Title: SEALLED CONTAINER OUTLET WITH DETACHABLE MEMBER

Abstract: An outlet assembly for a carton is provided, comprising a flanged member sealably attached to an interior side of the carton, the flanged member having an outlet formation that projects through an outlet hole in the carton, and a cap member mounted on an exterior side of the carton, the cap member having a cover formation that generally fits over the outlet formation. The outlet formation has a detachable member. An inner surface of the cover formation is sealed to the detachable member, such that when the cap member is lifted from the outlet formation, it tears away the detachable portion from the remainder of the outlet formation, thereby forming an outlet opening for the carton.

FIG. 8
SEALED CONTAINER OUTLET WITH DETACHABLE MEMBER

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority to United States provisional application Serial No. 60/935,622 filed August 22, 2007, the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] The invention is directed to an improvement in outlets for sealed containers, such as the outlets that are used in cartons for milk, juice, and the like.

[0003] Milk, juice and other liquids are commonly supplied in gable top cartons having an outlet assembly in the form of a plastic screw-on cap combination. The outlet assembly has a threaded nozzle member sealed onto one of the slanted gables of the carton and an unattached screw-on cap. This screw-on cap combination is injection molded and is costly to make and to install.

[0004] More specifically, these outlet assemblies commonly consist of a threaded screw on plastic cap member threaded onto a threaded outlet member having a detachable portion. The threaded outlet member has a flange that is sealably attached to the inside surface of the gable, with a threaded tubular portion of the threaded outlet member passing through a hole in the gable. The detachable portion is commonly at the top of the threaded tubular portion and attached to a molded plastic ring. The threaded screw-on plastic cap member is screwed onto the threaded tubular portion of the threaded outlet member. To open the carton the cap is first unscrewed and a finger is placed in the ring which by pulling the ring tears the detachable
portion out of the unit. This rather costly assembly was developed because the gable top carton must have, of course, an outlet hole, and this hole, when cut in to its gable, has a raw edge, unlike the rest of the carton which is coated with a film of polyethylene in order not to absorb the milk or other product contained which could sour or deteriorate with age. The outlet assembly isolates the raw edge with its sealed flange.

[0005] U.S. Patent No. 6,415,939 B1 describes and illustrates some prior inventions of the inventor of this application and is incorporated by reference herein. That patent discloses a small plastic unit which can be readily sealed or adhesively attached to various cartons, over a pre-made hole. It may be made of high density polyethylene, polyester, or other suitable plastic films. It is very low in cost. FIGS. 57A through 57D of that patent show a unit 2200 that may be made of thermoformed plastic and sealed over a hole on a carton. The unit 2200 has a lower formation 2210 and a cap member 2208. The lower formation 2210 has a detachable member in the form of a breakaway tip 2202 which is sealingly attached to the upper inner surface 2206 of the cap member 2208. The first time that the unit 2200 is opened by lifting the cap member 2208, the detachable member 2202 is automatically broken away from the lower formation 2210 at a fault line intersection between the tip 2202 and the remainder of the lower formation 2210. When the detachable member 2202 is broken away from the remainder of the lower formation 2210, an aperture or outlet 2216 is created. The detachable member 2202 remains sealed to the inside of the cap 2208, which may be used normally to recap the aperture or outlet 2216 and then removed to open the outlet for dispensing or pouring out the contained product.

[0006] As shown in FIGS. 59A and 61A of U.S. Patent No. 6,415,939 B1, it can be seen that in the case of the gable top carton the outlet unit 2200, 2400 is sealed to the outer
surface of the gable top. While the outlet units disclosed in U.S. 6,415,939 B1 are advantageous, the current invention provides a further improvement.

BRIEF SUMMARY OF THE INVENTION

[0007] This new invention improves the underlying inventions shown in U.S. 6,415,939 B1 by dividing the unit into two members and by eliminating the hinge and providing a cap which fits over the formation containing a breakaway tip or formation to which it is sealed.

[0008] The cap may have any one of a variety of extensions, handles etc. by which it may be pulled off the lower formation whereby it will tear out the breakaway tip (formation) which will remain sealed to its interior and act as a plug to help the closure greatly lowering its cost.

[0009] In certain embodiments, the current invention provides an outlet assembly of at least two members, one of which is a flanged member sealably attached to the interior side of the carton and having an outlet formation that projects through an outlet hole in the carton, and the other of which is a cap member mounted on the exterior side of the carton. The outlet formation on the flanged member has a score or fault line on the top of the outlet formation defining a detachable member like a breakaway tip. The cap member has a cover formation that fits over the outlet formation of the flanged member. An inner surface of the cover formation is sealed to the detachable member such that removing the cap member from the outlet formation tears away the detachable portion, thereby opening the carton.

[0010] Embodiments such as those described above provide a further improvement over the outlet units disclosed in U.S. Patent No. 6,415,939 B1. In that patent, because the outlet unit is sealed only to the exterior surface of the carton, it does not cover the
edge of the opening in the carton. Accordingly, if this edge is uncoated or unsealed, the liquid from the carton would be exposed to the raw edge of the paperboard, which would be unacceptable, since if it were milk it would sour and other products deteriorate. With the current invention, the outlet assembly itself seals off the liquid from the raw edge of the paperboard.

[0011] Further advantages of the invention will become clear from the following description and associated figures.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0012] Figure 1A shows a cap member for an outlet assembly according to an embodiment of the invention.

[0013] Figure 1B shows a top view of the cap member of Figure 1A.

[0014] Figure 1C shows a cross-sectional view of the cap member of Figure 1A.

[0015] Figure 2A shows a flanged member for an outlet assembly according to an embodiment of the invention.

[0016] Figure 2B shows a top view of the flanged member of Figure 2A.

[0017] Figure 2C shows a cross-sectional view of the flanged member of Figure 2A.

[0018] Figure 3A shows an outlet assembly with the cap member of Figure 1A assembled onto the flanged member of Figure 2A.

[0019] Figure 3B shows the outlet assembly of Figure 3A with a view of inside elements shown in phantom lines.

[0020] Figure 3C shows a cross-sectional view of the outlet assembly of Figure 3A.
Figure 4 shows an outlet assembly similar to that shown in Figure 3A, with a handle member.

Figure 5 shows an outlet assembly according to an embodiment of the invention comprising a flanged member and a cap member prior to mounting on a carton.

Figure 6 shows an outlet assembly according to an embodiment of the invention mounted on a gable top carton.

Figure 7 shows a cross-sectional view of the outlet assembly of Figure 2 mounted on the carton.

Figure 8 shows the outlet assembly of Figure 2 after hinging open the cap member, thereby opening the outlet.

Figure 9 shows a cross-sectional view of another embodiment of the invention.

Figure 10 shows a cross-sectional view of another embodiment of the invention.

DETAILED DESCRIPTION

Figures 1A-3C show an outlet assembly made, for example, of plastic, and comprising a flanged member 2 and a cap member 3. The flanged member 2 in this embodiment resembles a hat and has a projecting outlet formation and a brim or flange. The outlet formation on the flanged member 2 has a score or fault line 5 on the top of the outlet formation defining a detachable member 4 like a breakaway tip. The detachable member 4 is that portion of the outlet formation that is inside the score or fault line 5. The score or fault line...
5 may be a continuous or broken line of thinned material, creating an area of weakness at which the material may be easily torn.

[0029] The cap member 3 has a cover formation that generally fits over the outlet formation of the flanged member 2. An inner surface of the cover formation is sealed to the outer surface of the detachable member 4. It will be appreciated that the seal between the inner surface of the cover formation and the outer surface of the detachable member may be made in any suitable manner, for example by heat sealing or by suitable adhesives.

[0030] Figure 4 shows an outlet assembly similar to that shown in Figure 3A, with a handle member 6.

[0031] Figure 5 shows an outlet assembly 10 made, for example, of plastic, and comprising a flanged member 20 and a cap member 30. The flanged member 20 in this embodiment resembles a hat and has a projecting outlet formation 22 and a brim or flange 24. The outlet formation 22 on the flanged member 20 has a score or fault line 26 on the top of the outlet formation defining a detachable member 28 like a breakaway tip. The detachable member 28 is that portion of the outlet formation 22 that is inside the score or fault line 26. The score or fault line 26 may be a continuous or broken line of thinned material, creating an area of weakness at which the material may be easily torn.

[0032] The cap member 30 has a cover formation 32 that generally fits over the outlet formation 22 of the flanged member 20. The cap member 30 in the embodiment illustrated in Figure 5 has a lifting flap 34 extending from the cover formation 32. The lifting flap 34 in the embodiment illustrated in Figure 5 is substantially flat and is designed to lie substantially flat against the outer surface of a carton when the outlet assembly is closed.
Figure 6 shows the outlet assembly 10 mounted on a gable top carton 40, and Figure 7 shows a cross-sectional view of the outlet assembly 10 of Figure 6. As can be seen in Figure 7, the flange 24 of the flanged member 20 is sealed to the interior side of the carton. The outlet formation 22 projects through an outlet hole 42 in the carton.

The cap member 30 is mounted on the exterior side of the carton 40. In this illustrated embodiment, the cap member 30 is mounted to the carton 40 in a hinged manner. A tab member 36 is sealed to an exterior surface of the carton, and a hinge line 38 exists between the tab member 36 and the lifting flap 34.

An inner surface of the cover formation 32 is sealed to the outer surface of the detachable member 28. The seal is designated by reference numeral 50 in Figure 7. It will be appreciated that the seal 50 between the inner surface of the cover formation 32 and the outer surface of the detachable member 28 may be made in any suitable manner, for example by heat sealing or by suitable adhesives.

Of course, as will be understood by persons of ordinary skill in the art, the outlet assembly may be mounted to the carton at any suitable stage in the manufacture of the carton. For example, the carton may be made as a flat blank having a series of panels, fold lines, and the outlet hole 42 as known in the art. The carton may be formed, for example, of paperboard, which may be suitably coated or laminated. The coating or lamination protects the contents of the carton and the paperboard and may also provide a surface to which the outlet assembly may be adhered. The outlet formation 22 of the flanged member 20 may be inserted into the outlet hole 42 of the blank from a side of the blank that will be the inside surface of the carton, such that the outlet formation 22 projects through the outlet hole 42 in the carton. The flange 24 of the flanged member 20 may be sealed to the surface of the blank that will be the
inside surface of the carton. The cap member 30 may be mounted on the surface of the blank that will be the outside surface of the carton. The inner surface of the cover formation 32 may be sealed to the outer surface of the detachable member 28. Then, the blank may be folded into the carton shape, sealing edges of the blank to provide the carton to be filled, leaving an opening at the top. The carton may then be filled with the liquid to be contained and dispensed. Then edges of the carton at the top may be sealed to seal the container. These blank formation, folding and edge sealing steps will be well understood by persons of ordinary skill in the art.

[0037] Figure 8 shows the outlet assembly 10 of Figure 6 after hinging open the cap member 30. The cap member 30 may be hinged open by lifting the lifting flap 34 thereby causing it to pivot around hinge line 38. Because the inner surface of the cover formation 32 is sealed to the outer surface of the detachable member 28, lifting the cap member 30 pulls the detachable member 28 causing it to tear away from the remainder of the outlet formation 22. This opens an outlet hole 52 in the outlet formation 22, providing an opening through which to pour out the contents of the carton. It will be appreciated that, after dispensing some of the contents, the cap member 30 may be hinged closed by closing the lifting flap 34 around hinge line 38 such that the cover formation 32 is placed back over the outlet formation 22. The cover formation 32 and outlet formation 22 may be suitably designed to tightly close the outlet assembly 10. The detachable member 28 remains sealed to the inner surface of the cover formation 32.

[0038] The current invention avoids any issue of exposure of liquid to the cut edge of the carton around outlet hole 42. The sealing of the flange 24 of the flanged member 20 to the inside surface of the carton seals off the liquid from the raw edge of the paperboard. Thus,
the outlet assembly 10 provides an easy-opening, low cost outlet that avoids damage to the carton.

[0039] It will be appreciated that an outlet assembly according to the invention, due to its simple design, may be made by thermoforming. As compared to injection molded outlets such as those in the prior art having screw threads, a thermoformed outlet assembly according to the invention provides a substantial cost savings. The outlet formation, not needing screw threads, may also be made shorter than prior art outlets, and it may also be made thinner, both resulting in further cost savings. As just an example, and without limitation, the cap member and flange member of an embodiment may be made of high density polyethylene approximately 0.018 inch thick.

[0040] Figure 9 shows a cross-sectional view of another embodiment of an outlet assembly 60 according to the invention. In this embodiment, the detachable member 62 has a center portion that is raised from the reminder of the outlet formation. The lifting flap 64 has an extension 66 that projects slightly to facilitate lifting. Other aspects of the embodiment of Figure 9 are similar to the embodiment of Figure 6.

[0041] Figure 10 shows a cross-sectional view of another embodiment of an outlet assembly 70 the invention. In this embodiment, the entirety of detachable member 72 is raised from the reminder of the outlet formation. Also, the outlet assembly 70 is illustrated as being thinner relative to the carton as compared to the other illustrated embodiments. Other aspects of the embodiment of Figure 10 are similar to the embodiment of Figure 6.

[0042] It will be appreciated by persons of ordinary skill in the art that an outlet assembly according to the invention may be used with other suitable cartons besides gable top cartons. For example, the carton may just have a flat top. Similarly, it will be appreciated that
numerous variations may be made to the embodiments shown and described herein. Other variations will be readily envisioned based on the disclosure herein.
What is claimed is:

1. An outlet assembly for a carton comprising:
   a flanged member sealably attached to an interior side of the carton, the flanged member having an outlet formation that projects through an outlet hole in the carton; and
   a cap member mounted on an exterior side of the carton, the cap member having a cover formation that generally fits over the outlet formation of the flanged member;
   wherein the outlet formation on the flanged member has a fault line defining a detachable member;
   wherein an inner surface of the cover formation is sealed to the detachable member; and
   wherein lifting the cap member from the outlet formation tears away the detachable portion from the remainder of the outlet formation, thereby forming an outlet opening for the carton.

2. An outlet assembly as claimed in claim 1 wherein the flanged member comprises a flange surrounding the outlet formation, wherein the flange is sealed to the interior side of the carton.

3. An outlet assembly as claimed in claim 1 wherein the cap member has a lifting flap extending from the cover formation.

4. An outlet assembly as claimed in claim 3 wherein the lifting flap is substantially flat and is designed to lie substantially flat against the outer surface of the carton when the outlet assembly is closed.
5. An outlet assembly as claimed in claim 1 wherein the outlet assembly is adapted to be mounted on a gable top carton.

6. An outlet assembly as claimed in claim 1 wherein the outlet assembly is adapted to be mounted on a flat top carton.

7. An outlet assembly as claimed in claim 1 wherein the cap member is mounted to the carton in a hinged manner.

8. An outlet assembly as claimed in claim 1 wherein the cap member comprises a lifting flap, a tab member, and a hinge line between the lifting flap and the tab member.

9. An outlet assembly as claimed in claim 1 wherein the inner surface of the cover formation is sealed to the detachable member by heat sealing.

10. An outlet assembly as claimed in claim 1 wherein the inner surface of the cover formation is sealed to the detachable member by an adhesive.

11. A method of manufacturing a carton with an outlet assembly comprising:
    preparing a carton blank having a series of panels, fold lines, and an outlet hole;
    providing a flanged member having an outlet formation and a flange, wherein the outlet formation on the flanged member has a fault line defining a detachable member;
inserting the outlet formation of the flanged member into the outlet hole of the blank from a side of the blank that will be the inside surface of the carton, such that the outlet formation projects through the outlet hole in the carton;

sealing the flange of the flanged member to the side of the blank that will be the inside surface of the carton;

mounting a cap member to a side of the blank that will be the exterior side of the carton, the cap member having a cover formation that generally fits over the outlet formation of the flanged member;

sealing an inner surface of the cover formation to the detachable member;

folding the blank into the carton shape;

sealing edges of the blank to provide the carton to be filled, leaving an opening at the top;

filling the carton with liquid to be contained and dispensed; and

sealing edges of the carton at the top to seal the container;

wherein lifting the cap member from the outlet formation tears away the detachable portion from the remainder of the outlet formation, thereby forming an outlet opening for the carton.

12. A method as claimed in claim 11 wherein the cap member has a lifting flap extending from the cover formation.

13. A method as claimed in claim 12 wherein the lifting flap is substantially flat and is designed to lie substantially flat against the outer surface of the carton when the outlet assembly is closed.
14. A method as claimed in claim 11 wherein the outlet assembly is mounted on a gable top carton.

15. A method as claimed in claim 11 wherein the outlet assembly is mounted on a flat top carton.

16. A method as claimed in claim 11 wherein the cap member is mounted to the carton in a hinged manner.

17. A method as claimed in claim 11 wherein the cap member comprises a lifting flap, a tab member, and a hinge line between the lifting flap and the tab member.

18. A method as claimed in claim 11 wherein the inner surface of the cover formation is sealed to the detachable member by heat sealing.

19. A method as claimed in claim 11 wherein the inner surface of the cover formation is sealed to the detachable member by an adhesive.

20. A method as claimed in claim 11 wherein the carton blank comprises paperboard and the flanged member and cap member are plastic.
21. A method as claimed in claim 20 wherein the flanged member and cap member are made by thermoforming.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B65D 41/32 (2008.04)
USPC - 220/268

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(8) - B65D 41/32 (2008.04)
USPC - 220/268

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

USPC - 220/265, 266, 269, 276; 215/233, 306; 222/541.9 (text search - see terms below)

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
PUBWEST (USPTO, PGP, EPAB, JPAB); Google Scholar; Google Patents

Search Terms: container, seal, cap, carton, outlet, opening, flange, detachable, removable, flap, interior, attached, connect, secure, heat, sealing, adhesive, thermoforming

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>Y</td>
<td>US 6,745,923 B2 (Julian) 08 June 2004 (08.06.2004), col 1, in 14-18</td>
<td>1-21</td>
</tr>
<tr>
<td>Y</td>
<td>US 6,244,467 B1 (Lewitt) 12 June 2001 (12.06.2001), Fig 4</td>
<td>8 and 17</td>
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</tbody>
</table>

Further documents are listed in the continuation of Box C.

* 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 application or patent but published on or after the international filing date
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