(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 289 759 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.12.2023 Bulletin 2023/50

(21) Application number: **23173786.7**

(22) Date of filing: **16.05.2023**

(51) International Patent Classification (IPC):
B65D 27/00 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B65D 27/00; B65D 2301/10

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(30) Priority: **16.05.2022 GB 202207086**

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(54) **PACKAGING ENVELOPE**

(57) A sheet of packaging envelope substrate having formed thereon a plurality of blanks for packaging envelopes, each blank comprising: a front panel; a rear panel foldably connected to the front panel; and a pair of glue flaps, each foldably connected to one of the front panel or the rear panel, wherein, when the rear panel is folded onto the front panel, each glue flap is foldable onto the front panel or the rear panel to which it is not foldably connected to retain that front panel or rear panel in place, wherein a first blank of the plurality of blanks comprises a rear glue flap foldably connected to the rear panel thereof, and a second blank of the plurality of blanks comprises a front glue flap foldably connected to the front panel thereof, and wherein the first and second blanks are positioned adjacent to each other on the sheet such that the front and rear glue flaps interlock.

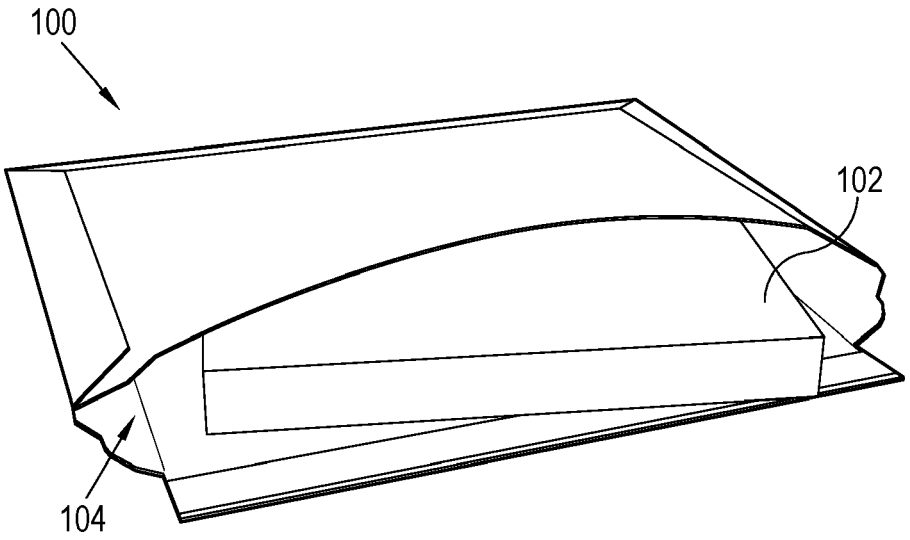

Fig. 1

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Description

Technical field

[0001] The invention relates to blanks for packaging envelopes, packaging envelopes formed from such blanks and associated methods. In specific arrangements, the invention may relate to a plurality of interlocking blanks arranged on a sheet or roll of packaging envelope substrate, which may be a paper based substrate such as card.

Background

[0002] Packaging envelopes are used extensively for delivery of items purchased online. There are a number of designs of packaging envelope, one of which is the gusseted envelope.

[0003] Figure 1 shows a known gusseted envelope 100, examples of which are typically manufactured from a paper-based substrate such as card that has a minimum stiffness to afford protection to an item 102 to be delivered.

[0004] Figure 2 shows a blank 200 of the gusseted envelope 100 from Figure 1. The blank 200 includes a front panel 202, a rear panel 204, opposed glue flaps 206, 207 and a closure flap 208. The opposed glue flaps 206, 207 and the closure flap 208 extend from edges of the front panel 202. Specifically, the opposed glue flaps 206, 207 extend from opposite side edges of the front panel 202. The gusseted envelope 100 is formed from the blank 200 by folding the rear panel 204 to overlap the front panel 202, applying an adhesive to the glue flaps 206, 207 and folding the glue flaps 206, 207 over the rear panel 204 to hold it in place.

[0005] The process of forming the gusseted envelope 100 from the blank 200 is typically undertaken on an automated production line.

[0006] Referring back to Figure 1, there is an opening 104 in the gusseted envelope 100. A distribution plant worker places the item 102 into the opening 104 before sealing the opening 104 with the closure flap 208. The stiffness of the paper based substrate means that impacts along the edges of the envelope 100 do not damage the item 102 during transit and delivery.

[0007] The blank 200 is typically formed along with a number of other blanks on a sheet of paper based substrate. The blanks are defined by creating fold lines in the paper based substrate and cutting each blank from the sheet. This results in some offcut wastage of substrate material. It is desirable to reduce the amount of offcut wasted paper based substrate during manufacture of the gusseted envelope 100.

Summary

[0008] Methods and apparatus disclosed herein are directed to solving one or more problems in the prior art, including those disclosed herein.

[0009] According to an aspect of the invention, there is provided a sheet of packaging envelope substrate having formed thereon a plurality of blanks for packaging envelopes, each blank comprising: a front panel; a rear panel foldably connected to the front panel; and a pair of glue flaps, each foldably connected to one of the front panel or the rear panel, wherein, when the rear panel is folded onto the front panel, each glue flap is foldable onto the front panel or the rear panel to which it is not foldably connected to retain that front panel or rear panel in place, wherein a first blank of the plurality of blanks comprises a rear glue flap foldably connected to the rear panel thereof, and a second blank of the plurality of blanks comprises a front glue flap foldably connected to the front panel thereof, and wherein the first and second blanks are positioned adjacent to each other on the sheet such that the front and rear glue flaps interlock.

[0010] Optionally, the first blank further comprises a front glue flap foldably connected to the front panel thereof.

[0011] Optionally, the second blank further comprises a rear glue flap foldably connected to the rear panel thereof.

[0012] Optionally, the first blank comprises a further rear glue flap foldably connected to the rear panel thereof.

[0013] Optionally, the second blank comprises a further front glue flap foldably connected to the front panel thereof.

[0014] Optionally, the first blank and the second blank comprise a closure flap foldably connected to the front panels thereof.

[0015] Optionally, one or more cut lines separate a glue flap of the first blank from a front or rear panel of the second blank, and/or wherein one or more cut lines separate a glue flap of the second blank from a front or rear panel of the first blank.

[0016] Optionally, a corner of each glue flap that is proximal to the foldable connection of the front panel to the rear panel is chamfered.

[0017] Optionally, the packaging envelope formed from each blank has an oblong shape, and wherein the front panel is foldably connected to the rear panel at a short edge of the packaging envelope.

[0018] Optionally, the packaging envelope substrate is a paper based substrate.

[0019] According to an aspect of the invention, there is provided a packaging envelope formed from a blank taken from a sheet of packaging envelope substrate according to any of claims 1-10.

[0020] According to an aspect of the invention, there is provided a method of forming a plurality of blanks on a sheet of packaging envelope substrate, comprising: forming a plurality of fold lines and/or cut lines on the sheet for defining the plurality of blanks, wherein each blank comprises: a front panel; a rear panel foldably connected to the front panel; and a pair of glue flaps, each foldably connected to one of the front panel or the rear

panel, wherein, when the rear panel is folded onto the front panel, each glue flap is foldable onto the front panel or the rear panel to which it is not foldably connected to retain that front panel or rear panel in place, wherein a first blank of the plurality of blanks comprises a rear glue flap foldably connected to the rear panel thereof, and a second blank of the plurality of blanks comprises a front glue flap foldably connected to the front panel thereof, and wherein the first and second blanks are positioned adjacent to each other on the sheet such that the front and rear glue flaps interlock.

[0021] According to an aspect of the invention, there is provided a blank for a packaging envelope, comprising: a front panel; a rear panel foldably connected to the front panel; a first glue flap foldably connected to the front panel such that, when the rear panel is folded onto the front panel, the first glue flap may be folded onto the rear panel; and a second glue flap foldably connected to the rear panel such that, when the rear panel is folded onto the front panel, the second glue flap may be folded onto the front panel.

[0022] According to an aspect of the invention, there is provided a method of forming a packaging envelope from a blank, the blank comprising a front panel, a rear panel foldably connected to the front panel, a first glue flap foldably connected to the front panel, and a second glue flap foldably connected to the rear panel, the method comprising: folding the rear panel onto the front panel; applying an adhesive to the first glue flap; folding the first glue flap onto the rear panel; applying an adhesive to the second glue flap; and folding the second glue flap onto the front panel.

Brief description of the drawings

[0023] Embodiments of the disclosed methods and apparatus will be described in detail below, with reference to the accompanying drawings, in which:

Figure 1 is an image of a gusseted envelope;
Figure 2 is an image of a blank for a gusseted envelope;
Figure 3 is a schematic representation of a plurality of blanks arranged on a sheet of paper based substrate;
Figure 4 is a schematic representation of a blank for a packaging envelope;
Figure 5 is a schematic representation of a plurality of blanks arranged on a sheet of packaging envelope substrate;
Figure 6 is an image of a packaging envelope formed from a blank;
Figure 7 is a flow diagram of a method of forming a plurality of blanks on a sheet of packaging envelope substrate;
Figure 8 is a flow diagram of a method of forming a packaging envelope from a blank.

Detailed Description

[0024] Generally, disclosed herein are blanks of packaging envelopes, methods of preparing packaging envelopes, and packaging envelopes themselves. The packaging envelopes are, in some arrangements, gusseted envelopes. The disclosed blanks are configured to be arranged together on a sheet or roll of packaging envelope substrate such that offcut wastage is reduced, allowing a higher yield from the raw materials used in packaging envelope construction. In all examples disclosed herein, the packaging envelope substrate may be a paper based substrate, such as card.

[0025] Figure 3 shows a known arrangement of blanks 300a-d for packaging envelopes on a sheet 302 of packaging envelope substrate. The blanks 300a-d may be examples of the blank 200 of Figure 2 and the same or similar reference numerals are used when describing the blanks 300a-d of Figure 3.

[0026] As can be seen in Figure 3, a first blank 300a includes a front panel 202a, a rear panel 204a, opposed glue flaps 206a, 207a and a closure flap 208a. Similarly, a second blank 300b includes a front panel 202b, a rear panel 204b, opposed glue flaps 206b, 207b and a closure flap 208b. The first blank 300a and the second blank 300b are positioned adjacent to each other on the sheet 302. Specifically, an outer edge of glue flap 207a of the first blank 300a is touching an outer edge of glue flap 206b of the second blank 300b. A cut line is formed between the glue flap 207a of the first blank 300a and the glue flap 206b of the second blank 300b such that cutting along the cut line separates the first and second blanks 300a, 300b.

[0027] Hatched areas on the sheet 302 show offcuts formed when the blanks 300a-d are cut from the sheet 302. It can be seen that there is significant wastage between the blanks 300a-d and also around the edges of the blanks 300a-d.

[0028] In the arrangement shown in Figure 3, the blanks 300a-d are oriented in the same direction. That is, each blank 300a-d has the closure flap 208a, 208b on the right. In another known arrangement (called an interlocking arrangement), one of the first and second blanks 300a, 300b may be rotated by 180 degrees, such that the closure flap 208a, 208b is on the left. This allows the glue flaps 206a, 206b to be 'interlocked'.

[0029] The term 'interlock' when used herein encompasses situations in which one or more parts of adjacent blanks have complimentary profiles such that they fit together. It is not necessary that the profiles lock together only that there is some amount of tessellation. In the example given above, if the first blank 300a is rotated by 180 degrees, the glue flap 206a and an outer edge of the rear panel 204a form a complimentary tooth-like arrangement with an outer edge of the rear panel 204b and the glue flap 206b of the second blank 300b.

[0030] Interlocking adjacent blanks 300a, 300b greatly reduces offcut wastage between the blanks. However,

as the closure flaps 208a, 208b are located at opposite ends, offcut wastage is increased at the ends of the blanks 300a, 300b.

[0031] Figure 4 shows a blank 400 for a packaging envelope. The blank 400 includes a front panel 402, a rear panel 404 and two glue flaps 406, 407. The front panel 402 is foldably connected to the rear panel 404. In the example shown in figure 4, the front panel 402 is connected to the rear panel 404 along a panel fold line 410. The first glue flap 406 is foldably connected to the front panel 402 and the second glue flap 407 is foldably connected to the rear panel 404. In the example of Figure 4, the first and second glue flaps 406, 407 are foldably connected to the front and rear panels 402, 404 along first and second glue flap fold lines 412, 414 respectively.

[0032] The first glue flap 406 is foldably connected to an edge of the front panel 402 that is adjacent to the edge of the front panel 402 including the panel fold line 410. The second glue flap 407 is foldably connected to an edge of the rear panel 404 that is adjacent to the edge of the rear panel 404 including the panel fold line 410. The first and second glue flaps 406, 407 are foldably connected to opposed edges of the blank 400.

[0033] In other arrangements, the first and second glue flaps 406, 407 may be foldably connected to adjacent edges of the blank 400. For example, the first glue flap 406 may be foldably connected to the front panel 402 on the edge to which the closure flap 408 is shown as connected in Figure 4. In such arrangements, the closure flap 408 is moved to be foldably connected to the remaining edge of the blank 400 where the envelope opening will be formed - in this case replacing the first glue flap 406 in Figure 4.

[0034] Corners 416, 418 of the first and second glue flaps 406, 407 that are proximal to the panel fold line 410 (where the front panel 402 is foldably connected to the rear panel 404) are chamfered. This makes folding of the front and rear panels 402, 404 and the first and second glue flaps 406, 407 easier and increases the effective operation of the packaging envelope formed from the blank 400.

[0035] The front panel 402 comprises a plurality of further fold lines 420 inset from an outer edge of the front panel 402 to allow expansion of the packaging envelope to accommodate bulky items. Similar further fold lines 422 may be included on the rear panel 404. Oblique fold lines 426 may also be formed at the corners of the front and rear panels 402, 404 to assist with expansion and provide increased structural integrity to protect an item to be delivered.

[0036] In the example of Figure 4, the front and rear panels 402, 404 (and therefore the packaging envelope) have an oblong shape and the panel fold line 410 is located on the shorter edge of the front and rear panels 402, 404. In other arrangements, the panel fold line 410 may be located at the longer edges of the front and rear panels 402, 404. In such arrangements, the glue flaps 406, 407 and the closure flap 408 may be moved accordingly, e.g. such that they are positioned on shorter edges of the front and rear panels.

[0037] Figure 5 shows a plurality of blanks 500a-e formed on a sheet 502 of packaging envelope substrate. The sheet of packaging substrate may encompass a roll of packaging substrate. That is, the sheet may be packaged into a roll, e.g. for ease of storage and transportation. Accordingly, blanks disclosed herein may be formed on a single sheet of packaging substrate, or on a sheet that has been dispensed from (and may still be attached to) a roll of packaging substrate.

[0038] Each blank may be the blank 400 shown in Figure 4 and the same or similar reference numerals are used in Figure 5 to describe features of the blanks 500a-e. The hatched areas show offcut wastage, which can be seen to be significantly reduced when compared to the offcut wastage of Figure 3.

[0039] Taking two adjacent blanks 500a, 500b, it can be seen that a first blank 500a has a rear glue flap 407a foldably connected to the rear panel 404a. The second blank 500b has a front glue flap 406b foldably connected to the front panel 402b. The first and second blanks 500a, 500b are positioned on the sheet 502 such that the rear glue flap 407a and the front glue flap 406b interlock. Because the front and rear glue flaps 406b, 407a are each positioned on front panel 402b and rear panel 404a respectively, the closure flaps 408a, 408b of the first and second blanks 500a, 500b are both at the same end. This allows reduction in the amount of offcut wastage at the ends of the blanks 500a, 500b. This pattern of adjacent blank arrangement may be used for all blanks 500a-e.

[0040] In the arrangement shown in Figure 5, the first blank 500a also includes a front glue flap 406a foldably connected to the front panel 402a. The front glue flap 406a of the first blank 500a is positioned at an opposite edge of the first blank 500a to the rear glue flap 407a. The second blank 500b includes a rear glue flap 407b foldably connected to the rear panel 404b. The rear glue flap 407b of the second blank 500b is positioned at an opposite edge of the second blank 500b to the front glue flap 406b.

[0041] One or more cut lines 504, 506 separate the first blank 500a from the second blank 500b. A first cut line 504 separates the front glue flap 406b of the second blank 500b from the front panel 402a of the first blank. A second cut line 506 separates the rear glue flap 407a of the first blank from the rear panel 404b of the second blank 500b.

[0042] It is noted that the arrangement shown in Figure 4 (and Figure 5) requires for the front and rear glue flaps 406, 407 of each blank 400 to be folded in opposite directions during assembly of the packaging envelope from the blank 400. That is, one glue flap must be folded upwards and the other glue flap must be folded downwards. This is contrary to normal operation of an automated production line used to form packaging envelopes from blanks, which are typically configured to fold both glue flaps upwards from the front panel onto the rear panel,

as would be the case in the blank 200 of Figure 2.

[0043] Figure 6 shows a packaging envelope 600 formed from the blanks 400, 500a-e of Figures 4 and 5.

[0044] In other arrangements, the first blank may comprise first and second rear glue flaps foldably connected to opposed edges of the rear panel. The second blank may comprise first and second front glue flaps foldably connected to opposed edges of the front panel. This arrangement may be reversed such that the first blank comprises first and second front glue flaps and the second blank comprises first and second rear glue flaps. In this way, offcut wastage is removed to the same or a similar degree as shown in Figure 5, but the glue flaps are both folded in the same direction during assembly of the packaging envelope.

[0045] Figure 7 shows a flow diagram of a method of forming the plurality of blanks 500a-e on the sheet 502.

[0046] At step 700, a plurality of fold lines are formed on the sheet 502, which may be done in a way known to the skilled person. At step 702, a plurality of cut lines are formed in the sheet 502, which may be done in a way known to the skilled person. The plurality of fold lines are arranged to allow elements of the blank to be folded to form the packaging envelope 600 and/or during use of the packaging envelope 600. The cut lines define where the sheet 502 should be cut in order to separate the blanks 500a-e. The blanks 500a-e formed on the sheet 502 may have the features discussed above and/or that are shown in Figures 4, 5 and 6. Further, the blanks 500a-e formed on the sheet 502 may be positioned adjacent each other such that glue flaps interlock, as described above.

[0047] Forming the fold lines 700 may include forming the panel fold line 410 and glue flap fold lines 412, 414. That is, forming the fold lines 700 may include forming the fold line 412 that foldably connects the front glue flap 406 to the front panel 402 and/or forming the fold line 414 that foldably connects the rear glue flap 407 to the rear panel 404. In arrangements in which the first and second glue flaps 406, 407 are both foldably connected to the front panel 402 or the rear panel 404, forming the fold lines 700 may include forming those fold lines.

[0048] Forming the cut lines 702 may include forming the cut lines 504, 506 of Figure 5. More broadly, forming the cut lines 702 may include forming cut lines that separate interlocking glue flaps 407a, 406b of adjacent blanks 500a, 500b from front panels 402a, 402b or rear panels 404a, 404b. In arrangements in which the first and second glue flaps 406, 407 are both foldably connected to the front panel 402 or the rear panel 404, forming the cut lines 702 may include forming cut lines separating those glue flaps from the front panel 402a, 402b or rear panel 404a, 404b of an adjacent blank.

[0049] Fold lines may be formed by pressing a suitable tool into the packaging envelope substrate. It is noted that cut lines may not be physically formed on the sheet 502 and may instead exist in a design for the blanks 500a-e, which may be embodied in software. Accordingly, forming the cut lines may encompass generating instructions for a machine to cut the sheet 502 at particular locations.

[0050] It is also noted that steps 700 and 702 of Figure 7 may be undertaken in any suitable order.

[0051] Figure 8 shows a flow diagram of a method of forming a packaging envelope 600 from a blank 400. The rear panel 404 is folded about the panel fold line 410 onto the front panel 402. Adhesive is applied 802 to the front glue flap 406. The front glue flap 406 is folded onto an outer surface of the rear panel 404. Pressure may be applied to allow the adhesive to bond the front glue flap 406 to the rear panel 404 such that it is held in position. Adhesive is applied 806 to the rear glue flap 407. The rear glue flap 407 is folded onto an outer surface of the front panel 402. Pressure may be applied to allow the adhesive to bond the rear glue flap 407 to the front panel 402 such that it is held in position.

[0052] The method of Figure 8 may be undertaken automatically by a machine designed for that purpose.

[0053] It is noted that steps 800-808 of Figure 8 may be undertaken in any suitable order.

[0054] It will be apparent to those skilled in the art that various modifications and variations can be made to the disclosed systems and methods. Other embodiments will be apparent to those skilled in the art from consideration of the specification and practice of the disclosed systems and methods. It is intended that the specification and examples be considered as exemplary only, with a true scope being indicated by the following claims and their equivalents.

Claims

1. A sheet of packaging envelope substrate having formed thereon a plurality of blanks for packaging envelopes, each blank comprising:

   a front panel;
   a rear panel foldably connected to the front panel; and
   a pair of glue flaps, each foldably connected to one of the front panel or the rear panel, wherein,
   when the rear panel is folded onto the front panel, each glue flap is foldable onto the front panel or the rear panel to which it is not foldably connected to retain that front panel or rear panel in place,
   wherein a first blank of the plurality of blanks comprises a rear glue flap foldably connected to the rear panel thereof, and a second blank of the plurality of blanks comprises a front glue flap foldably connected to the front panel thereof,
   and wherein the first and second blanks are positioned adjacent to each other on the sheet such that the front and rear glue flaps interlock.

2. The sheet according to claim 1, wherein the first blank further comprises a front glue flap foldably connected to the front panel thereof.

3. The sheet according to claim 1 or 2, wherein the second blank further comprises a rear glue flap foldably connected to the rear panel thereof.

4. The sheet according to claim 1, wherein the first blank comprises a further rear glue flap foldably connected to the rear panel thereof.

5. The sheet according to claim 1 or 4, wherein the second blank comprises a further front glue flap foldably connected to the front panel thereof.

6. The sheet according to any preceding claim, wherein the first blank and the second blank comprise a closure flap foldably connected to the front panels thereof.

7. The sheet according to any preceding claim, wherein one or more cut lines separate a glue flap of the first blank from a front or rear panel of the second blank, and/or wherein one or more cut lines separate a glue flap of the second blank from a front or rear panel of the first blank.

8. The sheet according to any preceding claim, wherein a corner of each glue flap that is proximal to the foldable connection of the front panel to the rear panel is chamfered.

9. The sheet according to any preceding claim, wherein the packaging envelope formed from each blank has an oblong shape, and wherein the front panel is foldably connected to the rear panel at a short edge of the packaging envelope.

10. The sheet according to any preceding claim, wherein the packaging envelope substrate is a paper based substrate.

11. A packaging envelope formed from a blank taken from a sheet of packaging envelope substrate according to any of claims 1-10.

12. A method of forming a plurality of blanks on a sheet of packaging envelope substrate, comprising:

forming a plurality of fold lines and/or cut lines on the sheet for defining the plurality of blanks, wherein each blank comprises:

a front panel;
a rear panel foldably connected to the front panel; and
a pair of glue flaps, each foldably connected to one of the front panel or the rear panel,
wherein, when the rear panel is folded onto the front panel, each glue flap is foldable onto the front panel or the rear panel to which it is not foldably connected to retain that front panel or rear panel in place,
wherein a first blank of the plurality of blanks comprises a rear glue flap foldably connected to the rear panel thereof, and a second blank of the plurality of blanks comprises a front glue flap foldably connected to the front panel thereof,
and wherein the first and second blanks are positioned adjacent to each other on the sheet such that the front and rear glue flaps interlock.

13. A blank for a packaging envelope, comprising:

a front panel;
a rear panel foldably connected to the front panel;
a first glue flap foldably connected to the front panel such that, when the rear panel is folded onto the front panel, the first glue flap may be folded onto the rear panel; and
a second glue flap foldably connected to the rear panel such that, when the rear panel is folded onto the front panel, the second glue flap may be folded onto the front panel.

14. A method of forming a packaging envelope from a blank, the blank comprising a front panel, a rear panel foldably connected to the front panel, a first glue flap foldably connected to the front panel, and a second glue flap foldably connected to the rear panel, the method comprising:

folding the rear panel onto the front panel;
applying an adhesive to the first glue flap;
folding the first glue flap onto the rear panel;
applying an adhesive to the second glue flap; and
folding the second glue flap onto the front panel.

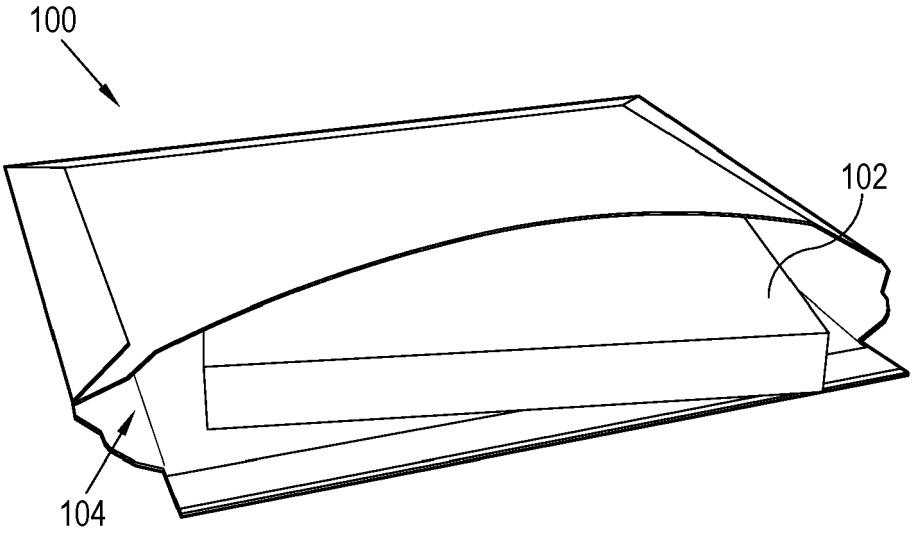


Fig. 1

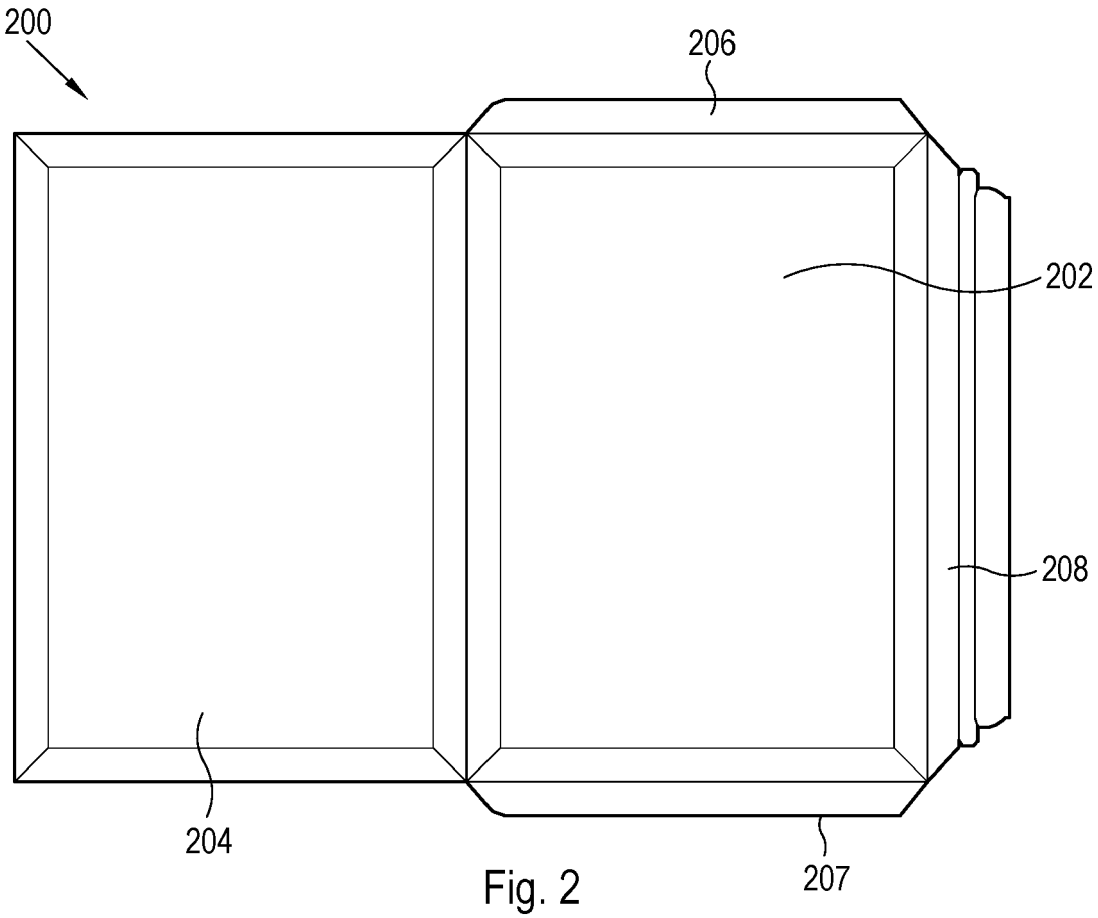
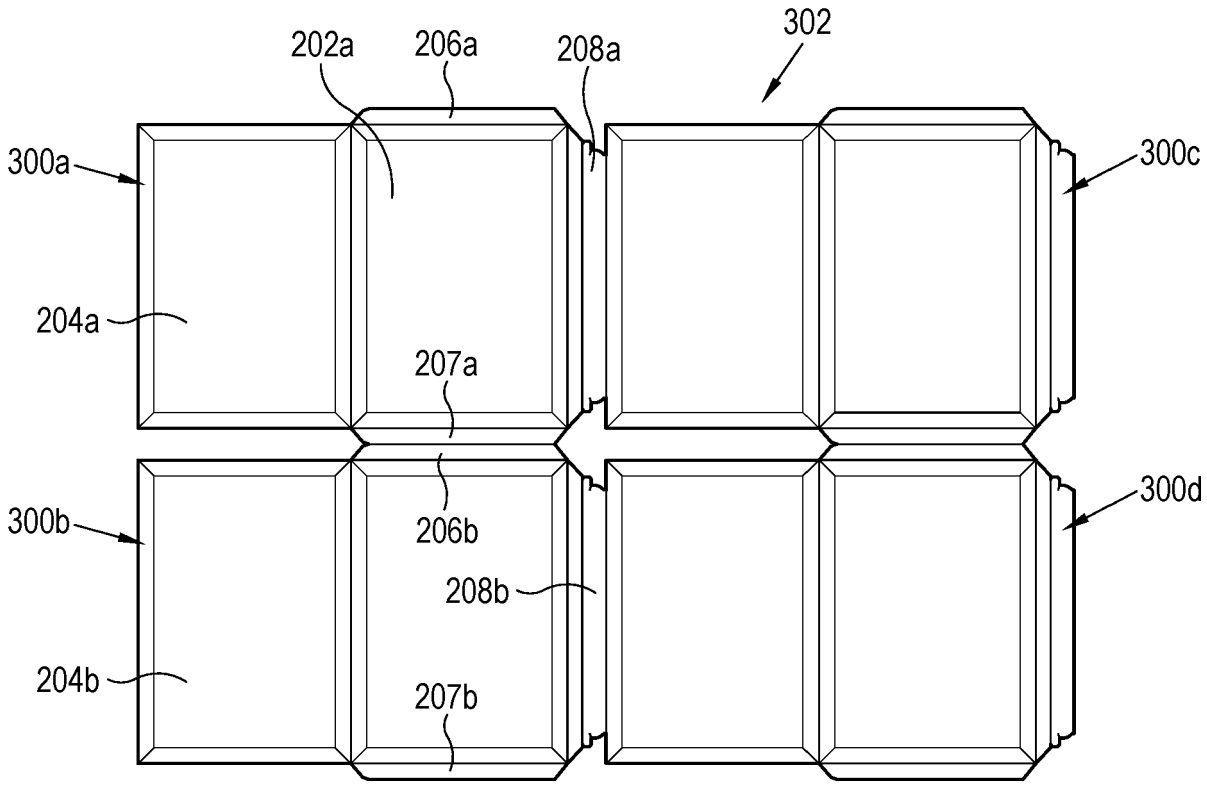


Fig. 2


202a
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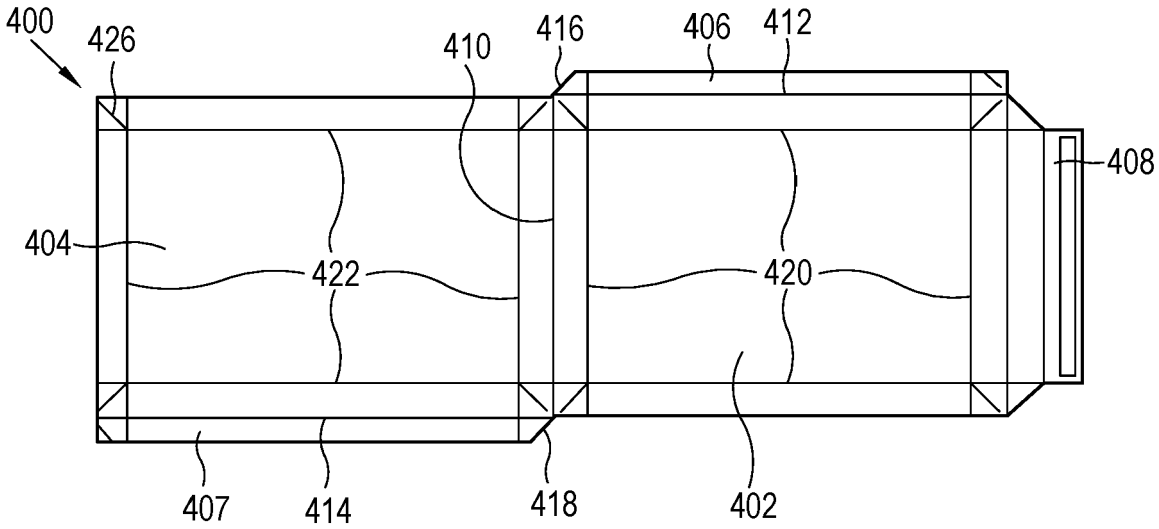
208a
302
300a
300c
204a
207a
206b
300b
300d
208b
204b
207b

Fig. 3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426
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416
406
412
408
404
422
420
407
414
418
402

Fig. 4

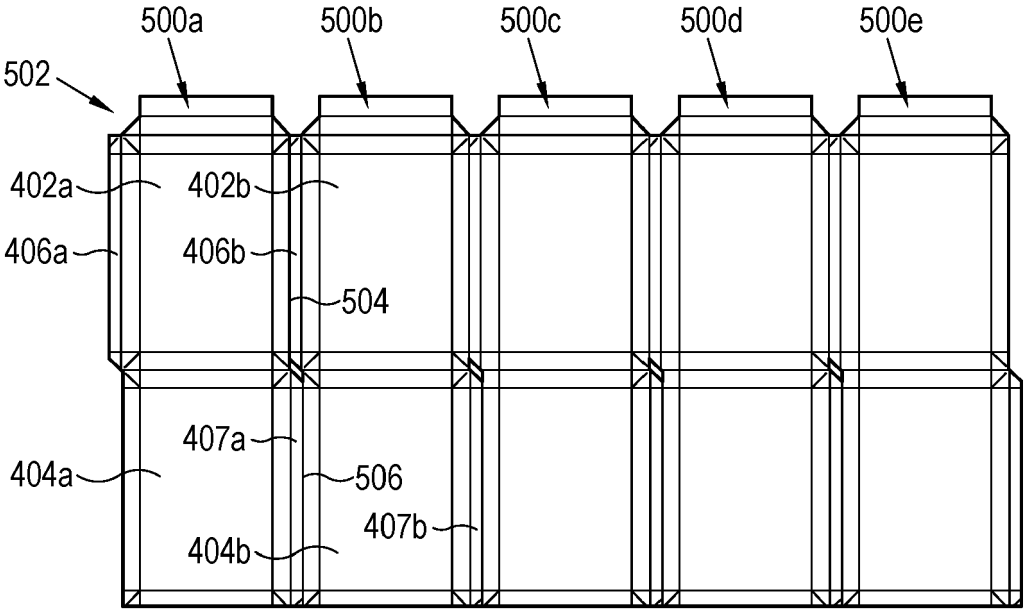
500a
500b
500c
500d
500e
502
402a
402b
406a
406b
504
407a
404a
506
407b
404b

Fig. 5

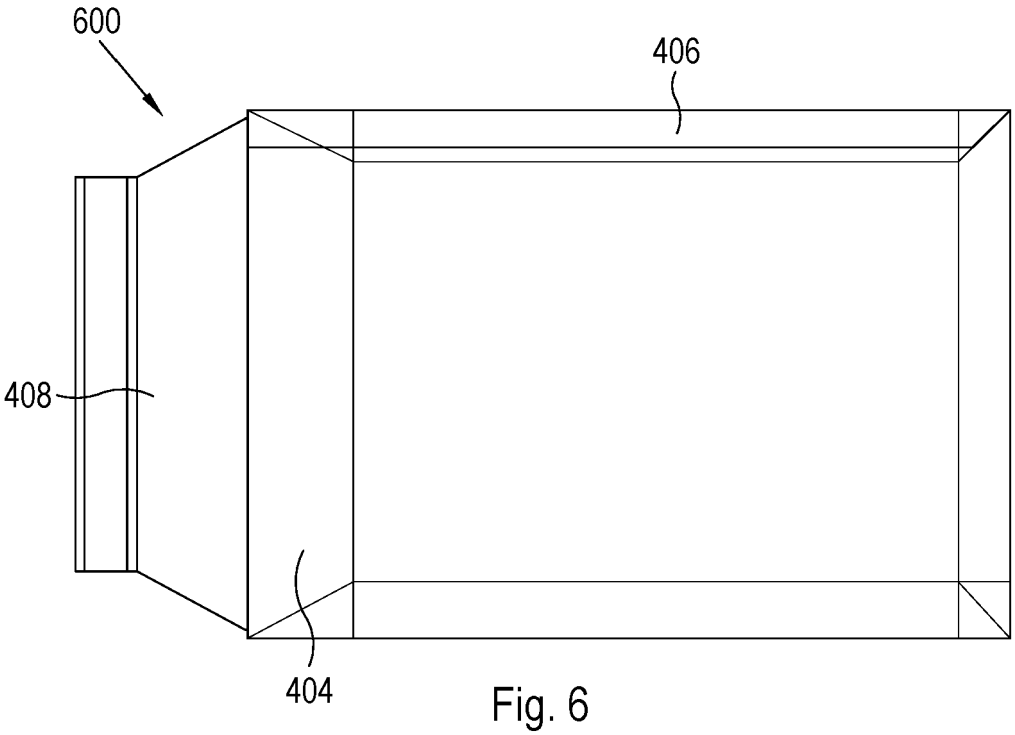
600
406
408
404

Fig. 6

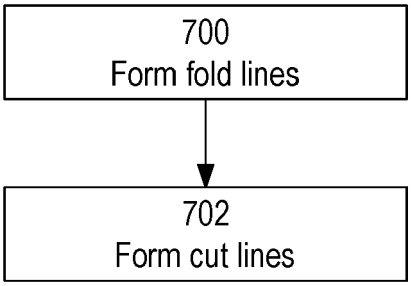
700
Form fold lines
702
Form cut lines

Fig. 7

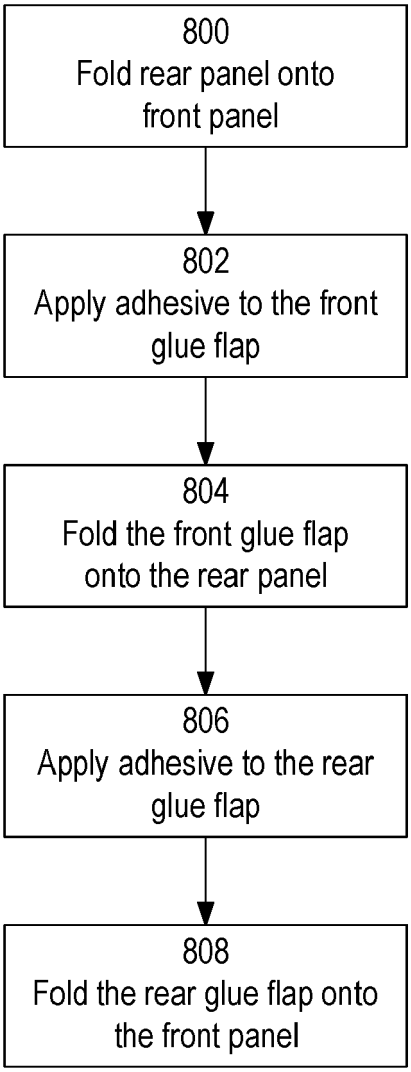
800
Fold rear panel onto front panel
802
Apply adhesive to the front glue flap
804
Fold the front glue flap onto the rear panel
806
Apply adhesive to the rear glue flap
808
Fold the rear glue flap onto the front panel

Fig. 8

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 23 17 3786

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 093 239 A5 (SIEMCO SA) 28 January 1972 (1972-01-28) * figure 1 *	1-14	INV. B65D27/00
Y	DE 183 300 C (WALDEMAR ET AL) 9 April 1907 (1907-04-09) * figures 1-4 *	1-14	
Y	US 6 227 444 B1 (MAKOFSKY MARVIN A [US] ET AL) 8 May 2001 (2001-05-08) * the whole document *	1-14	
			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	31 October 2023	Wimmer, Martin

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

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