CONTAINER WITH TAMPER-EVIDENCE, RECLOSURE FEATURES

A container (12) is provided from an integral blank (10) having a body portion, a cover (100) hingedly connected to the rear wall (30), and a locking device including a lock flap (407) hingedly connected to the top edge of at least one of the front wall panel (20) or a side wall panel (40, 50) and a lock flap receiving member (406) for receiving the lock flap when the cover is closed, wherein the lock flap receiving member is located on an inner surface of the cover front wall panel or at least one cover side wall panel, wherein the lock flap receiving member and lock flap are formed upon the initial separation of the cover front wall panel and cover side wall panels from the front wall panel and sidewall panels about a line of weakness (25) when the cover is first moved from a closed position to an open position.
Container with Tamper-Evidence, Reclosure Features

The present invention relates to folding carton containers. More particularly, it is concerned with a sealed container having a hinged cover that may be opened and subsequently reclosed, e.g., flip-top. Opening and closing engages the parts of the locking device that not only secures the cover to the container, but results in an audible noise as well. Additionally, the carton includes tamper evidence features.

Background of the Invention

Flip-top containers are known in the art. Such containers include a cover or top that is hingedly connected to the top edge of a wall of the container. It is also known that such containers may provide various locking mechanisms or devices for securing the cover to the container after the cover has been initially opened. In other words, after the seal affixing the cover to the container has been broken, the locking mechanism holds the cover in a closed position. Some representative cartons of this type are illustratively disclosed in U.S. Pat. Nos. 3,191,848, 3,378,188, 3,893,614, Reissue 26,471, 3,294,309, 3,295,742, 3,942,712, and 4,215,783.

Although numerous flip-top containers have been proposed, most suffer from various disadvantages and shortcomings. Such disadvantages include complex carton making equipment, difficulty in opening the cover due to, e.g., tearing, ripping, bowing, rough edges, and the like, extra tear strips, additional perforation or folding steps, poor protection of the contents of the container during transportation and warehouse stacking, unsatisfactory engagement of locking members found in the locking mechanism, e.g., too loose or too tight.

Thus, as seen, there is a need for a flip-top container that provides adequate protection during transportation and storage, yet easily and cleanly opens. What is also needed is a flip-top container that offers not only a reclosable cover, but provides tamper-evidence protection as well.

Summary of the Invention

One embodiment of the present invention is directed to a carton having a body portion having a front wall panel, a rear wall panel, side wall panels, and a bottom panel, a reclosable cover including a cover top panel hingedly connected to the rear edge of the rear wall panel, a cover front wall panel connected to the cover top panel,
and a pair of cover side wall panels connected to the cover front wall panel and the cover top panel, and a locking device having a lock flap hingedly connected to the top edge of at least one of the front wall panel or a side wall panel and a lock flap receiving member for receiving the lock flap when the cover is closed, wherein the lock flap receiving member is located on an inner surface of the cover front wall panel or at least one cover side wall panel, wherein the lock flap receiving member and lock flap are formed upon the initial separation of the cover front wall panel and cover side wall panels from the front wall panel and side wall panels about a line of weakness when the cover is first moved from a closed position to an open position.

Another embodiment of the present invention is directed to an integral blank suitably cut and scored for forming a container having a front wall panel, a rear wall panel, side wall panels, and bottom end flaps adapted to form a body portion, a means adapted to form a reclosable cover including a cover top panel hingedly connected to the rear edge of the rear wall panel, a cover front wall panel connected to the cover top panel, and a pair of cover side wall panels connected to the cover front wall panel and the cover top panel, and a locking device having a lock flap hingedly connected to the top edge of at least one of the front wall panel or a side wall panel and a lock flap receiving member for receiving the lock flap when the cover is closed, wherein the lock flap receiving member is located on an inner surface of the cover front wall panel or at least one cover side wall panel, wherein the lock flap receiving member and lock flap are formed upon the initial separation of the cover front wall panel and cover side wall panels from the front wall panel and side wall panels about a line of weakness when the cover is first moved from a closed position to an open position.

**Brief Description of the Drawings**

FIG. 1 is a plan view of a blank for forming the container of one embodiment of the present invention;

FIG. 2 is a plan view of the blank of FIG. 1 with the cover formed;

FIG. 3 is a perspective view of the closed container of one embodiment of the present invention; and

FIG. 4 is a perspective view of the open container of one embodiment of the present invention.
Detailed Description of the Invention

As used herein, the term "line of weaknesses" means an area of material that promotes or enhances separation of a unitary, or single, structure into at least two structures. As such, a line of weakness can be made using mechanical means, including, but not limited to, embossing, scoring, or cutting; or non-mechanical means, including, but not limited to, chemical etching; lasers, heat; or combinations of mechanical and non-mechanical means. In one embodiment, a line of weakness is a line of alternating cuts and land areas, e.g., perforations.

As used herein, the term "crease fold line" means an area of a structure that promotes or enhances bending, e.g., folding, without promoting separation, about the area. In an embodiment, a crease fold line may be half-cut, that is, the material may be cut halfway through to aid in bending or creasing. Alternately, in another embodiment the material may be scored to promote bending.

As used herein, the term "slit" means an area of material that is formed by a continuous cut. The material is separated completely from beginning of the line to end of the line.

According to the invention, a container is provided that is formed from an integral, e.g., a single or unitary, blank. The container of the present invention has a front wall panel, back wall panel, and side wall panels, a bottom panel, and a reclosable cover. The cover has cover top panel that is hingedly connected to the top edge of the rear wall panel, i.e., the edge furthest away from the bottom panel, a cover front wall panel connected to the cover top panel, and side wall panels connected to the cover top panel. At least one locking device is provided between a wall panel of the container and the cover. In an embodiment, the locking device includes at least one lock flap connected to or proximate to the top edge of a side wall panel and a corresponding lock flap receiving member for receiving the lock flap when the cover is closed, wherein the lock flap receiving member is located on an inner surface of the cover front wall panel or at least one cover side wall panel. The lock flap receiving member and lock flap are formed upon the initial separation of the cover front wall panel and cover side wall panels from the front wall panel and side wall panels about a line of weakness when the cover is first moved from a closed position to an open position. Upon moving the cover to a closed position, the lock flap becomes engaged with the corresponding lock flap.
receiving member. Usually an audible noise is heard whenever the lock flap and the corresponding lock flap receiving member are engaged or disengaged.

Also provided by the present invention is at least one recess for relieving stress caused by the overlapping of the cover over the top of the body portion of the container when the cover is closed. The location of the recess should be at the upper portion of each corner between the front wall panel and the side wall panels of the body of the container. While the particular shape of the recess is not important, each recess should have spaced apart sides and extending from an upper marginal edge of the container panels thereinto a given length. The length of the recess may be a substantial proportion of the width of the cover front wall panel and the cover side wall panels.

The initial opening of the unopened container is begun by lifting the front portion of the cover and pulling towards the top of the cover. The opening of the container for the first time results in breaking the lines of weakness between the cover and upper edges of the front and side panels, thereby creating a tactile, audible or visual cue that the container has been opened for the first time. Any break or other discontinuity along the line of weakness between the cover and upper walls, diminishes or eliminates the tactile, audible or visual cue when the container is opened. If the container was not previously opened, e.g., is new, and the tactile, audible or visual cue is diminished or is absent, then there is evidence of possible package tampering.

A representative, non-limiting list of materials useful in constructing the container of the present invention, includes corrugated board (polymeric, paper, and the like), paperboard, paper laminations, chipboard, polymeric sheeting, foam board, and combinations thereof. One type paperboard particularly useful in constructing a container of the present invention is 16pt or 250 g/m2 paperboard, solid bleach sulfate (SBS) or recycled paperboard. If corrugated board is used, E-flute corrugation is particularly useful.

Types of adhesive useful in the present invention include solvents, hot melt or cold glue adhesives and known in the industry and can be applied by any known method, including but not limited to spraying, rolling, or transfer methods.

The container of the present invention is useful for shipping, storing, and displaying a wide range of articles, including, but not limited to, articles that stand upright, e.g., writing instruments, such as, pens, pencils, markers, crayons and the like,
disposable absorbent articles, such as pantiliners, sanitary napkins, adhesive bandages, and the like, hair care products, baby products; and pharmaceutical products, beverage containers. Articles placed in the container of the present invention may be individually packaged, or packaged in groups of at least 2 articles. The individual packaging may be in the form of bottles, cans, pouches, sachets, bags, boxes, tubes, flow wraps, and the like. The container of the present invention may contain a single row of articles, multiple rows of articles or be randomly bulk filled.

The container of the present invention may optionally contain graphics. Graphics on the outwardly disposed surfaces may illustrate preferred opening instructions, the contents contained therein, how the articles relate to a system in which multiple articles can be combined for use according to various uses and needs. Additionally, the inside of the carton may also be printed with patterns, graphics, etc.

Referring to FIG. 1, an integral blank 10 as shown is suitably cut and scored to form container 12 (shown in FIGs. 3 and 4) according to the invention. Integral blank 10 includes rear wall panel 30 connected to first side wall panel 40 by crease fold line 38; first side wall panel 40 is connected to front wall panel 20 by crease fold line 48; and front wall panel 20 is connected to second side wall panel 50 by crease fold line 28. Additionally, second side wall panel 50 is joined longitudinally along crease fold line 58 to gluing inner panel 51. In another embodiment not shown in FIG. 1, a glue panel may be longitudinally connected to rear wall panel 30.

Front wall panel 20 is connected to cover top portion 104 by line of weakness 23 and to bottom portion 114 by crease fold line 26. Bottom portion 114 is a major glue flap.

Rear wall panel 30, it is connected to rear cover portion 108 by crease fold line 34 and to rear bottom portion 118 by crease fold line 36. Both rear cover portion 108 and rear bottom portion 118 are major glue flaps.

First side wall panel 40 is connected to first cover side portion 102 and to bottom side portion 112. Crease fold line 46 separates front side wall panel 40 from bottom side portion 112. Likewise, second side wall panel 50 is connected to second cover side portion 106 and to bottom side portion 116. Crease fold line 56 separates second side wall panel 50 from bottom side portion 116.
In the embodiment shown in FIG. 1, first cover side portion 102 and second cover side portion 106 have, like cover top portion 104, three sections that are in a lateral relationship to each other; cover sections 402, 404, and 406 for first cover side portion 102 and cover sections 502, 504, and 506 for second cover side portion 106.

Turning to first cover side portion 102, first cover section 402 is connected to second cover section 404 by crease fold line 42. First cover section 402 forms a minor glue flap. Second cover section 404 is connected to third cover section 405 by crease fold line 44. Third cover section 405 is suitably cut and scored to form the components for at least one locking device, lock flap 407 and lock flap receiving member 406. Line 45 connects third cover section 405 to first side wall panel 40. Line 45 is depicted in FIG. 1 as having three sections, perforated sections 45a and 45b and crease fold line section 45c. Lock flap 407 is defined by crease fold line section 45c, line of weakness 47a, slit 47b, and slit 47c. Lock flap receiving member 406 is defined by line of weakness 45a, line of weakness 45b, slit 47b, line of weakness 47a, and slit 47c. Slits 47b and 47c represent cuts or a discontinuous surface in which the material forming locking member 406 is separated.

In second cover side portion, first cover section 502 is connected to second cover section 504 by crease fold line 52. First cover section 502 forms a minor glue flap. Second cover section 504 is connected to third cover section 505 by crease fold line 54. Third cover section 505 is suitably cut and scored to form the components for at least one locking device, lock flap 507 and lock flap receiving member 506. Line 55 connects third cover section 505 to first side wall panel 50. Line 55 is depicted in FIG. 1 as having three sections, perforated sections 55a and 55b and crease fold line section 55c. Lock flap 507 is defined by crease fold line section 55c, line of weakness 55a, slit 57b, and slit 57c. Lock flap receiving member 506 is defined by line of weakness 55a, line of weakness 55b, slit 57b, line of weakness 57a, and slit 57c. Slits 57b and 57c represent cuts or a discontinuous surface in which the material forming locking member 506 is separated.

Cover top portion 104 has three sections 204, 206, and 208 in lateral relationship to each other. First cover section 204, a major glue flap, is connected to second cover section 206 by crease fold line 22. Second cover section 206 is connected
to third cover section 208 by crease fold line 24. As described above, cover portion 104 is connected to front wall panel 20 via third cover section 208 by line of weakness 23.

The cover portions 102, 104 and 106 are interconnected. For example, second cover section 404 is connected to second cover section 206 by crease fold line 408.

Second cover section 504 is connected to second cover section 206 by crease fold line 508.

Although not required, first cover section 204 may have a larger surface area than first side cover portion 102 and second cover side portion 106. Additionally, rear cover portion 108 may have edges that are angled and extend upwardly toward its central portion for connecting to first cover section 204. Such connection may be by method known to those skilled in the art, such as, adhesive gluing, solvents, stapling, heat sealing, hot melt, and the like.

Optionally, recesses or slots 60 and 70 are provided at the upper portion of each corner between the front wall panel 20 and the side wall panels 40 and 50. Recesses 60 and 70 have spaced apart sides and extend from an upper marginal edge of the panels 20, 40, and 50 thereof over to a given length to relieve stress caused by placing the cover 100 (FIG. 3) over the of the body portion of the container when the cover 100 is closed. The length of the recesses 60 and 70 may be a major proportion of the width of the cover walls, that is, the width of the walls formed by folding over second cover sections 404, 206 and 504 over the third wall sections 208, 406, and 506. The recesses may be almost equal to the width of the cover sections in order to provide as much relief as possible, but for aesthetic purposes, may be slightly shorter, so that when the container is assembled, the second cover sections 206, 404, and 504 hide or obscure the recesses 60 and 70.

FIG. 2 depicts the formation of the front and sides of the cover 100. Cover 100 is formed by Z-folding first cover side portion 102, cover top portion 104 and second cover side portion 106, third cover section 405, third cover section 208 and third cover section 505 are forward folded along line 45, line of weakness 23, and line 55 so that they are juxtaposed against first side wall panel 40, front wall panel 20, and second side wall panel 50, respectively. Adhesive is added to the inner surfaces of third cover sections 405, 208 and 505. The adhesive may be applied in any pattern. Second cover
section 404, second cover section 206 and outer second cover section 504 are folded back onto the adhesive, thereby sealing the inside surfaces to create an overlap.

To finish forming the cover, the container must be formed. The integral blank 10 is folded along crease fold lines 38, 48 and 28 with inner panel 51 adhered to inside of rear wall panel 30. Bottom side portions 112 and 116 are folded inward along crease fold lines 46 and 56. Adhesive is applied to the major glue flaps and rear bottom portion 118 and bottom portion 114 are folded inward and joined together. The adhesive may be applied in any pattern.

Cover 100 is then formed by folding first cover section 402 and first cover section 502 inward. Adhesive is added to back cover portion 108 in any pattern, but must also be applied to expose areas of first cover sections 402 and 502. First cover section 204 is then secured to back cover portion 108. In one embodiment, two strips of adhesive is applied to the outer surface of back cover portion 108, and to side cover portions 102 and 106, the strips being parallel to crease fold line 34.

In an embodiment, the outer surface 53 of panel 51 and the inner surface of rear wall panel 30 (not shown) are secured together by attachment means.

Wherever glue or adhesive is used, other methods of adhering may be used, including tape, snap, button, hook and loop, stapling, heat sealing, solvents, hot melt, and the like. Adhesive or glue may be applied in areas on the major and minor flaps.

In an embodiment, the cover is formed with a double layer overlap.

The outer surface of wall panels 30, 40, 20 and 50 may be printed. Additionally, the inner surface may also be printed.

In one embodiment, when to container is opened, e.g., the cover is lifted away from the body of the container, for the first time, lines of weakness 45a, 45b, 47a, 23 and 55a, 55b, and 57a become separated. An audible noise can be heard upon the tearing of the land areas of the perforation lines. Presence of the audible noise when the container is first opened indicates that the container has not been previously opened, thereby providing a tamper evidence feature.

A grasping member may be optionally employed to aid in the opening of the container cover 100. If a grasping member is used, it is may be located in a central location (e.g., central portion of second cover section 206); this allows separation to begin from a central position. A person can engage the grasping member and begin
separation of the container top cover 100 from the body portion of the container. The grasping member should be of sufficient size and geometry to readily receive at least one human finger. Various other tools, such as a hook, can be inserted into grasping member for separating the container top section 100 from the container body portion. As the opening of the container requires some force to tear the lines of weaknesses, it may be desirable to use a heavy or rigid material for grasping member to prevent tearing. In a one embodiment, the second cover section 206 is adhered to the inner surface of third cover portion 208 to provide thickness and support. The grasping member may be straight, ovoid shape, any convex or concave shape.

Additionally, upon initial opening of the container, the lock flap and lock flap receiving member are formed. For example, lock flap 407 articulates along crease fold line 45c. Upon closure of cover 100, lock flap 407 engages lock flap receiving member 406, which is attached to second cover section 404, resulting in an audible sound, e.g., a click or a snap. Similarly, lock flap 507 engages lock flap receiving member 506, which is attached to second cover section 504. Upon the closing of the cover, the audible sounds created by the engagement of the lock flap and the lock flap receiving member should occur at about the same time. Likewise, upon opening of the cover, another audible sound occurs as lock flaps 407 and 507 disengage from lock flap receiving members 406 and 506, respectively. It is important that 45c and 55c not tear upon the initial opening of the container as the area immediately above crease fold lines 45c 55c is second locking members 407 and 507.

Cover 100 (shown FIGs. 3 and 4) is formed from cover portions 102, 104 106 and 108. Container bottom 120 is formed from bottom portions 112, 114, 116, and 118. Container cover portions and container bottom portions can also be referred to as flaps.

FIG. 3 shows container 12 fully assembled and unopened. Cover 100 forms a discontinuous surface with front wall panel 20. Upon initial opening of the container by lifting cover 100 and separating the cover 100 as described above results in cover 100 being hingedly connected about crease score line 34 to rear wall panel 30.

In an embodiment, second cover sections 206, 404, and 504 are approximately equal in width to front wall panel 20 and side wall panels 40 and 50, respectively.
Additionally, there may be additional or alternate glue flap panels. A narrow panel may be connected to the inner or outer surface of rear wall panel 30.

In an embodiment, crease fold line 24 forms an edge that may be lifted when opening the cover. In one embodiment, as shown in FIGs. 1-4, crease fold line 24 is straight.

While FIGs. 1-4 show an embodiment in which crease fold line 24 is straight, it is not necessary. For example, crease fold line 24 may have a cut out shape, e.g., sigmoidal-shaped, circular, ovoid, square, triangle, rectangle, or any other shape desired. The cut-out shape may be place anywhere along crease fold line 24. Usually, the cut-out shape is in the center of crease fold line 24. In addition, crease score line 24 may be in any shape that promotes folding along crease fold line 24 that does not interfere with opening and reclosing function.

Container bottom section 120 (seen in FIGs. 3 and 4) is formed from a plurality of bottom portions 112, 114, 116, 118. Bottom side portions 112 and 116 are articulated inwardly along crease score lines 46 and 56, respectively. In one embodiment, bottom side portions 112 and 116 have a smaller surface area than bottom portions 114 and 118, respectively, and rear bottom portion 118 is secured to the inner surface of bottom portion 114.

FIG. 4 shows carton 12 after initial opening. Lines of weaknesses 45a, 45b, 47a, 23, 55a, 57a, and 55b have been broken and no longer exist.
What is claimed is:

1. A container comprising:
   A) a body portion having a front wall panel, a rear wall panel, side wall panels, and a bottom panel,
   B) a reclosable cover comprising
      i. a cover top panel hingedly connected to the rear edge of the rear wall panel,
      ii. a cover front wall panel connected to the cover top panel, and
      iii. a pair of cover side wall panels connected to the cover front wall panel and the cover top panel, and
   C) a locking device comprising
      i. a lock flap hingedly connected to the top edge of at least one of the front wall panel or a side wall panel and
      ii. a lock flap receiving member for receiving the lock flap when the cover is closed, wherein the lock flap receiving member is located on an inner surface of the cover front wall panel or at least one cover side wall panel, wherein the lock flap receiving member and lock flap are formed upon the initial separation of the cover front wall panel and cover side wall panels from the front wall panel and side wall panels about a line of weakness when the cover is first moved from a closed position to an open position.

2. A container of claim 1, further comprising a recess provided at the upper portion of each corner between the front wall panel and the side wall panels of the body of the carton, each recess having spaced apart sides and extending from an upper marginal edge of said panels thereinto a given length to relieve stress caused by the overlapping of the cover over the top of the body portion of the carton when the cover is closed.

3. A container of claim 1, wherein the line of weakness comprises a line of perforations or a line of slits.
4. A container of claim 2, wherein the line of weakness comprises a line of perforations or a line of slits.

5. A container of claim 1, wherein the cover front panel comprise a means for grasping the cover front panel.

6. A container of claim 2, wherein the cover front panel comprise a means for grasping the cover front panel.

7. A container of claim 1, wherein when the cover is closed the lock flap is engaged by the lock flap release member, wherein an audible noise is made.

8. A container of claim 2, wherein when the cover is closed the lock flap is engaged by the lock flap release member, wherein an audible noise is made.

9. An integral blank suitably cut and scored for forming a container comprising:
   A) a front wall panel, a rear wall panel, side wall panels, and bottom end flaps adapted to form a body portion,
   B) means adapted to form a reclosable cover comprising
      i. a cover top panel hingedly connected to the rear edge of the rear wall panel,
      ii. a cover front wall panel connected to the cover top panel, and
      iii. a pair of cover side wall panels connected to the cover front wall panel and the cover top panel, and
   C) a locking device comprising
      i. a lock flap hingedly connected to the top edge of at least one of the front wall panel or a side wall panel and
      ii. a lock flap receiving member for receiving the lock flap when the cover is closed, wherein the lock flap receiving member is located on an inner surface of the cover front wall panel or at least one cover side wall panel, wherein the lock flap receiving member and lock flap are formed upon the initial separation of
the cover front wall panel and cover side wall panels from the front wall panel and side wall panels about a line of weakness when the cover is first moved from a closed position to an open position.

10. A blank of claim 9, further comprising a recess provided at the upper portion of each corner between the front wall panel and the side wall panels of the body of the carton, each recess having spaced apart sides and extending from an upper marginal edge of said panels thereinto a given length to relieve stress caused by the overlapping of the cover over the top of the body portion of the carton when the cover is closed;

11. A blank of claim 9, wherein the line of weakness comprises a line of perforations or a line of slits.

12. A blank of claim 10, wherein the line of weakness comprises a line of perforations or a line of slits.

13. A blank of claim 9, wherein the cover front panel comprise a means for grasping the cover front panel.

14. A blank of claim 10, wherein the cover front panel comprise a means for grasping the cover front panel.

15. A blank of claim 9, wherein when the cover is closed the lock flap is engaged by the lock flap release member, wherein an audible noise is made.

16. A blank of claim 10, wherein when the cover is closed the lock flap is engaged by the lock flap release member, wherein an audible noise is made.
# INTERNATIONAL SEARCH REPORT

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC 7** B65D5/54

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

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<td>Y</td>
<td>EP 0 392 737 A (PHILIP MORRIS) 17 October 1990 (1990-10-17) abstract; figures</td>
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<td>FR 2 686 316 A (NICOLLET HUGUES SA) 23 July 1993 (1993-07-23) abstract; figures</td>
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Further documents are listed in the continuation of box C.  

Patent family members are listed in annex.

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Date of the actual completion of the international search  

9 February 2004

Date of mailing of the international search report  

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Name and mailing address of the ISA  

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