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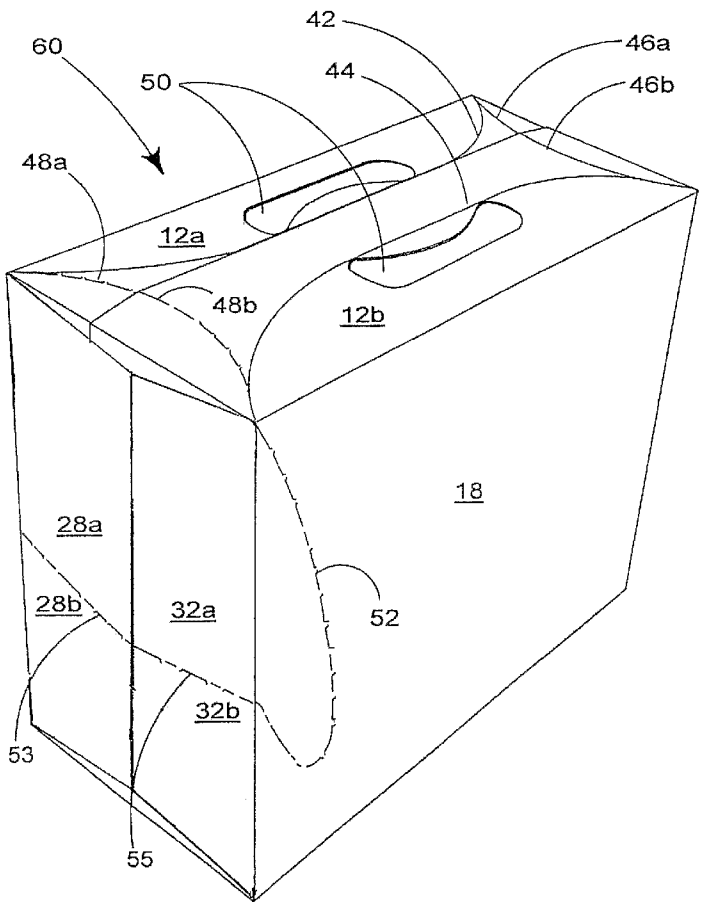
(54) **Title:** CARTON WITH DISPENSER




(57) **Abstract:** A carton for containing a plurality of articles such as cans (C) includes a pair of side walls (14, 18), a bottom wall (16), a top wall (12a/12b) and end closure panels for at least partially closing the ends of the carton. The top wall is of multi-ply construction and the carton further comprises an opening provider defined by a series of weakened lines (48a/48b, 52, 53, 54, 55) in the top, side and end walls. The opening provider includes at least one weakened line coincident at least in part with a stress relieving fold line (48a/48b) to facilitate easy opening of the carton.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

# CARTON WITH DISPENSER

## Technical Field of the Invention

The invention relates to cartons and more particularly to a carton for multiple articles having an access feature for constrained removal of individual articles.

## Background of the Invention

Cartons for encasing multiple articles are useful for enabling consumers to obtain and transport a desired quantity of individual articles such as soft drinks or other beverages. When such a multiple-pack of articles is obtained, a consumer frequently desires to remove one article from the carton at a time and store the remaining articles in the carton. Thus, it can be appreciated that it would be desirable to have a carton with a dispenser that enables the removal of articles from the carton.

When the articles in the carton are cylindrical, and are disposed in the carton upon their sides so that they can roll, it is important that the articles be constrained such that the remaining articles do not roll out of the dispenser when one article is removed. It is also important that the dispenser provides an arrangement in which the articles are easily accessed. It is further often desirable when removing individual articles from a carton to be able to determine how many articles remain in the carton. Thus, it can be further appreciated that it would be desirable to have a carton with a dispenser that constrains remaining articles so that they do not undesirably roll from or otherwise exit the carton when one article is removed. It can also be appreciated that it would be desirable to have a carton with a dispenser that facilitates access to the articles. It can be still further appreciated that it would be desirable to be able to determine how many articles remain in a carton from which individual articles are removed. Since the cartons are used for containing a plurality of articles, it is often desirable for a carrying handle to be provided. Such a handle is required to be sufficiently strong to lift the carton which may contain many cans or bottles.

A carton having a dispenser is disclosed in US 6 484 903. The carton has a detachable trough defined by an endless weakened line formed in the top, end and side walls of the carton. The weakened line in the top wall extends across an overlap of two top panels. The dispenser can therefore be difficult to open since the user has to break through two plies of material to break the weakened line defining the dispenser. Such cartons can therefore be difficult to open and may also not be readily adaptable for containing more than two tiers or articles.

A carton comprising a dispenser and containing three tiers of articles is disclosed in US 3 416 719, the opening disclosed by the carton extends up from a bottom wall and retaining tabs at the front of the carton prevent the articles from being undesirably dislodged. This causes the carton to be inefficient because it requires the consumer to lift the article up over the retaining tabs against downward force of the articles resting on top of it.

It would be desirable to provide an access feature which is sufficiently robust enough to maintain the integrity of the carton whilst being utilized to transport the article within but which can be easily opened to provide access to the contents.

It is therefore an objective of the present invention to provide a carton and blank for forming the carton, that overcomes or at least reduces the problems of the above-mentioned prior art.

## Summary of the Invention

The present invention, in one aspect, provides a package which includes a carton and at least two rows of generally cylindrical articles accommodated in the carton. The carton comprises top and bottom panels interconnected by a pair of opposed side walls to form a generally tubular structure, and an end wall at each end of the tubular structure to at least partially close said each end. One of the rows of the cylindrical articles is arranged to be in rolling contact with the bottom panel. The ends of each article is in abutment with the side walls of the carton respectively. The top panel comprises at least one stress relieving fold line. The carton further comprises an opening provider defined by a substantially continuous frangible connection which comprises a series of weakened lines in the top panel, the side walls and

one of the end walls. The frangible connection is at least in part coincident with the at least one stress relieving fold line.

In a preferred embodiment of the invention, the weakened line in the top panel may be coincident with the at least one stress relieving fold line. The weakened line in the top panel may be arched concavely toward an adjacent one of the end walls. Further, the weakened line in the top panel may extend between a pair of corners of the top panel adjacent to the one end wall.

In another preferred embodiment, the weakened line in each side wall may extend between the top panel and the one end wall. The weakened lines in the side walls may be curved concavely toward the one end wall to partially expose the opposite ends of the end most one of the articles in the one row when the opening provider is detached from the carton.

The invention, in another aspect, provides a carton for cylindrical articles. The carton comprises a generally tubular structure formed from a top panel, a bottom panel, and a pair of side walls connecting together the top and bottom panels. The carton further comprises an end wall at each end of the carton which at least partially closes the respective end of the tubular structure and a handle provided by the top panel. At least one end of the carton has an opening provider to allow removal of the articles. The opening provider is defined by a substantially continuous frangible connection comprising a series of weakened lines in the top panel, the side walls and one of the end walls at said one end. The substantially continuous frangible connection is coincident at least in part with a stress relieving fold line provided for facilitating defining displacement of the top panel when the carton is lifted by the handle.

## Brief Description of the Drawings

An exemplary embodiment of the invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig. 1 is a plan view of a carton blank according to an embodiment of the invention;

Fig. 2 is a perspective view of a carton erected from the blank of FIG. 1;

Fig. 3 is a perspective view of the carton in Fig. 2 with an opening provider removed.

For convenience of understanding, reference may be made to figs. 1, 2, and 3 simultaneously.

Detailed Description of the Preferred Embodiments

Figs. 1 to 3 illustrate a first embodiment of the present invention. Throughout these drawings, the same reference numerals are used to denote the same or like features of the invention.

Figs. 1-3 illustrate a first embodiment of the present invention, in which Fig. 1 shows a blank 10 from which the carton of Figs. 2 and 3 is erected. The blank 10 is vertically elongate as viewed in Fig. 1 and is formed, in this embodiment, of paperboard. However, the blank maybe formed of other foldable material such as a plastic sheet or the like. The blank 10 of this embodiment is designed for packaging articles of an identical configuration, such as beverage cans, arranged in three rows, however alternative configurations are envisaged; Cans "C" are arranged in an 3 x ***n*** configuration, where *n* is an integer number, are shown in Figs. 2 and 3 as an aid in understanding the invention. More specifically, the cans "C" are arranged in a group consisting of three vertically disposed tiers each including *n* cans. The cans "C" in each tier are disposed on their sides in a side-by-side parallel fashion and in rolling contact with a bottom wall panel 68 of the carton 60.

Referring to Fig. 1, the blank 10 includes four primary panels for forming the carton walls, a composite top panel is formed from a first top panel 12a and a second top panel 12b, a first side wall panel 14, a bottom panel 16 and a second side wall panel 18. In the set up carton the top panel 12 is a composite of the first and second top panels 12a and 12b, however alternative configuration are envisaged such as a unitary top panel which may be coupled to a securing panel or glue flap, or in another alternative the bottom or side panel may of a

composite structure. The first and second top wall panels 12a, 12b are each provided with hand apertures 50 which can be employed by a user to lift the carton 60.

The primary panels are hingedly connected one to the next along fold lines 34, 36, 38 and 40. The first top panel 12a is hingedly connected to the first side wall panel 14 along fold line 34. The first side wall panel 14 is hingedly connected to the bottom panel 16 along fold line 36 which is in turn hingedly connected to the second side wall panel 18 along fold line 38. The second side wall panel 18 is hingedly connected to the second top panel 12b. The first and second top panels 12a and 12b are dimensioned such that they can be assembled in an overlapping relationship in the setup carton and secured one to the other.

Reference numerals 20a, 20b, 21a, 21b, 22, 24, 26, 28a/28b 30 and 32a/32b designate end flaps hingedly connected by fold lines 62, 64, 66, 68, 70, 72, 74, 76, 78 and 80 to the ends of primary panels 12a, 12b, 14, 16 and 18. End flaps 20a and 20b and end flaps 21a and 21b are constructed such that they are brought into an overlapping relationship when a carton 60 (Fig. 2) is assembled or erected from the blank. When overlapped and secured in the erected carton, the end flaps 20a and 20b and the end flaps 21a and 21b form composite panels 20a/20b and 21a/21b respectively. The panels 12a and 12b arranged at the upper and lower ends (as viewed in Fig. 1) of the blank 10 are also designed to be brought into an overlapping relationship and secured together to form a composite wall as shown Fig. 2, when the blank 10 is erected into the carton 60.

The first top panel 12a comprises the handle aperture 50 which a user can engage in a setup carton as a means for carrying the carton. The handle aperture comprises a handle flap 51 which extends into the handle aperture 50 and is defined in part by the handle aperture 50 and further defined by the a stress relieving fold line 42. The stress relieving fold line acts as a fold line, defining an edge along which the handle flap may fold when engaged by a user. When in use the handle flap 51 is folded inwardly of the carton such that the handle aperture 50 is substantially elliptical in shape but is not limited to such and alternative shapes could be used. The handle flap 51 allows the use to engage a folded edge the carton material, thus providing the user with a more comfortable handle to use and preventing them from engaging a sharp edge of the carton material.

The stress relieving fold line 42 is arcuate or arched in nature, it and extends from a first corner of the top panel 12a adjacent the side wall panel 14, defined by the vertex between fold lines 62 and 34 to a second corner of the top panel 12a adjacent the side wall panel 14, defined by the vertex between fold lines 80 and 34. The stress relieving fold line provides the top panel with a defined area in which to flex and allows the top panel to be distorted in a controlled way when a load is applied to when the carton is carried by the handle aperture. It is envisaged that the stress relieving score may be of an alternative shape, perhaps forming a rhombus with the fold line 34. In an alternative embodiment, the fold line defining the handle flap may be independent of the stress relieving fold line 42.

Two further stress relieving fold lines 46a, 48a are present in the top panel 12a; these fold lines are substantially perpendicular to stress relieving fold line 42. Fold line 46a extends from the first corner of the top panel 12a defined by the vertex between fold lines 62 and 34 to a point on the free edge opposite fold line 34. Fold line 48a extends from the second corner of the top panel 12a defined by the vertex between fold lines 80 and 34 to a point on the free edge opposite fold line 34. Both fold lines 46a and 48a are arcuate or arched in nature and serve a similar purpose to each other.

The second top panel 12b is substantially the same as the first panel 12a in the sense that it has an arcuate stress relieving fold line 44 equivalent to the line 42 in the first top panel 12a and a flapped handle aperture 50 equivalent to the one in the first top panel 12a. Therefore, the second top panel 12b will not be described in further detail. Except to say that when the first and second top panel are placed in overlapping relationship in a set up carton the stress relieving fold lines 46a, 48a coincide at the point of overlap with stress relieving fold lines 46b, 48b comprised within the second top panel 12b. When coinciding, fold lines 46a, 46b form a single fold line arched concavely toward the fold lines 62, 70 whereas fold lines 48a, 48b, when coinciding, form a single fold line arched concavely toward the fold lines 80, 72. Furthermore, the area between the handle apertures 50 in each of the top panels 12a, 12b forms an area which a user can engage as a carrying handle. Among fold lines 46a, 46b, 48a, 48b, fold lines 48a, 48b each also serves as a weakened line of severance as is discussed hereinbelow for more details.

A series of weakened lines of severance (or tear lines) 48a, 48b, 52, 53, 54, 55 are provided in the first and second top wall panels 12a, 12b, the first and second side wall panels 14, 18 and the side end flaps 28, 32 respectively. The weakened lines of severance 48a, 48b, 52, 53, 54, 55 form a continuous or endless frangible connection between a part of the carton surrounded by the frangible connection and the remainder of the carton to define the opening provider 56 as best shown in Fig. 3. The opening provider in this embodiment is a removable/displaceable portion of the carton formed from the top panels 12a, 12b, the side panels 14, 18 and the end flaps 28a/28b, 32a/32b.

Each weakened line of severance in this embodiment is formed of a series of small cut lines and nicks, which form a frangible connection between the opening provider 56 and the carton 60 to facilitate separation along the length of the weakened line. Other forms of the weakened line of severance includes, but not limited to, a perforation, a line of short slits, a line of half cuts, a combination of slits and score lines, and similar arrangements. The weakened lines of severance 48a, 48b in the top panels 12a, 12b are coincident respectively with the stress relieving fold lines 48a, 48b formed in the top panels 12a, 12b. The coexistence of each weakened line of severance in the top wall and the associated stress relieving fold line provides a tear starter feature which assists a user in initiating breaking the weakened lines of severance when the user engages the opening provider 56.

The carton may further comprise additional weakened lines of severance (not shown) in the first and second top panels 12a, 12b which define finger tabs. The finger tabs would be shaped and structured to yield upon the application of pressure, thereby further assisting a user of the carton with engaging the opening provider 56 thereby enabling the end of the carton 60 to be opened and thus enabling access to be gained to the cans 'C' contained within the carton 60.

Turning to the construction of the carton 60, a series of folding and gluing steps are required, which preferably can be performed in a straight line machine, so that the carton 60 and/or blank 10 are not required to be rotated or inverted to complete the construction. The folding

process is not limited to that described below and can be altered according to particular manufacturing requirements.

To form an erected carton from the blank 10, the blank 12 is folded about fold line 36, so that the inside face of the first side panel 14 contacts both the inside face of the bottom wall panel 16 and in part the second side wall panel 18. Glue is applied to the inside faces of the second top wall panel 12b and top end flaps 20b and 21b which are then folded about the fold line 40 to lie flat on the outside faces of the first top wall panel 12a and top end flaps 20a and 21a respectively. The outside faces of the first top wall panel 12a and top end flaps 20a and 21a may in part be varnish-free so that the second top wall panel 12b and top end flaps 20b and 21b can be secured by means of glue to the first top wall panel 12a and top end flaps 20a and 21a respectively. In this way, a two-ply composite top wall 12a/12b as well as a pair of two-ply composite top end flaps 20a/20b and 21a/21b are formed and a flat tubular carton is provided to a manufacturing plant for further processing.

The flat tubular carton is then expanded into an open-ended tubular form. After cans are loaded through one or both of the open ends of the carton 60, the end flaps 21a/21b, 28a/28b, 30 and 32a/32b at the dispensing end and the end flaps 20a/20b, 22, 24 and 26 at the other end are folded to form the respective end walls to close the ends of the carton 60. To form the dispensing end wall, composite top end flap 21a/21b and the bottom end flap 30 are folded to their respective vertical positions. Glue is applied to the outside faces of the top and bottom end flaps 21a/21b and 30, and then the side end flaps 28a/28b and 32a/32b are folded in the described sequence onto the top and bottom end flaps 21a/21b and 30. This causes the side end flaps 28a/28b and 32a/32b to be glued to the top and bottom end flaps 21a/21b and 30. In the closed position shown in Fig. 2, the side end flaps 28a/28b and 32a/32b overlap each other and are secured together also by means of glue although in an alternative embodiment, they may be simply disposed side by side without overlapping. The other end wall of the carton is formed in like manner by end flaps 20a/20b, 22, 24 and 26.

An erected carton is shown in Fig. 2 wherein the opening provider 56 is integrally formed to be displaceable and/or fully detachable to allow access to the cans 'C' held within the carton 60. The coincidence of the weakened line of severance and the stress relieving fold line

48a/48b in the composite top wall 12a/12b provide a means of easily initiating the tearing of the weakened lines of severance 48a/48b, 52, 53, 54, and 55 which extend from the composite top wall 12a/12b into each of the first and second side wall panels 14, 18 and across the end wall formed by end flaps 28a/28b and 32a/32b. By applying pressure to the weakened line of severance 48a/48b, a part of the opening provider 56 formed from the composite top wall 12a/12b may become separated from the carton 60, thereby creating a void or gap in which a user's fingers may be inserted. The user can then readily engage the opening provider 56 to displace or fully detach the opening provider 56 from the carton 60, as shown in Fig. 3.

The arrangement of the present invention therefore provides an opening provider 56 which requires considerably less pressure and work to employ.

In the preferred embodiment illustrated, the weakened lines of severance 52, 54 are of an arcuate configuration. They are curved or arched concavely toward the composite end wall formed by end flaps 21a/21b, 28a/28b, 30, 32a/32b. The weakened lines of severance 52, 54 begin from two adjacent upper corners of the carton respectively and intersect a frangible or otherwise weakened lines 55, 53 formed in the side end flaps 28a/28b, and 32a/32b to extend between the side walls 14 and 18 entirely across the composite end wall formed by end flaps 21a/21b, 28a/28b, 30, 32a/32b, thereby defining a retaining portion 28b/30/32b within the composite end wall 21a/21b, 28a/28b, 30, 32a/32b. This retaining portion 28b/30/32b prevents cans "C" from being undesirably shed from the lower and middle tiers of the array of cans.

The tight packing of the carton 60 and/or the rigidity of the composite top wall 12a/12b provides tension in the carton walls which may restrain the cans 'C' of the uppermost row from rolling free from the carton 60 when the opening provider 56 is first displaced or detached from the carton 60. The shape of the carton 60 upon removal of the opening provider 56 may also assist in retaining the end most can of the uppermost row within the carton 60 since the weakened lines of severance 48a/48b, 52 and 54 are routed through the two adjacent corners of the composite top wall next to the composite end wall formed from the end flaps 21a/21b, 30, 28a/28b, 32a/32b. Furthermore, the configuration of the weakened

lines 52, 53, 54, 55 provides an access opening which is shaped such that cans 'C' of the lowermost rows are restrained from rolling free from the carton 60 by the remaining portion 28b/30/32b of the composite end wall 21a/21b, 28a/28b, 30, 32a/32b. Access to the end most cans 'C' of the lower most rows is however readily accommodated by the shape of the weakened lines 52, 54 in the side wall panels 14, 18 which partially exposes the ends of said cans 'C' as shown in Fig. 3, so that a user can easily grasp an endmost can 'C' between a first finger and thumb for removal from the carton 60. The curvature of the tear lines 52, 54 helps to increase the exposed areas of the can ends. After the top, end-most can is removed from the upper tier, the remaining cans 'C' in the upper tier will nest in the spaces between the cans of the lower tier. Nesting of cans in this manner is well known in the art and is not illustrated. The invention serves as a useful dispensing carton that can be placed upon a surface or within a compartment such as a refrigerator or pantry.

Modifications may be made in the foregoing without departing from the scope of the claimed invention. For example, the opening provider may be formed at each end of the carton according to the invention. In other embodiments, the opening provider may be designed such that it is not fully detachable; the opening provider may remain hingedly connected to the remainder of the carton through the weakened lines 53 and 55 even after the weakened lines of severance 48a/48b, 52 and 54 are broken. In other words, the weakened lines 53 and 55 may function as fold lines or even actually formed of score lines. It should be also appreciated that as used herein, directional references such as "top", "bottom", "end", "side", "upper" and "lower" do not limit the respective panels to such orientation, but merely serve to distinguish these panels from one another.

It should be further appreciated that any reference to hinged or foldable 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 fold lines. In this application, a "fold line" includes, but is not limited to, a score line, a perforation, a line of short slits, a line of half cuts, a combination of slits and score lines, and similar arrangements, without departing from the scope of invention.

CLAIMS

1. A package comprising a carton and at least two rows of generally cylindrical articles accommodated in the carton, said carton comprising top and bottom panels interconnected by a pair of opposed side walls to form a generally tubular structure, and an end wall at each end of the tubular structure to at least partially close said each end, wherein one of said rows of said cylindrical articles is arranged to be in rolling contact with the bottom panel, ends of each of the articles being in abutment with the side walls of the carton respectively, the top panel comprises at least one stress relieving fold line, said carton further comprises an opening provider defined by a substantially continuous frangible connection comprising a series of weakened lines in the top panel, the side walls and one of the end walls, and the frangible connection is at least in part coincident with the at least one stress relieving fold line.

2. The package according to claim 1 wherein the weakened line in the top panel is coincident with the at least one stress relieving fold line.

3. The package according to claim 2 wherein the weakened line in the top panel is arched concavely toward an adjacent one of the end walls.

4. The package according to claim 3 wherein the weakened line in the top panel extends between a pair of corners of the top panel adjacent to said one end wall.

5. The package according to claim 1 wherein each of the weakened lines in the side walls extends between said top panel and said one end wall.

6. A carton for cylindrical articles comprising a generally tubular structure formed from a top panel, a bottom panel, and a pair of side walls connecting together the top and bottom panels, the carton further comprising an end wall at each end of the carton which at least partially closes the each end of the tubular structure and a handle provided by the top panel, wherein at least one end of the carton has an opening provider to allow removal of the articles, the opening provider being defined by a substantially continuous frangible

connection comprising a series of weakened lines in the top panel, the side walls and one of the end walls at said one end, the substantially continuous frangible connection being coincident at least in part with a stress relieving fold line provided for facilitating defining displacement of the top panel when the carton is lifted by the handle.

7. The carton according to claim 6 wherein the weakened line in the top panel is coincident with the stress relieving fold line.

8. The carton according to claim 7 wherein the weakened line in the top panel is arched concavely toward an adjacent one of the end walls.

9. The carton according to claim 8 wherein the weakened line in the top panel emanates from one of corners of the top panel adjacent to said one end wall and extends to the other of the corners of the top panel adjacent to said one end wall.

10. The carton according to claim 7 wherein the top panel is of multi-ply construction and is formed from two partially overlapping panels, the weakened line in the top panel being formed in part in each of the overlapping panels and configured such that the parts of the weakened line in the top panel are continuous when the two overlapping panels are overlapped.

11. The carton according claim 7 wherein the top panel further comprises a pair of hand apertures struck from the two overlapping panels respectively, the hand apertures being aligned with each other across an overlapping area of the top panel such that a reinforced carrying means is defined between the hand apertures.

12. The carton according to claim 6 wherein said one end wall comprises a pair of overlapping side end flaps and wherein weakened line in said one end wall extend between the side walls of the carton entirely across the side end flaps thereby defining a retaining portion of the end wall.

13. The package according to claim 5 wherein said weakened lines in the side walls are curved concavely toward said one end wall to partially expose opposite ends of an end most one of the articles in said one of said rows when the opening provider is detached from the carton.

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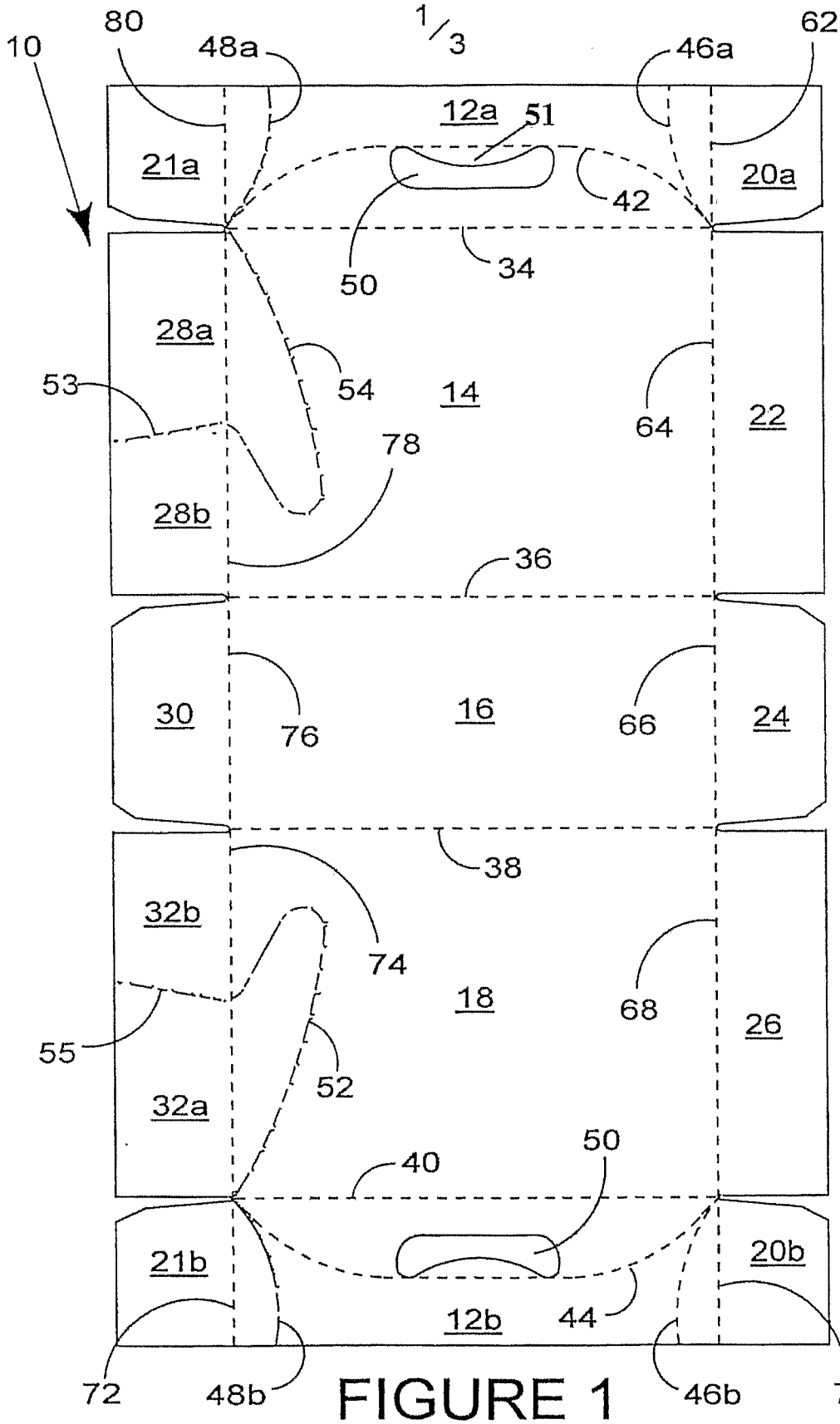
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FIGURE 1

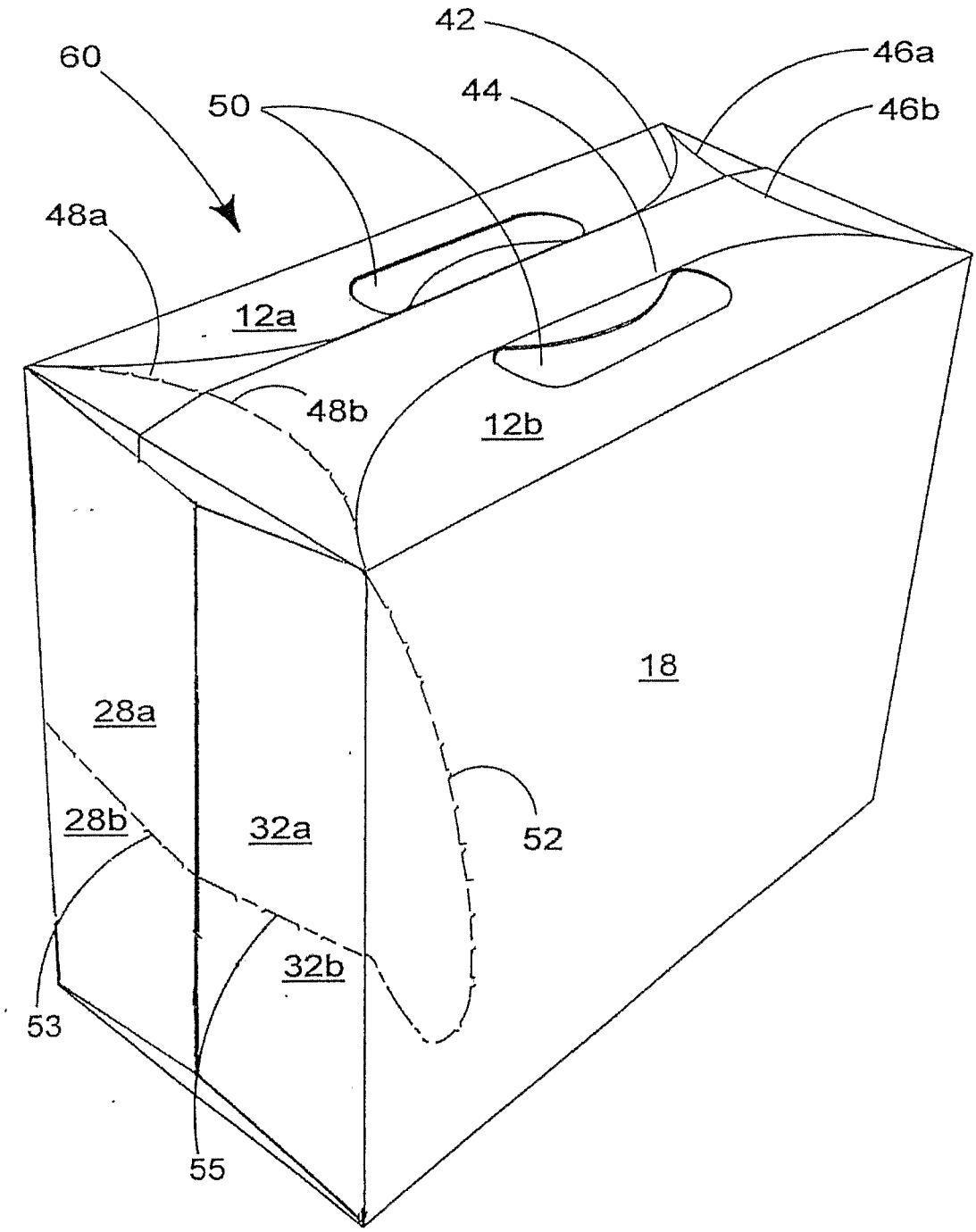


FIGURE 2

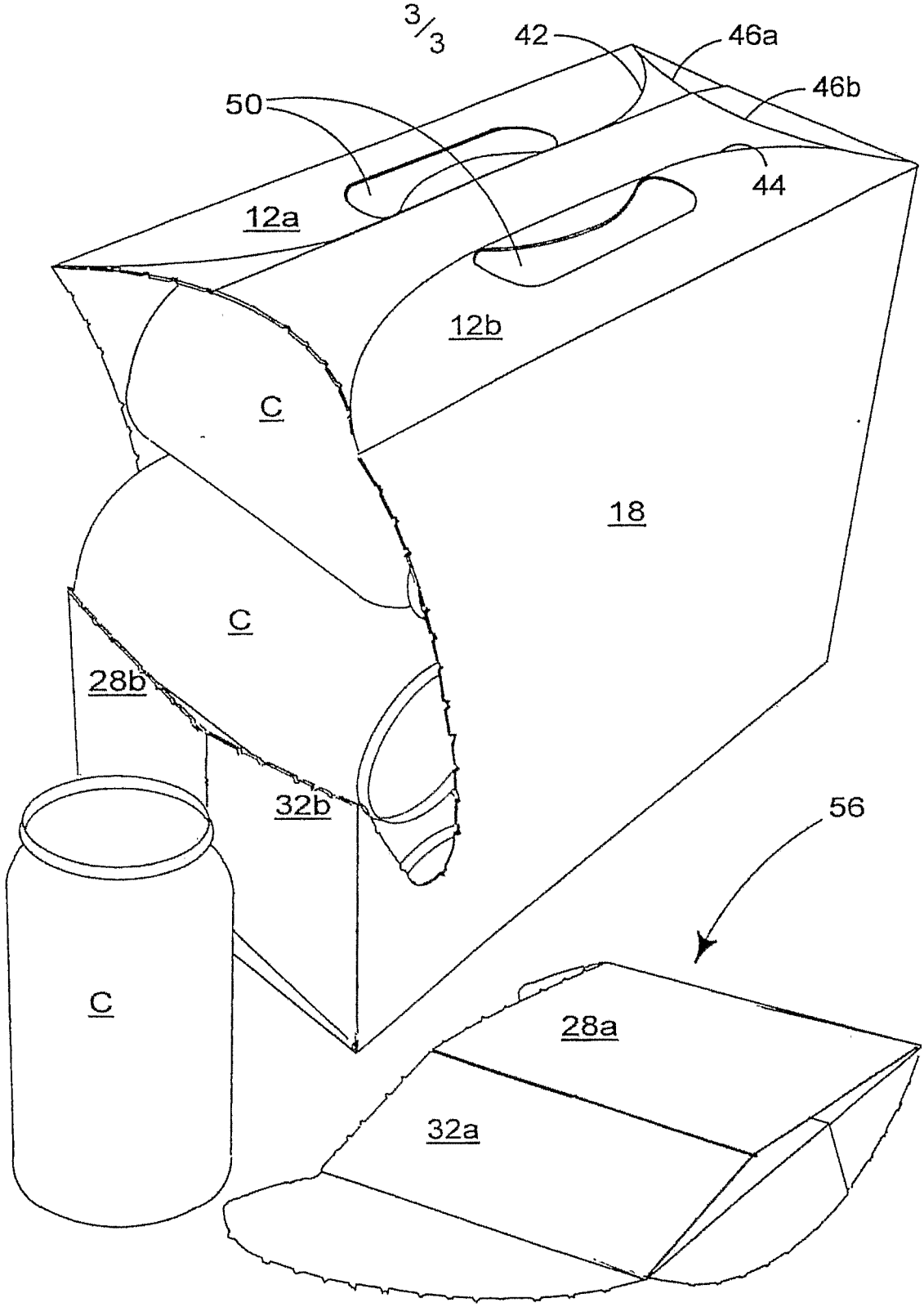


FIGURE 3

# INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/026409

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D71/00

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. |
|---|---|---|
| A | US 2004/188277 A1 (AUCLAIR JEAN-MICHEL [FR]) 30 September 2004 (2004-09-30) paragraph [0028]; figures | 1,6 |

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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

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| European Patent Office, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,<br>Fax: (+31–70) 340–3016 | Bridault, Alain |

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Information on patent family members

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