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(54) Title: HANDLE STRUCTURE FOR CARTONS AND METHOD FOR FORMING SAME

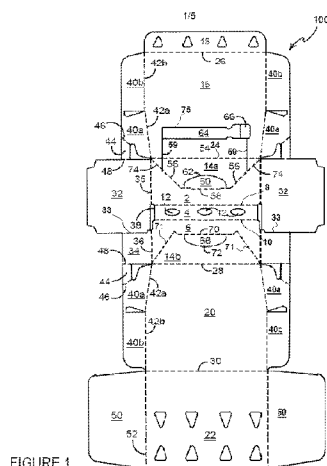


FIGURE 1

(57) Abstract: A handle structure (102) for a carton (104) for packaging one or more articles (A). The handle structure (102) comprises a first handle panel (2) and second handle panel (6) that are secured to one another through one or more apertures (12) defined in an intermediate handle panel (4) positioned between the first (2) and second (6) handle panels.

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Handle Structure for Cartons and Method for Forming Same

Field of the Invention

5 The present disclosure relates generally to the field of handle structures for cartons used in packaging articles. More specifically, although not exclusively, the disclosure relates to handle structures that comprise three or more layers, at least one intermediate layer having an aperture defined therein such that two or more of the layers may be secured to one another through that aperture.

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Background to the Invention

It is known in the art to provide handle structures for cartons, so as to facilitate the lifting and subsequent handling of those cartons, especially once the cartons are loaded with articles and are, therefore, relatively heavy.

15

To accommodate the increased stresses that the weight of the loaded carton poses to the handle structure, it is known in the art to use reinforcing layers of material to augment the maximum lifting capability of the handle structure, and in so doing also increasing the robustness of the handle structure against accidental tearing.

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However, due to the high production volumes and low unit price of cartons comprising these handle structures, there exists a disadvantage with known handle structures in that the application of the aforementioned reinforcing layers requires relatively complex folding operations and higher volumes of strong adhesive compounds. This adds to the production cost and slows down the production rate, both factors negatively impacting upon the profitability of carton manufacture.

25

The present disclosure described below sets out to overcome or to at least mitigate the disadvantages present in the prior art.

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Summary of the Invention

A first aspect of the disclosure provides a handle structure for a carton for packaging one or more articles, which handle structure comprises a first panel and second panel that are secured to one another through one or more apertures defined in an intermediate panel positioned between the first and second panels.

Preferably, the first and second panels are secured to one another by one or more of adhesive; mechanical fasteners; and thermal bonding, through said one or more apertures.

Preferably, one or more of the first and second panels are also secured to the intermediate panel.

Preferably, there further comprises one or more additional intermediate panels, each comprising one or more apertures through which the first panel and the second panel are secured to one another.

Preferably, the first and second panels are hinged to opposing edges of the intermediate panel.

Preferably, the handle structure forms a part of a carton for packaging articles.

Preferably, there further comprises one or more articles that are loaded into the carton to form a package.

A second aspect of the disclosure provides a blank for forming a handle structure, which panel comprises a first panel, a second panel and an intermediate panel that comprises one or more apertures, wherein the first and second panels are foldable relative to the intermediate panel such that the intermediate panel is positioned therebetween, and wherein the one or more apertures formed in the intermediate

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panel are sized and arranged to allow securement of the first and second panels to one another therethrough, thereby to form a handle structure.

Preferably, there further comprises one or more additional intermediate panels that
5 are securable between the first and second panels.

Preferably, there further comprises panels for forming walls of a carton, of which carton the handle structure forms a part when the blank has been set up.

10 A third aspect of the disclosure provides a method for forming a blank into a handle structure for a carton for packaging one or more articles, which method comprises providing a blank that comprises a first panel, a second panel and an intermediate panel defined within which are one or more apertures, and which method further
15 comprises securing the first panel to the second panel through one or more of the apertures of the intermediate panel, such the intermediate panel is secured between the first and second panels.

Preferably, the securing of the first panel to the second panel involves the use of one or more of adhesive; mechanical fasteners; and thermal bonding.

20

Preferably, the method further comprises securing one or more of the first and second panels to the intermediate panels.

25 Preferably, the blank further comprises panels for forming walls of a carton for packaging one or more articles, and wherein the blank is erected into a carton after the handle structure has been formed, and the resulting partially set up blank positioned over said one or more articles.

30 Alternatively, the blank further comprises panels for forming walls of a carton for packaging one or more articles, and wherein the handle structure is formed after the carton has been formed from those panels of the blank.

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Brief Description of the Drawings

The present disclosure is described below with reference to the attached figures, in which:

- 5 Figure 1 illustrates a blank for forming a carton which blank comprises panels for forming a handles structure according to a preferred embodiment of the disclosure;

Figure 2 illustrates a step in a preferred sequence of folding operations for forming a handle structure according to a preferred embodiment of the disclosure from the
10 blanks shown in Figure 1;

Figure 3 illustrates the blank of Figure 1 after the handle structure comprises therein has been fully set up;

- 15 Figure 4 illustrates the blank of Figure 1 being partially erected around a group of articles; and

Figure 5 illustrates a fully erected carton formed from the blank of Figure 1, loaded with articles and being suspended by the handle structure comprises therein.
20

Detailed Description of the Preferred Embodiments

Figure 1 illustrates a blank 100 comprising panels for forming a handle structure 102 according to the present disclosure. The Figure shows a first handle panel 2 hinged
25 to an intermediate handle panel 4 via a fold line 8. The intermediate handle panel 4 is in turn hinged to a second handle panel 6 via a fold line 10. Defined within the intermediate handle panel 4 are a number of apertures 12, arranged along a longitudinal axis thereof.

- 30 The blank 100 optionally further comprises panels for forming a carton. To this end, there is provided a linear series of panels for forming the walls of the carton. The

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linear series comprises first and second parts 14a, 14b of a top panel. The first part 14a is hingedly connected to the first handle panel 2 along fold lines 74, 58, 74 while the second part 14b is hingedly connected to the second handle panel 6 along fold lines 71, 72, 71. The first part 14a is further hingedly connected to a first side panel 16 along a fold line 24 while the second part 14b is further hingedly connected to a second side panel 20 along a fold line 28. The first side panel 16 is then hingedly connected to a bottom fastening flap 18 via a fold line 26, and the second side panel 20 is hingedly connected to a bottom panel 22 via a fold line 30.

Along transverse edges of the linear series of panels are formed multiple end flaps for forming composite end closures to the carton, such that it may retain articles within the carton. To this end, the transverse edges of each of the first and second side panels comprise fold lines 42a, 42b along which upper and lower end flaps 40a and 40b are hingedly connected to the respective side panel. A gusset panel 44 is hingedly connected to each upper end flap 40a along a foldable connection 46.

A pair of first top end flaps 32 are hingedly connected to the opposed transverse edges 35 of the first handle panel 2 whereas a pair of second top end flaps 34 are hingedly connected to the opposed transverse edges 36 of the second handle panel 6. Each first top end flap 32 has no direct connection with the adjacent second top end flap 34 except in some embodiment wherein a small number of nicks are provided to temporarily connect between the flaps 32, 34. In the embodiment illustrated in Figure 1, each first top end flap 32 is separated from the adjacent second top end flap 34 by a frangible line 33 such as a cut or slit. However, they may be separated by a notch or cutout in an alternative embodiment.

Each gusset panels 44 links the adjacent one of the upper end flaps 40a to the adjacent one of the top end flaps 32, 34 along a fold line 48.

Disposed along the opposed transverse edges of the bottom panel 22 are bottom end flaps 50, hinged to the bottom panel 22 by fold lines 52.

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To facilitate the deployment of the handle structure in a set up condition, first 60 and second 68 finger flaps are defined in the first 14a and second 14b parts of the top panel respectively. The first finger flap 60 is hinged to the first handle panel 2 along a fold line 58 and extends into the first part 14a. A curved free edge of the first finger flap 60 is defined by a cut line 62, which terminates at either end of the fold line 58. Preferably, the cut line 62 comprises nick portions to maintain a connection between the first finger flap and the adjacent portions of the first part of the top panel 14a, until such time as the finger flap is used. The first finger flap 60, when folded about the fold line 58, defines a hand opening in the first part 14a for receiving one or more fingers of a carton user.

The second finger flap 68 is substantially identical to the first finger flap 60, and is hinged to the second handle panel 6 via a fold line 70. The second finger flap 68 then extends into the second part 14b of the top panel. The free edge of the second finger flap 68 is defined by a cut line 72. As with the first finger flap 60, nick portions of uncut material may be provided to span the cut line 72 to provide a connection between the second finger flap 68 and the second part 14b of the top panel until the finger flap is used. The second finger flap 68, when folded about the fold line 70, defines a hand opening in the second part 14b for receiving one or more fingers of a carton user.

The fold lines 74 of the first part 14a emanate from the intersections of the fold lines 24 and 35 and extend substantially towards a central portion of the handle structure 102. These fold lines 74 terminate at points where the fold lines 74 reach the first handle panel 2. In like manner, the fold lines 71 of the second part 14b emanate from the intersections of the fold lines 28 and 36 and extend substantially towards a central portion of the handle structure 102. These fold lines 71 terminate at points where the fold lines 71 reach the second handle panel 6.

Defined partially in the first part 14a of the top panel and partially in the first side panel 16 is an opening feature 54. The opening feature 54 is defined by the cut line 62, by respective frangible sections 56 of the fold lines 74 and by a pair of frangible

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lines 59 that extend from the frangible sections 56 to a tear access feature 64 defined in the first side panel. Each frangible line 59 then extends from a point on the respective fold line 74 where the respective frangible section 56 starts and terminates on a tear line 75 that defines the tear access feature 64. Each frangible
5 line 59 is disposed perpendicular to the fold line 24 hinging the first part 14a to the first side wall 16. The tear access feature 64 comprises a tear initiation tab 66.

The blank 100 shown in Figure 1 is symmetrical about its longitudinal axis running perpendicular through the linear series of panels and therefore the identical end
10 panels formed along the opposing transverse edge of the linear series of panels have not been fully described.

To form the handle structure 102 from the blank 100, one or both of the first and second handle panels 2, 6 are preferably applied with one or more strips of glue
15 (denoted by 'G1' in Figure 2) and are folded into face-contacting relationship with the intermediate panel 4. This folding process may be carried out for one handle panel 2 or 6 at a time or for both the handle panels 2, 6 at the same time. Apparently, one of the handle panels 2, 6 is brought into contact with one of the opposed sides of the intermediate handle panel 4 while the other of the handle panels 2, 6 is brought into
20 contact with the other side of the intermediate handle panel 4. In the embodiment illustrated in Figure 2, the glue strip G1 is applied to the upper side of the second handle panel 6, and then the second handle panel 6 is folded about the fold line 10 into flat face contact with the lower side of the intermediate handle panel 4. After that, the first handle panel 2 is folded about the fold line 8 into flat face contact with
25 the upper side of the intermediate handle panel 4. This allows the glue disposed on the second handle panels 6 to pass through the apertures 12 in the intermediate panel 4, and to come into contact with corresponding portions of the first handle panel 2. By this means, all three handle panels 2, 4, 6 are secured together. It is contemplated that other means of securement may also be used, such as
30 mechanical fasteners, and also that glue may optionally be applied to both the first and second handle panels 2, 6. Additionally, it may be that a strip of glue be applied directly to one or both sides of the intermediate panel 4, and then the first and

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second handle panels 2, 6 be folded into contact with the intermediate handle panel. For the glue to span the apertures 12 in the intermediate panel without one of the first 2 and second 6 handle panels being already present therebeneath would be possible as long as the glue were sufficiently viscous. A further option could be to
5 fold one of the first 2 and second 6 handle panels up into contact with the intermediate panel 4, and then to apply glue to the opposing side of the intermediate handle panel 4 before folding the other of the first 2 or second 6 handle panels up into contact therewith.

10 The folding of the first and second and intermediate panels of the handle structure 2, 4, and 6 brings the adjacent edges of the first and second parts 14a, 14b of the top panel into juxtaposition. This results in the first top end panel 32 coming into an overlapping arrangement, or at least a partial vertical alignment, with the second top end panel 34. Preferably, these two end panels 32, 34 are secured to one another
15 via glue (generally denoted as 'G2' in Figure 2) previously disposed upon one or both of the overlapping portions of the surfaces thereof.

Once the handle panels 2, 4, 6 have been fully set up, it provides a reinforced handle structure 102 that may be used to grasp the resulting set up carton shown in Figure
20 5.

Formation of the remainder of the carton (shown partially erected in Figure 4 and fully erected in Figure 5) may take place prior to or during loading of the carton with articles A. In one method of construction, the first side panel 16 and the second side
25 panel 20 are folded perpendicular to the corresponding edges of the top panel 14a/14b, and this now "U-shaped", part-erected carton is disposed over a group of articles A by suitable means such as a packaging machine. The bottom securing tab 18 is folded up under corresponding portions of those articles, and the bottom panel 22 is subsequently folded into securement therewith using some securement means
30 such as glue or mechanical fastening devices. The carton is then completed by the deployment of the end panels 40a, 40b, 34/32, 50 into a plane substantially perpendicular to the top 14a/14b and side 16/20 walls. Once so-folded the end flaps

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are secured to one another to maintain their position, and to close the respective end of the carton 104.

In another method of construction, the blank is preformed into a flat, collapsed tubular form by securing the securing tab 18 to the bottom panel 22. As well known in the packaging art, such a collapsed tubular carton is convenient for transfer and/or storage itself. The collapsed carton is then expanded into a 3dimensional tubular form, typically on a packaging machine, and then loaded with multiple products, such as bottles, through one or both of the opposed open ends. After that, the end closure flaps are folded in a manner similar to that described above and glued together to form opposed end closures for the carton.

Once fully erected, the handle structure 102 is ready for use as a means of lifting and carrying the carton, as shown in Figure 5. The reinforcement afforded by the three layers of panel 2, 4, 6 increases the maximum lift capability of the handles structure 102 compared to similar single layer handle structure. The finger flaps 62, 68 are foldable inwardly of the carton to create handle openings through which the user's fingers can be inserted to grip the handle structure 102.

It can be appreciated that various changes may be made within the scope of the present disclosure, for example, the size and shape of the panels and apertures may be adjusted to accommodate articles of differing size or shape. In other embodiments of the disclosure it is envisaged that the number of apertures 12 in the intermediate handle panel 4 may be altered to allow more or less glue therethrough. Multiple intermediate panels could be provided to provide additional strength by having aligned apertures defined therein, or by separately securing these intermediate panels together. Techniques for thermal bonding such as welding may be used to secure the first and second panels together should they be formed of suitable materials.

It will be recognised that as used herein, directional references such as "top", "bottom", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not

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limit the respective panels to such orientation, but merely serve to distinguish these panels from one another. Any reference to hinged connection should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection can be formed from one or more of the following, a short slit,
5 a frangible line or a fold line without departing from the scope of the invention.

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Claims

1. A handle structure for a carton for packaging one or more articles, the handle structure comprising a first handle panel, a second handle panel and an intermediate handle panel positioned between the first and second handle panels, the first and second handle panels being secured together through one or more apertures in the intermediate handle panel.
5
2. The handle structure according to claim 1, wherein the first and second handle panels are secured to one another by one or more of adhesive; mechanical fasteners; and thermal bonding, through said one or more apertures.
10
3. The handle structure according to claim 1 or claim 2, wherein one or more of the first and second handle panels are also secured to the intermediate handle panel.
15
4. The handle structure according to any one of claims 1 to 3, further comprising one or more additional intermediate panels, each comprising one or more apertures through which the first handle panel and the second handle panel are secured to one another.
20
5. The handle structure according to any one of claims 1 to 3, wherein the first and second handle panels are hingedly connected to opposing side edges of the intermediate handle panel.
25
6. The handle structure according to any one of claims 1 to 5, further comprising a pair of first end flaps and a pair of second end flaps, the first end flaps being hingedly connected to opposing end edges of the first handle panel, the second end flaps being hingedly connected to opposing end edges of the second handle panel.
30

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7. The handle structure according to claim 6, wherein the first end flaps are secured in flat face contacting relationship with the second end flaps respectively.
- 5 8. The handle structure according to claim 6, wherein each of the first end flaps is separated from an adjacent one of the second end flaps such that the each first end flap has no direct connection to the adjacent second end flap.
- 10 9. The handle structure according to claim 8, wherein the each first end flap is separated from the adjacent second end flap by means of a cut.
- 15 10. A blank for forming a carton having a handle structure, the blank comprising a first handle panel, a second handle panel and an intermediate handle panel having one or more apertures, wherein the first and second handle panels are foldable relative to the intermediate handle panel such that the intermediate handle panel is positioned between the first and second handle panels, and wherein the one or more apertures of the intermediate panel are sized and arranged to allow securement of the first and second panels to one another therethrough, whereby a handle structure is formed.
- 20 11. The blank according to claim 10, further comprising one or more additional intermediate panels that are securable between the first and second panels.
- 25 12. The blank according to claim 10 or claim 11, further comprising panels for forming carton walls.
- 30 13. The blank according to claim 10 or 11, further comprising first and second parts of a top panel hingedly connected to the first and second handle panels respectively, a first and second side panels hingedly connected to the first and second parts respectively, and a bottom panel hingedly connected to at least one of the first and second side panels..

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14. A method for forming a blank into a carton having a handle structure, the method comprising the steps of:

providing a blank that comprises a first handle panel, a second handle panel and an intermediate handle panel defined within which are one or more apertures, and

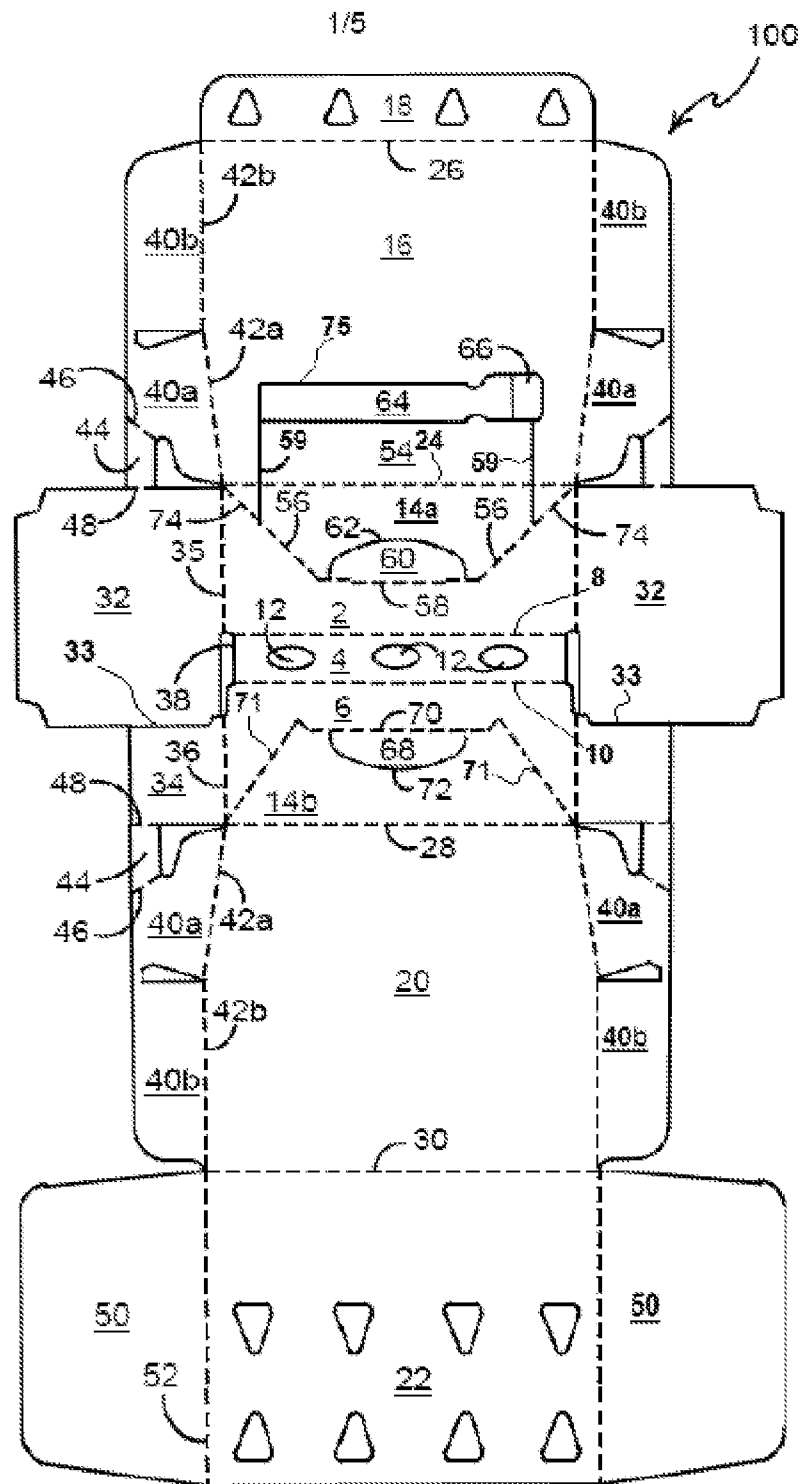
securing the first handle panel to the second handle panel through the one or more apertures, such the intermediate handle panel is secured between the first and second panels.

15. The method according to claim 14, wherein the securing of the first handle panel to the second handle panel involves the use of one or more of adhesive; mechanical fasteners; and thermal bonding.

16. The method according to claim 14, further comprising securing one or more of the first and second handle panels to the intermediate panels.

17. The method according to any one of claims 14 to 16, wherein the blank further comprises panels for forming walls of a carton, and wherein the method further comprises erecting the blank into a carton after the handle structure has been formed, the erecting step comprising positioning the blank having the formed handle structure over one or more articles.

18. The method according to any one of claims 14 to 16, wherein the blank further comprises panels for forming carton walls, and wherein the method further comprises forming the handle structure after the other part of the carton has been formed from the panels for forming the carton walls.



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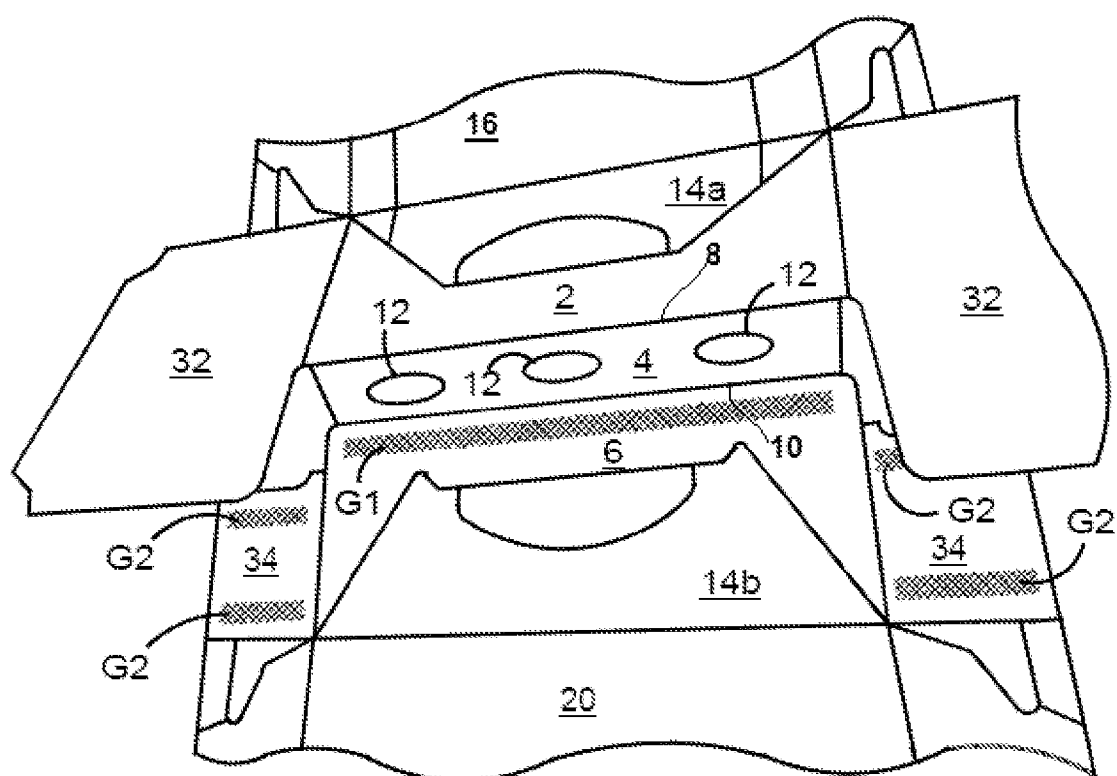


FIGURE 2

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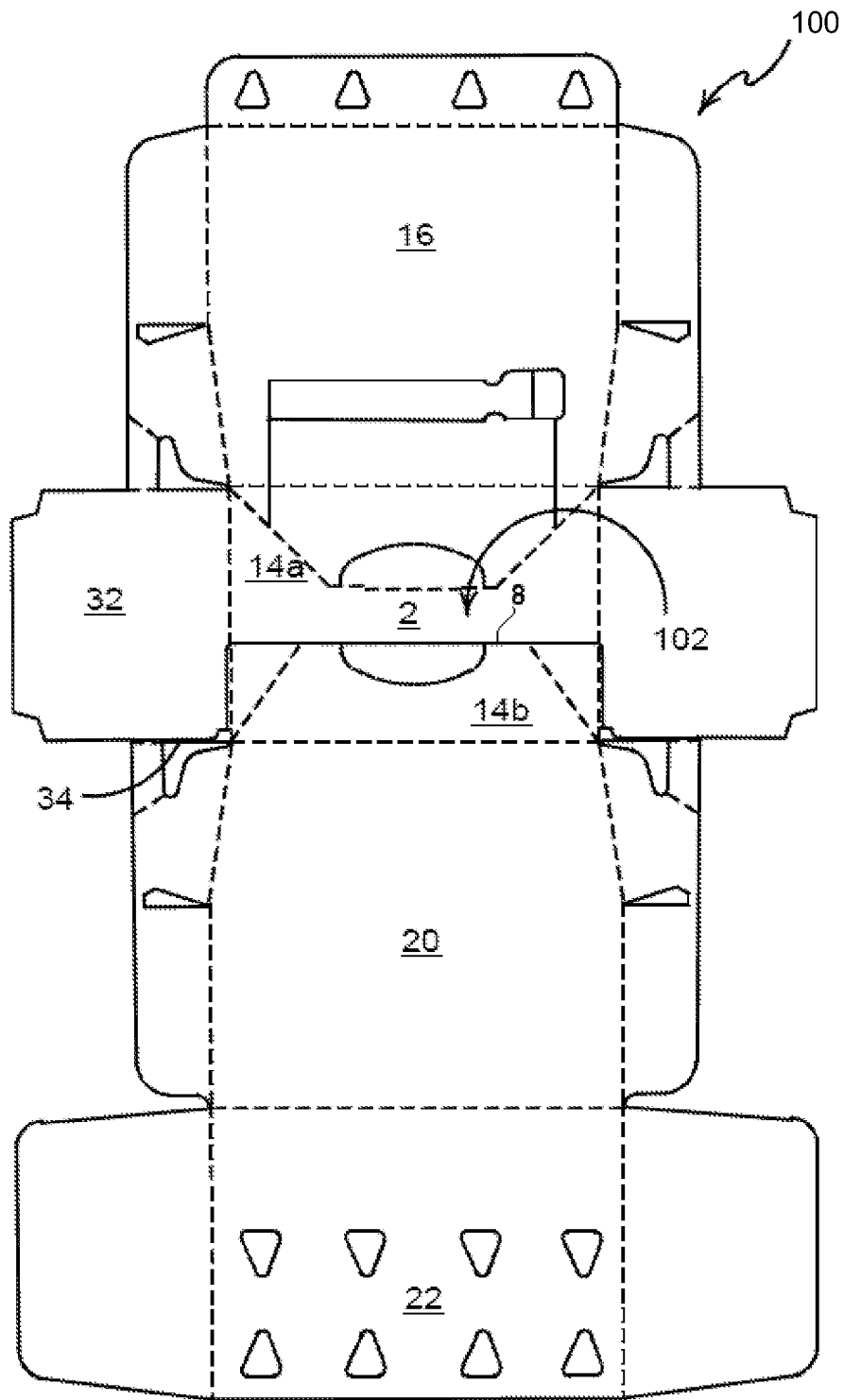


FIGURE 3

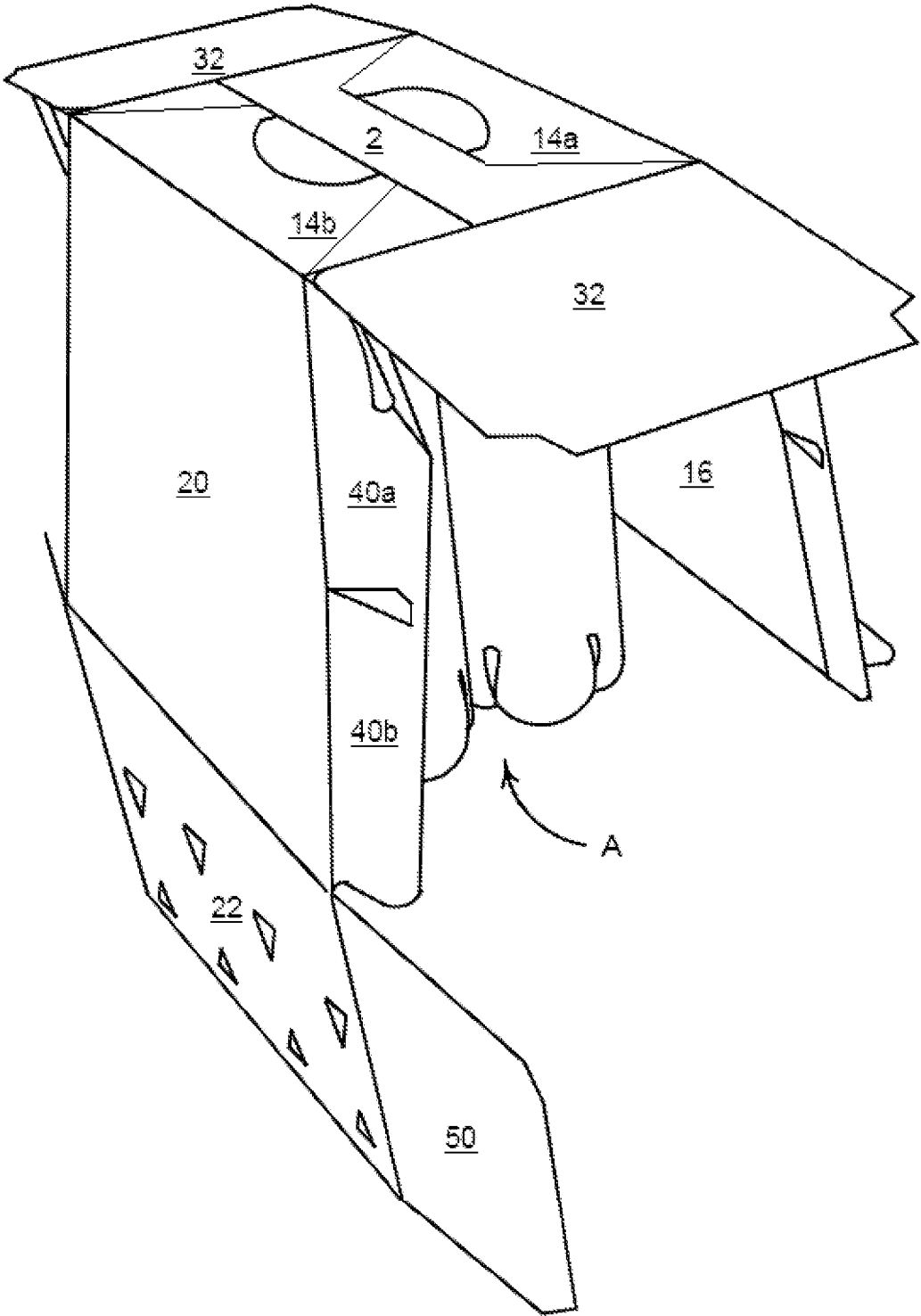


FIGURE 4

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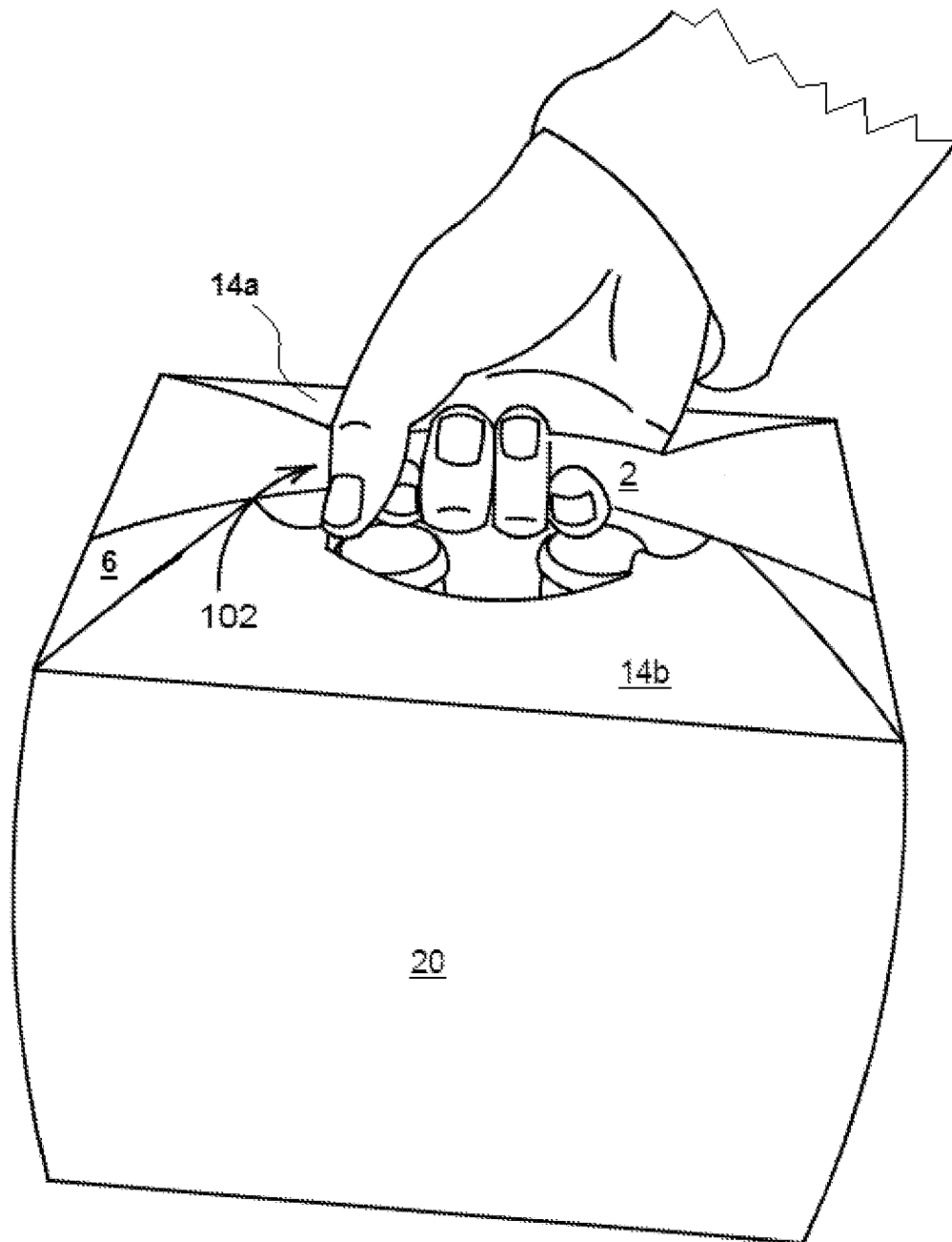


FIGURE 5

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/028204

A. CLASSIFICATION OF SUBJECT MATTER

INV. B65D71/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 160 550 A (LUPTON ELMER H) 30 May 1939 (1939-05-30) page 1, line 53 – page 2, line 25; figures 1,3	1-5,10, 11,14-16
A	WO 03/037742 A2 (MEAD CORP [US]; HOLLEY JOHN M JR [US] MEADWESTVACO PACKAGING SYSTEMS []) 8 May 2003 (2003-05-08) page 7, line 1 – page 9, line 14; figure 1	1-5,10, 11,14-16
A	US 5 927 502 A (HUNTER ANTHONY L [US]) 27 July 1999 (1999-07-27) column 5, line 20 – line 43; figure 2	1-5,10, 11,14-16



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

31 May 2010

Date of mailing of the international search report

05/08/2010

Name and mailing address of the ISA/

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Vesterholm, Mika

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/028204

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-5, 10, 11, 14-16

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-5, 10, 11, 14-16

Structure which enables a carton to be carried

2. claims: 6-9, 12, 13, 17, 18

Structure which prevents the contents of a carton from falling out.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/028204

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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