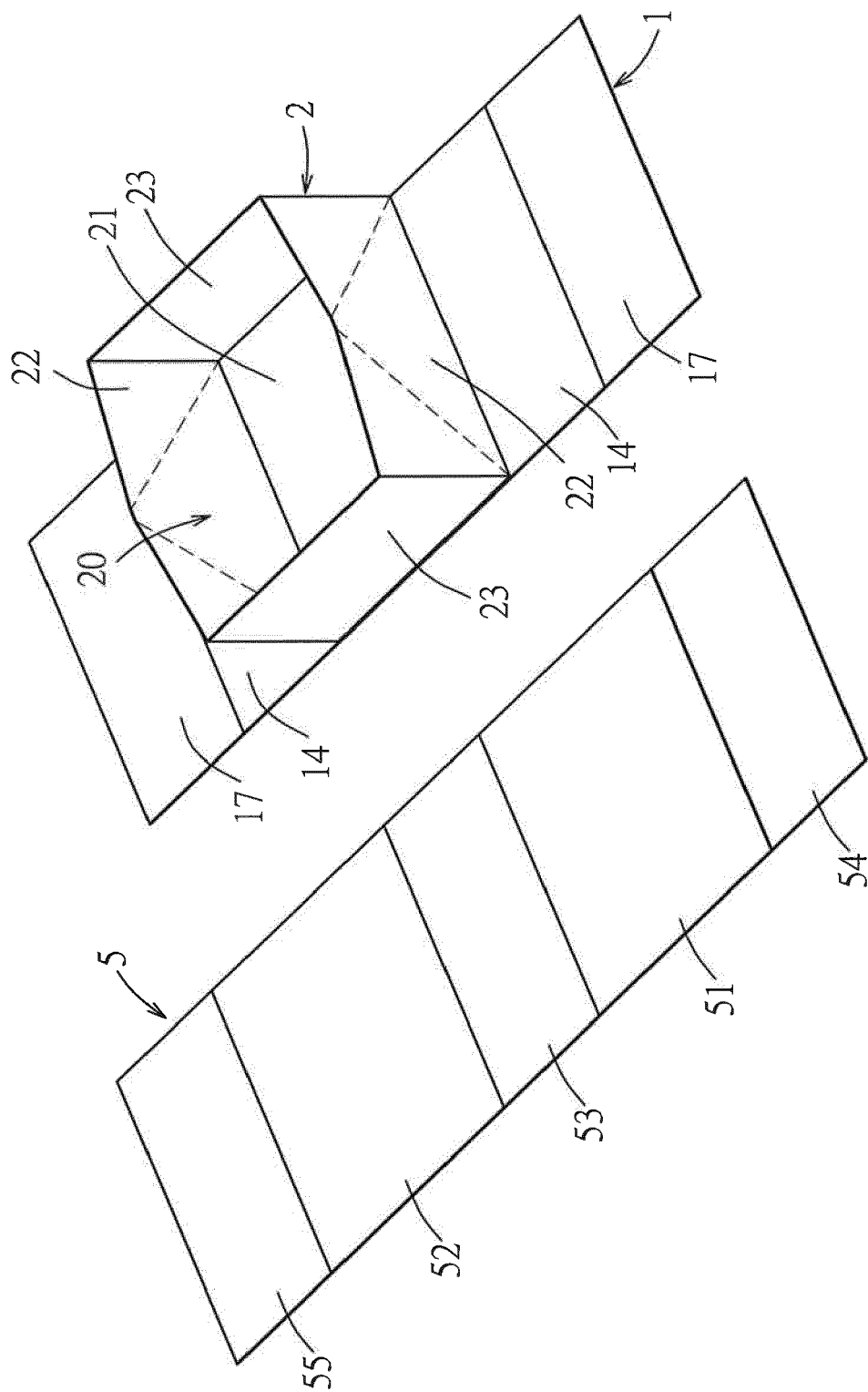


FIG.13

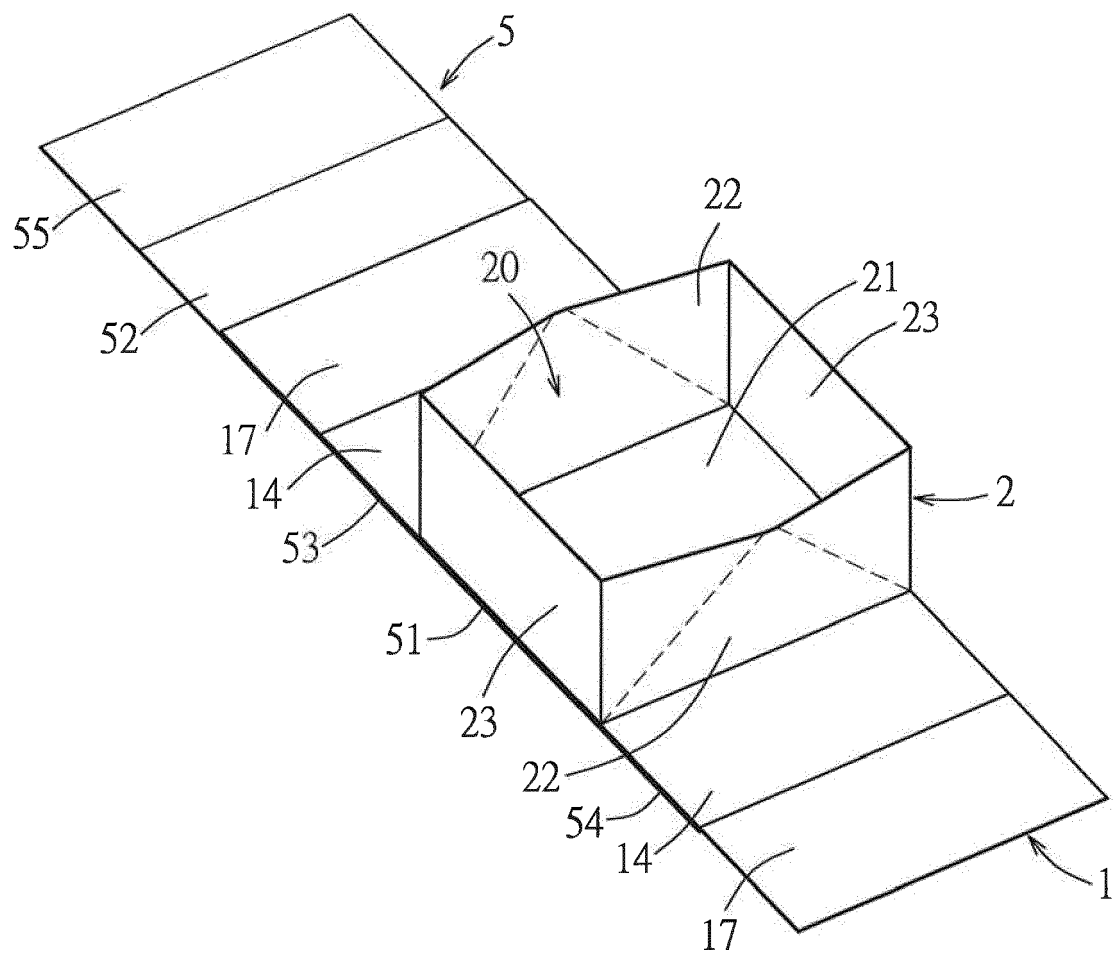


FIG.14

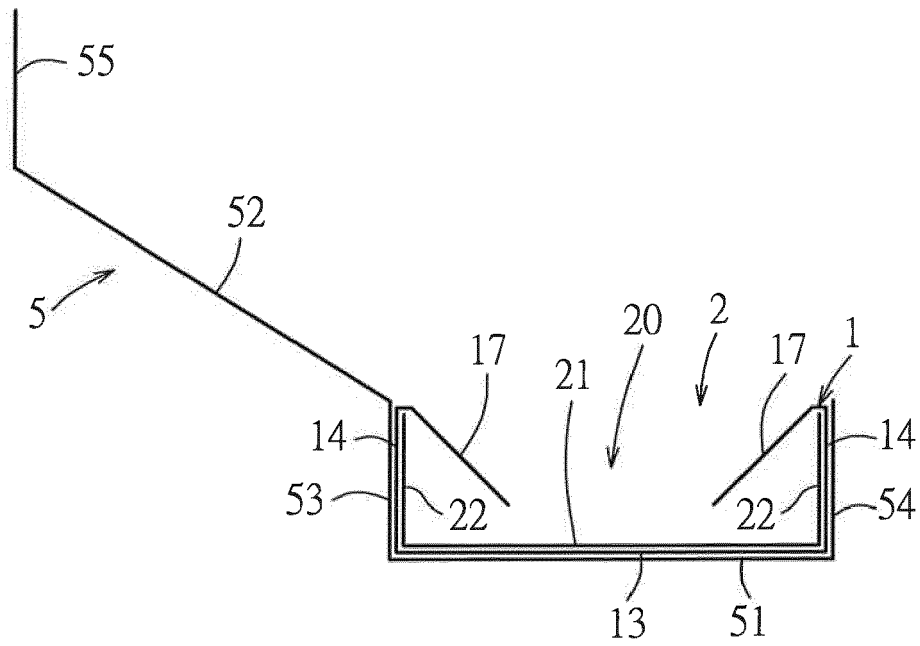


FIG.15

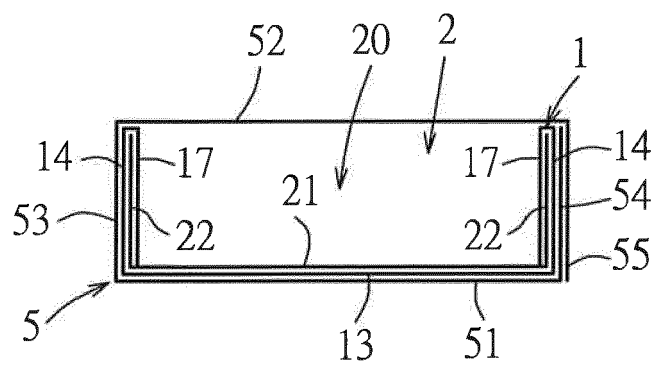


FIG.16

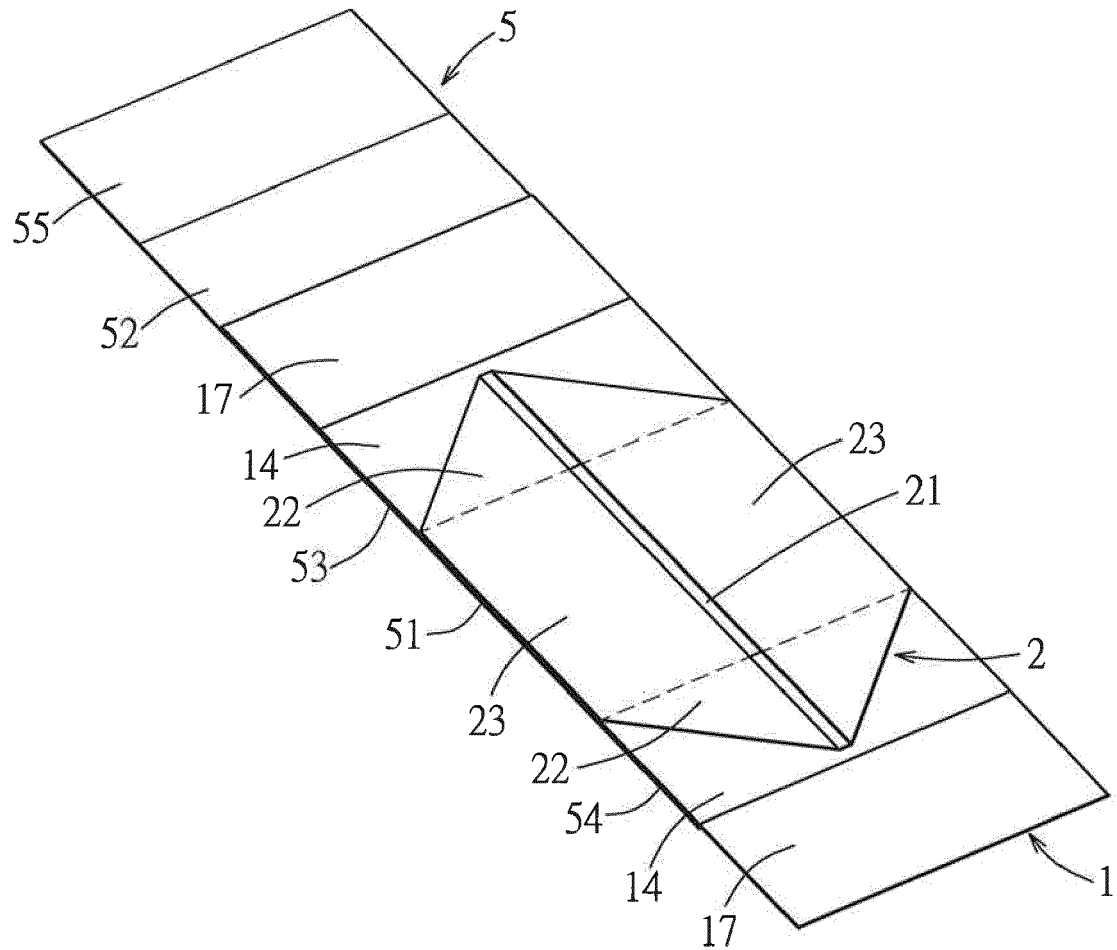


FIG.17

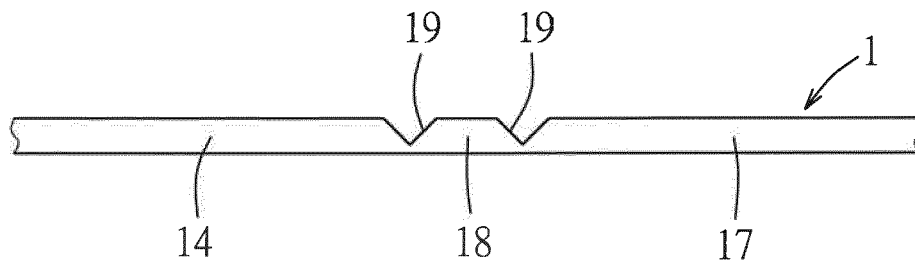


FIG.18

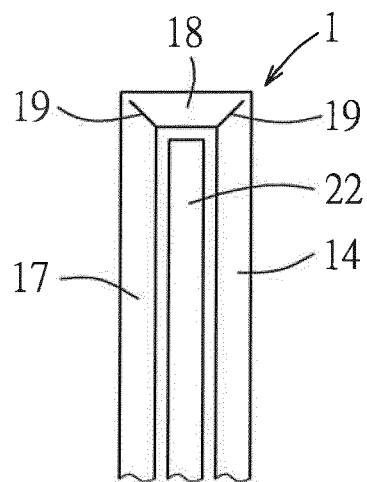


FIG.19



EUROPEAN SEARCH REPORT

 Application Number
 EP 15 18 3237

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 930 953 A (FREUND SAMUEL [US]) 10 August 1909 (1909-08-10) * the whole document *	1-5	INV. B65D5/36 B65D5/22
A	US 2014/339227 A1 (CHALIFOUX PAUL [US]) 20 November 2014 (2014-11-20) * paragraph [0066] - paragraph [0076]; claims 1-21; figures 4-22 *	1-5	
A	US 2007/221716 A1 (TAO JIAN [CN]) 27 September 2007 (2007-09-27) * paragraph [0014] - paragraph [0031]; claims 10-20; figures 1-8 *	1-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 September 2016	Examiner Janosch, Joachim
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			

 1
 EPO FORM 1503 03.02 (P04C01)

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

EP 15 18 3237

5 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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-09-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 930953 A	10-08-1909	NONE	
US 2014339227 A1	20-11-2014	NONE	
US 2007221716 A1	27-09-2007	CN 2875956 Y US 2007221716 A1	07-03-2007 27-09-2007

EPO FORM P0459

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