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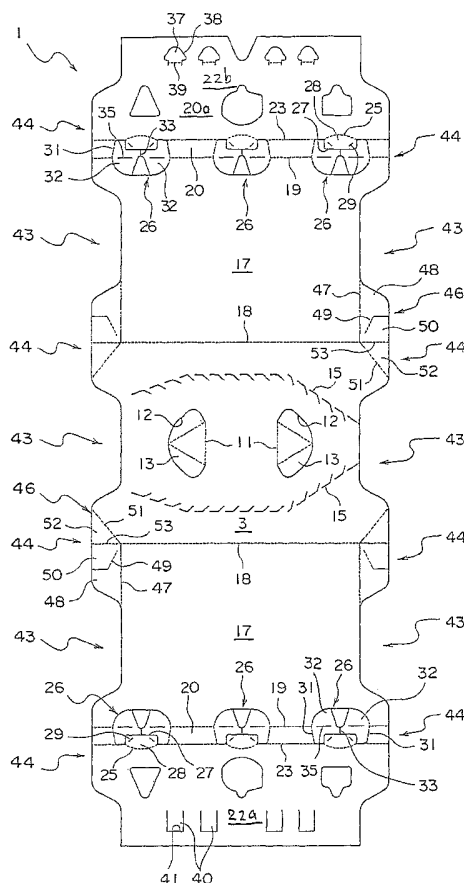
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[Continued on next page]

(54) Title: CARTON AND PACKAGE



(57) Abstract: A cartons for packaging a plurality of similarly dimensioned, cylindrical articles such as cans (5) and a package formed from the carton. The carton includes top (3) and bottom (24) opposed walls hingedly interconnected by a pair of side walls (17, 17) to form a tubular structure; and an article retaining structure for retaining one of the articles in the carton. The article retaining structure (26) includes an engaging tab (28) formed from, and hingedly connected to the top or bottom wall and folded inwardly of the tubular structure to engage the recess of an article, a supporting flap (32) formed from, and hingedly connected to, one of the side walls and folded inwardly of the tubular structure to engage the article, and an article receiving aperture defined at least partially by the engaging and supporting flaps to receive a first portion of the article. The supporting flap is engaged with a second portion of the article adjacent to the first portion of the article.



SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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.

Published:

— *with international search report*

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Carton and Package

Background of the Invention

5 This invention relates to a carton for packaging a plurality of similarly dimensioned cylindrical articles and to a package formed from such a carton. The invention particularly relates to a carton and a package wherein the articles are arranged in a unit in an optimal carton.

10 Cartons have been frequently used in the past to store, transport and sell articles such as cans, bottles or the like. Articles when packaged in a carton are gathered and arranged in a unit and accommodated in the carton. These cartons are typically made of paperboard or a similar material.

15 Some conventional cartons are of a wraparound style. A wraparound carton comprises top and bottom opposed walls hingedly interconnected by a pair of side walls to form a tubular structure. The opposite ends of the carton remain open. A typical example of the articles packaged in such a carton is six beverage cans arranged in 2 x 3 configuration. The carton is disposed along the exterior of the article unit or arrangement so that the articles are tightly
20 packaged in the carton.

Although such a wraparound carton is preferred to save carton material, since both the ends the carton may remain open. However, this necessitates a special construction for retaining the packaged articles in the carton so that undesired dislodging of articles through the open
25 ends are effectively prevented.

It is known as shown in Japanese Published Patent Application No. 61-47356 that peripheral wall engaging members can be used so as to engage some of the articles facing the open end of the carton. In this carton, it is possible to retain the packaged articles inside the carton
30 such that the packaged articles are prevented from being dislodged from or falling out of the carton.

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It is also known as shown in Japanese Published Patent Application No. 2003-34354 that a recess engaging tabs may be used to retain articles, such as cans, each having an end recess at its top and/or bottom. A recess-engaging tab may be folded inwardly of the carton to engage the end recess to retain the respective article.

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When the peripheral wall engaging members or the recess engaging tabs are used for a carton, there is a drawback such that an external physical impact given to a carton during its transport could cause dislodging or falling out of the packaged articles from through the open ends of the carton.

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Summary of the Invention

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A carton and a package is made to prevent dislodging and falling of the packaged articles from the its open ends even when the packaged articles are subject to an external physical impact.

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To achieve such a purpose, the carton of the present invention comprises top and bottom opposed walls hingedly interconnected by a pair of side walls to form a tubular structure, and an article retaining structure for retaining one of the articles in the carton. The article retaining structure comprises an engaging tab formed from, and hingedly connected to, one of said top and bottom walls and folded inwardly of the tubular structure to engage the recess at an end of the one article, a supporting flap formed from, and hingedly connected to, one of the side walls and folded inwardly of the tubular structure to engage the one article, and an article receiving aperture defined at least partially by the engaging and supporting flaps to receive a first portion of the one article. The supporting flap is engaged with a second portion of the one article adjacent to the first portion.

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The package of the present invention comprises a plurality of cylindrical articles each having a recess at one end of the respective article and the above-mentioned carton for packaging the articles.

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According to the carton and package of this invention, the recess-engaging tab is arranged to face the respective bottom of the associated article. The free end of the tab abuts on either the top or the bottom of the associated article. This allows the recess-engaging tab to vertically support associated article. The peripheral wall-supporting flap is brought into
5 contact with a portion of the side wall of the associated article adjacent to an article-receiving aperture. This allows the supporting flap to hold the associated article to prevent its horizontal movement. Thus due to the article retaining structure, the associated article is stabilized both vertically and horizontally within the carton. The article retaining structure also serves to create a buffer means between the carton walls and packaged articles. This
10 protects the packaged articles from an external physical impact that may be given to the carton during transport of the carton, a falling object and/or the like.

Brief Description of the Drawings

15 FIG. 1 is a plan view of a carton blank according to an embodiment of the present invention.

FIG. 2 is a fragmentary perspective view of a carton formed from the blank of FIG. 1, showing a plurality of articles in the carton depicted in phantom lines.

20 FIG. 3 is a fragmentary view taken along the line A – A in FIG. 2.

Detailed Description of the Preferred Embodiment

Referring to FIGS. 1 to 3, the carton and the package according to the present invention are
25 now described.

FIG. 1 shows a carton blank of one embodiment of this invention while FIG. 2 is a perspective view showing the package accommodating a plurality of articles. As shown in FIG. 1, the elongate blank 1 is formed from cardboard, corrugated board, plastic or similar
30 foldable sheet material. To make a tubular structure, the opposed end parts of the carton blank 1 are mutually connected or secured by means of a mechanical lock arrangement or

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suitable adhesive as described later in more details. The blank is formed into a tubular structure as shown in FIG. 2.

5 This carton blank 1 comprises a top wall 3, which has a roughly rectangular shape and is approximately at the central location along the length of the carton blank. The width and the length of the top wall 3 are such that the top wall 3 is suitable to accommodate a plurality of similarly dimensioned articles 5, such as beverage cans 5, arranged for example in a 2-by configuration such as a 2 x 3 configuration. In this case, each article 5 is generally of a cylindrical configuration. More particularly, each article 5 has a cylindrical side wall
10 extending between a circular top 6 and a circular bottom 7. The bottom 7 is configured to have a recess or concave portion 9. In this particular embodiment, the top wall 3 is designed for a can arrangement of a 2 x 3 configuration.

The top wall 3 includes a pair of finger tabs 13 hingedly connected to the top wall 3 along the
15 respective fold lines 11. These tabs 13 define finger openings in the top wall 3 by which the package formed from the carton may be lifted and/or carried. A pair of tear lines 15 are formed in the top wall 3 to define a removable portion in the top wall 3. Each tear line 15 extends from one end edge thereof to the other end edge so that when one end portion of the removable portion is held by user's fingers and pulled upward, the tear lines 15 are broken to
20 allow the removable portion to be separated from the top wall 3. This makes it possible to open in a simple manner the package unit 14.

To the side edges of the top wall 3, a pair of side walls 17 are connected along panel fold lines 18 respectively. The height of each side wall 17 is generally equal to or slightly greater
25 than the height of the articles 5.

Each side wall 17 include a beveled heel strip 20 disclosed along the lower edge of the respective side wall 17. The heel strip 20 is hingedly connected to the remainder of the respective side wall 17 along a fold line 19. The heel strip 20 is dimensioned and configured
30 such that in the erected carton, the heel strip is disposed at an angle with respect to the bottom wall 24 and alongside the tapered lower end portions of some of the packaged articles 5.

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Two bottom panels 22a, 22b are connected to the lower edges of the side walls 17 along fold lines 23, 23 respectively. When these bottom panels 22a, 22b are mechanically connected or glued to each other, a single bottom wall 24 is formed from the bottom panel and a tubular structure is formed from all the carton panels. The bottom panels 22a, 22b are configured and dimensioned such that multiple articles 5 arranged in the 2-by configuration may be accommodated in the carton.

After the side walls 17 are positioned opposite the associated articles 5, the heel strips 20 of the side walls 17 are folded to their respective beveled positions as shown in FIG. 2.

Immediately before the heel strips 20 take their beveled positions, each of article retaining means or structures 26 are activated to define article receiving apertures 30 for receiving the lower end portions of the articles 5. Because each article retaining structure 26 holds the lower end portion of the associated article 5, the articles 5 are prevented from being dislodged and falling out from the carton 4 through the open ends 10.

Each article retaining structure 26 includes a recess engaging tab 28 and a pair of supporting flaps 32, 32. Each supporting flap 32 is formed in part from the respective heel strip 20 and in part from the adjacent side wall 17. Each flap 32 is hingedly connected to the adjacent side wall 17 along a curved fold line 31 so that it may be folded inwardly of the carton. The recess engaging tab 28 is formed in part from the respective bottom panel 22a or 22b and in part from the associated pair of supporting flaps 32, 32 so that the recess engaging tab 28 is positioned between the supporting flaps 32. A U-shaped cut 29 separates the recess engaging tab 28 from the associated supporting flaps 32, 32. The recess-engaging tab 28 is hingedly connected to the respective bottom panel 22a or 22b along an arched fold line 25 so that it may be folded inwardly of the carton. In the blank of FIG. 1, the supporting flaps 32 are closely positioned via cut 27 to the adjacent engaging tab 28. Each tab 28 when folded is concavely warped due to the arched fold line 25, which locks the tab 28 in the folded position. As shown in FIG. 3, each folded engaging tab 28 is brought into contact with the bottom 7 or recess 9 of the associated article 5 to stabilize the associated article 5.

The supporting flaps 32 of each article retaining structure 26 are designed to be folded in the opposite directions such that each flap 32 is folded inwardly about 180 degrees onto the

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inside surface of the respective side wall 17. When in the folded position, each supporting flap 32 is disposed between the respective side wall 17 and adjacent article 5. It should be also appreciated that when folded during the carton assembly, each supporting flap 32 in corporation with the adjacent engaging tab 28 defines an article receiving aperture 30 in which a lower end portion of the associated article 5 is received. Each article-receiving aperture is formed in part in the respective side wall 17 and in part in the adjacent bottom panel 22a or 22b. When each supporting flap 32 is brought into contact with the inside surface of the adjacent side wall 17, it is at the same time brought into contact with the side of the associated article as well as its tapered lower end portion. Because of this, a three-dimensional supporting contact is achieved by each supporting flap 32 to prevent the article from horizontal movement.

Furthermore, although the supporting flaps 32 are formed in the present embodiment so that they are formed only from the respective side wall 17 which contains the inclined part 20, the invention is not limited by this embodiment. It is for example also possible to form each supporting flap 32 in part from the side wall 17 and in part from the adjacent bottom panel 22a or 22b.

Locking tabs 37 are struck from the bottom panel 22b while corresponding retaining tabs 40 are struck from the bottom panel 22a. The locking tabs and retaining tabs are provided to connect the bottom panels 22a, 22b together to form a single bottom wall 24 as mentioned above. The structure and function of these mechanical locking arrangements are well known in the art and therefore description there of is omitted. It should be appreciated that the locking means for the bottom panels 22a, 22b is not limited to the above-described locking arrangement. In place of the locking and retaining tabs 37, 40, any adhesive may be used to secure the bottom panels 22a, 22b together.

Cutouts 43 are formed along either end edge each of the top wall 3, side end walls 17 and bottom panels 22a, 22b. As a result, complementary protrusion 44 are formed along either longitudinal edge of the blank so that each protrusion is positioned in the region of the opposite ends of the respective panel fold line 18, 23.

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The shape and dimension of each cutout 43 positioned between the pair of adjacent protrusion 44 corresponds to the contour shape and dimension of each protrusion 44. This arrangement allows the blanks to be arranged with blanks of like structure in a nested fashion, which enables savings of the material used to provide the carton blank 1.

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As best shown in FIG. 1, some of the article-retaining structures 26 are formed in part from the respective protrusions 44. The other protrusions 44 from which no article retaining structure is formed are provided with different fold lines 47, 49, 53 and 51. These fold lines in each of the other protrusions allow the respective protrusion to be folded and erected into a
10 article retaining corner arrangement the details of which is disclosed in US Patent Application Publication No. 2004/0245326 A1, which is hereby incorporated by reference.

Modifications may be made in the foregoing without departing from the scope and spirit of the claimed invention. For example, each supporting flap may be formed in part from the
15 respective side wall and in part from the adjacent bottom panel according to the present invention. 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.

20 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 each hinged connection can be formed from one or more of the following, a score line, a line of perforations, a line of short slits, and a line of half-cuts, without departing from the scope of invention.

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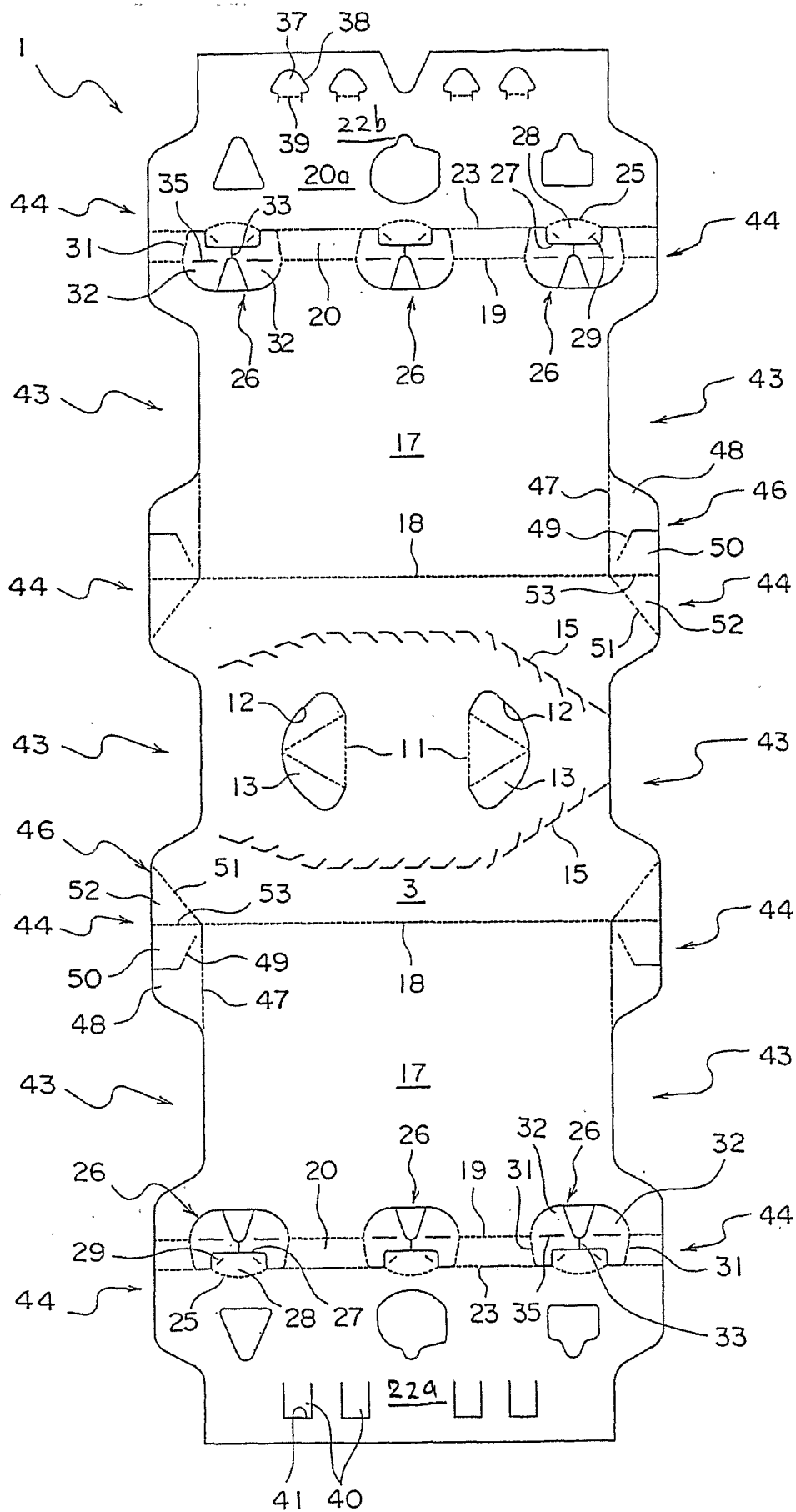
CLAIMS

1. A carton for packaging a plurality of cylindrical articles each having a recess at one end of said each article, comprising top and bottom opposed walls hingedly interconnected by a pair of side walls to form a tubular structure, and an article retaining structure for retaining one of said articles in said carton, said article retaining structure comprising:
- 5
- a) an engaging tab formed from, and hingedly connected to, one of said top and bottom walls and folded inwardly of said tubular structure to engage said recess of said one article,
- 10
- b) a supporting flap formed from, and hingedly connected to, one of said side walls and folded inwardly of said tubular structure to engage said one article, and
- 15
- c) an article receiving aperture defined at least partially by said engaging and supporting flaps to receive a first portion of said one article, said supporting flap being engaged with a second portion of said one article adjacent to said first portion.
- 20
2. A package comprising a plurality of cylindrical articles each having a recess at one end of said each article and a carton for packaging said articles, said carton comprising top and bottom opposed walls hingedly interconnected by a pair of side walls to form a tubular structure, and an article retaining structure for retaining one of said articles in said carton, said article retaining structure comprising:
- 25
- a) an engaging tab formed from, and hingedly connected to, one of said top and bottom walls and folded inwardly of said tubular structure to engage said recess of said one article,
- 30
- b) a supporting flap formed from, and hingedly connected to, one of said side walls and folded inwardly of said carton to engage said one article, and

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c) an article receiving aperture defined at least partially by said engaging and supporting flaps to receive a first portion of said one article, said supporting flap being engaged with a second portion of said one article adjacent to said first portion.

FIG. 1



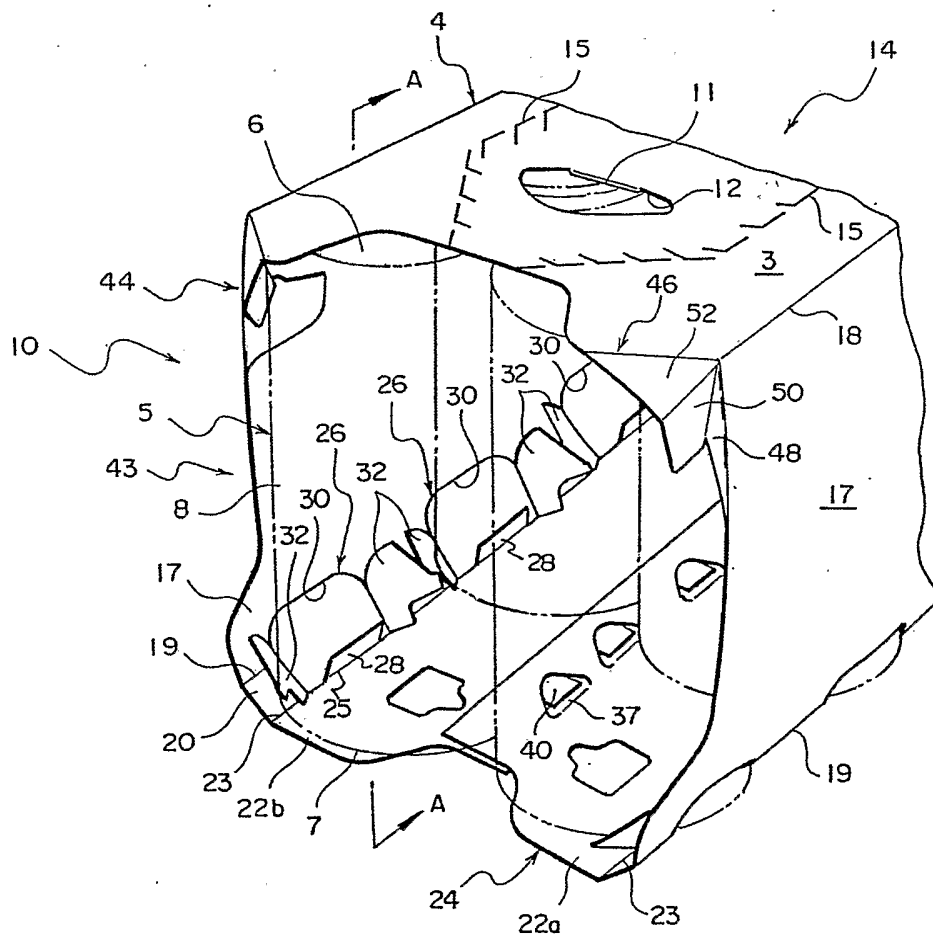


FIG. 2

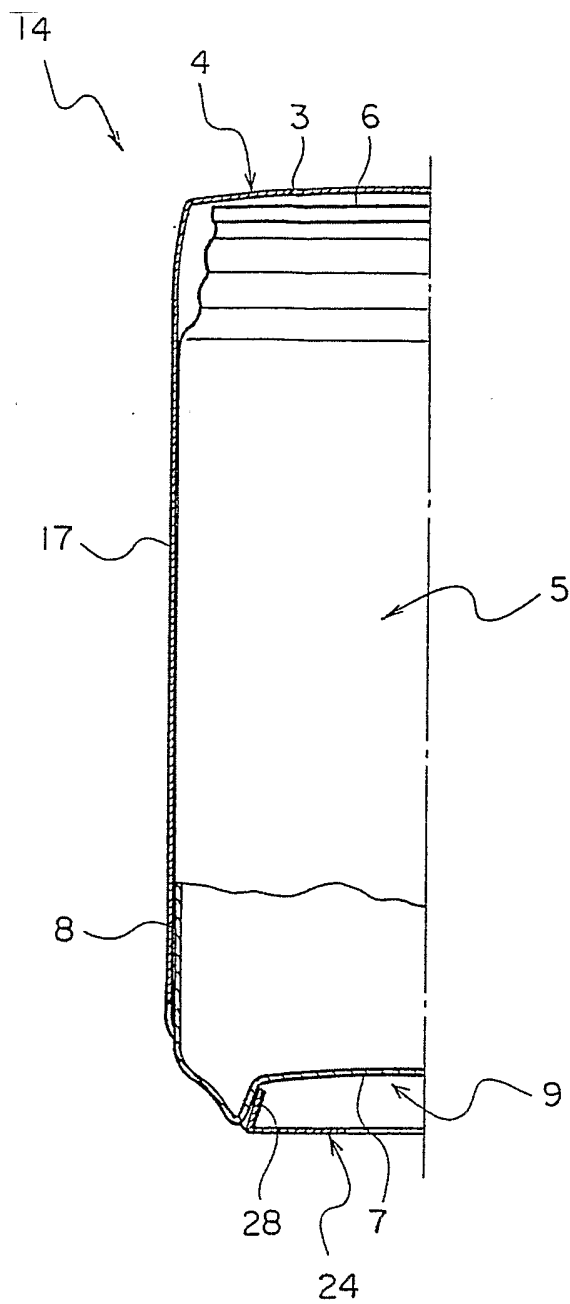


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2005/020523

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 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)

IPC 7 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	GB 1 265 553 A (THE MEAD CORPORATION) 1 March 1972 (1972-03-01) page 1, line 77 - page 2, line 126 page 3, line 19 - line 40; figures 1-4	1,2
X	WO 02/34641 A (RIVERWOOD INTERNATIONAL CORPORATION) 2 May 2002 (2002-05-02) page 3, line 1 - page 4, line 9; figures 1,2	1,2
A	WO 03/004375 A (THE MEAD CORPORATION; IKEDA, TAMIO) 16 January 2003 (2003-01-16) page 4, line 4 - page 5, line 13 page 7, line 27 - page 8, line 5; figures 1-6	1,2
A	US 5 520 283 A (SUTHERLAND ET AL) 28 May 1996 (1996-05-28) column 4, line 8 - line 47; figures 5,6	1,2

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

☒ Patent family members are listed in annex.

* Special categories of cited documents:

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

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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.

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Date of the actual completion of the international search

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10/10/2005

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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