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(54) **ZIP SEALED FLEXIBLE POUCH**

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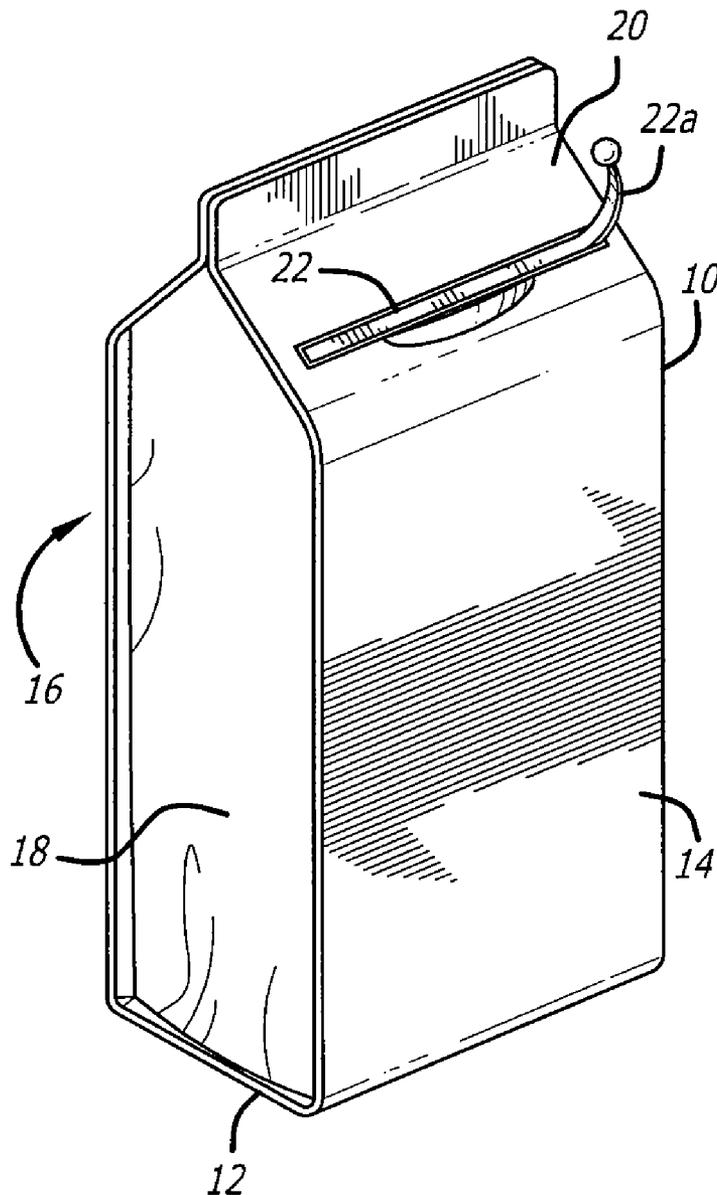
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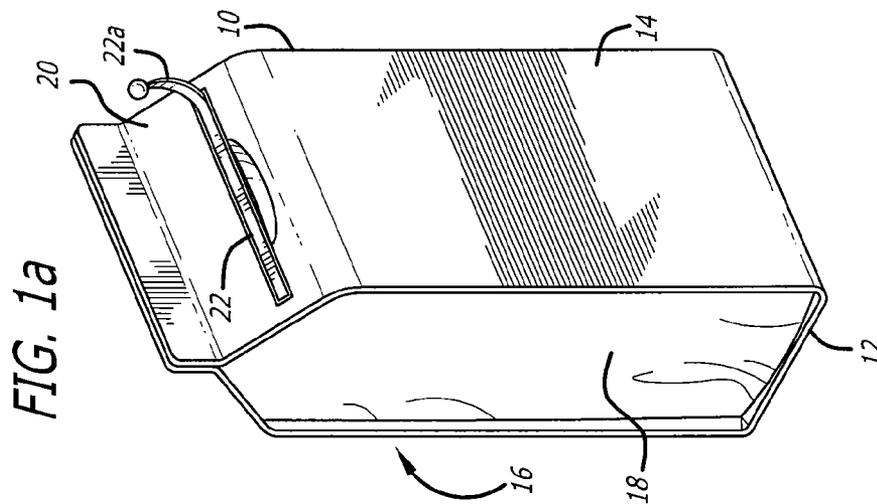
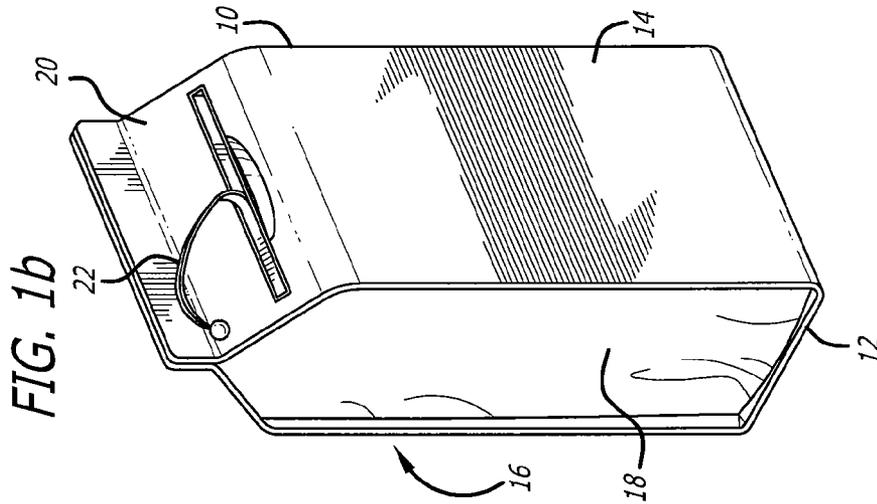
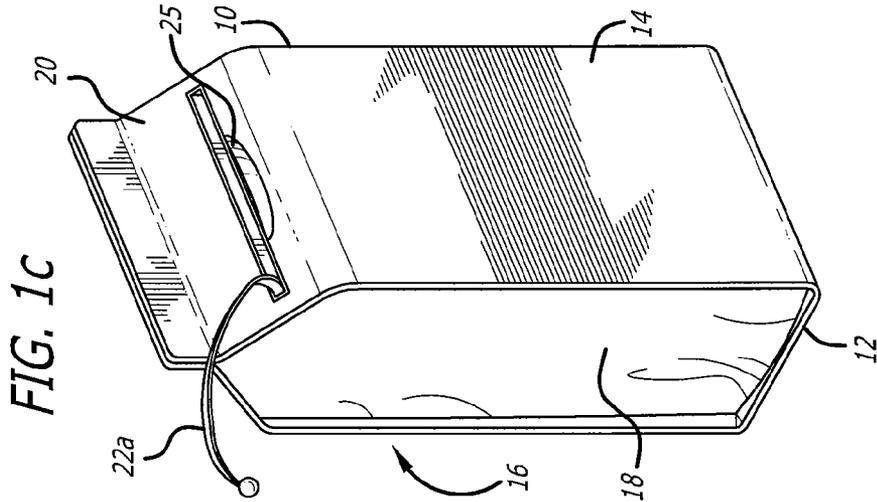
(57) **ABSTRACT**

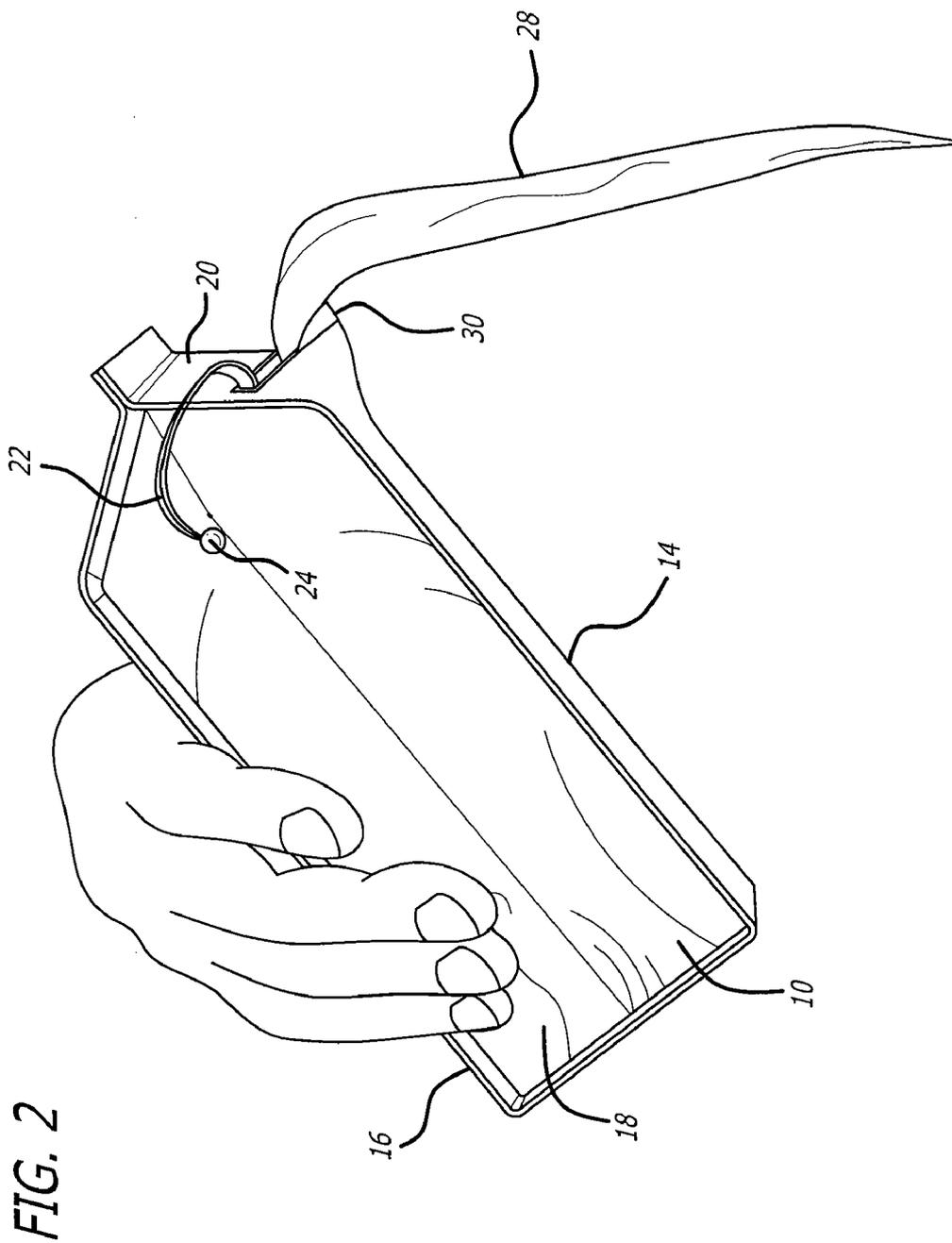
front wall, and further comprising a closure mechanism comprising a thin membrane patch bonded to said pouch about a periphery of said opening, a platform bonded to said thin membrane patch, said platform including a window formed therein and a plurality of cutting surfaces adjacent said window, and a pull strip bonded to said thin membrane patch and attached to said platform by a frangible membrane, wherein a removal of the pull strip ruptures said frangible membrane and tears said thin membrane patch at said cutting surfaces.

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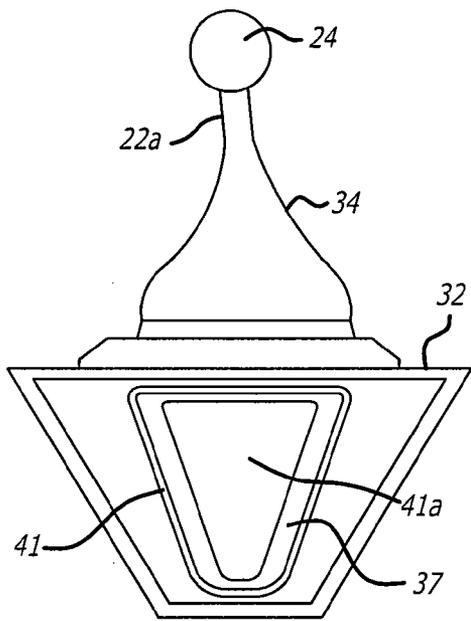


FIG. 3a

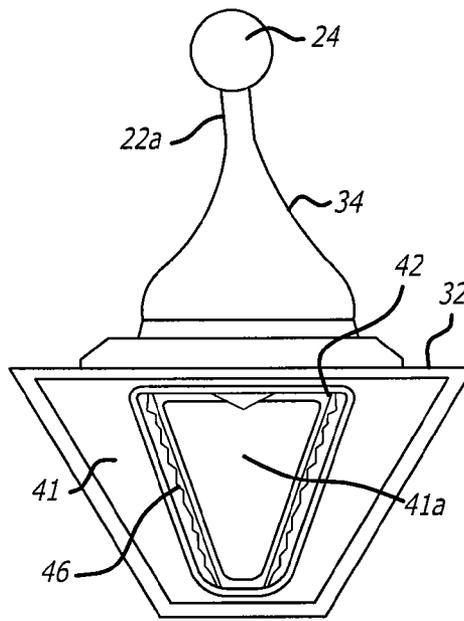


FIG. 3b

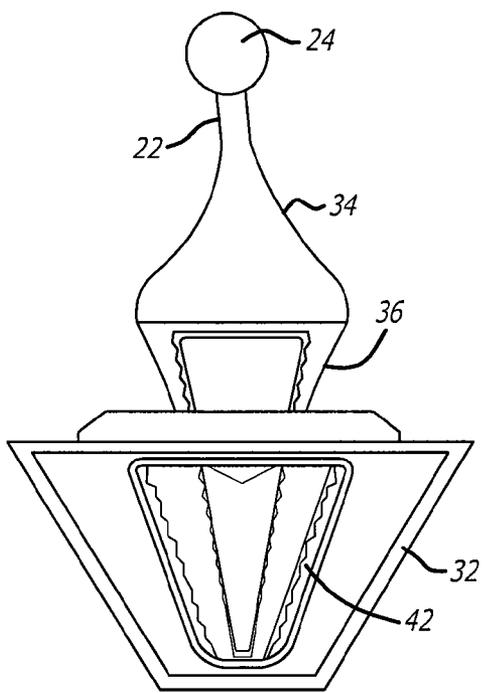


FIG. 3c

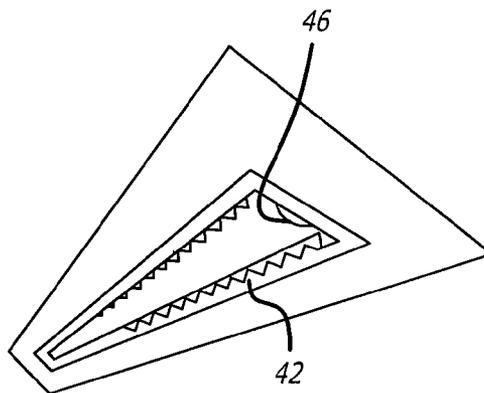
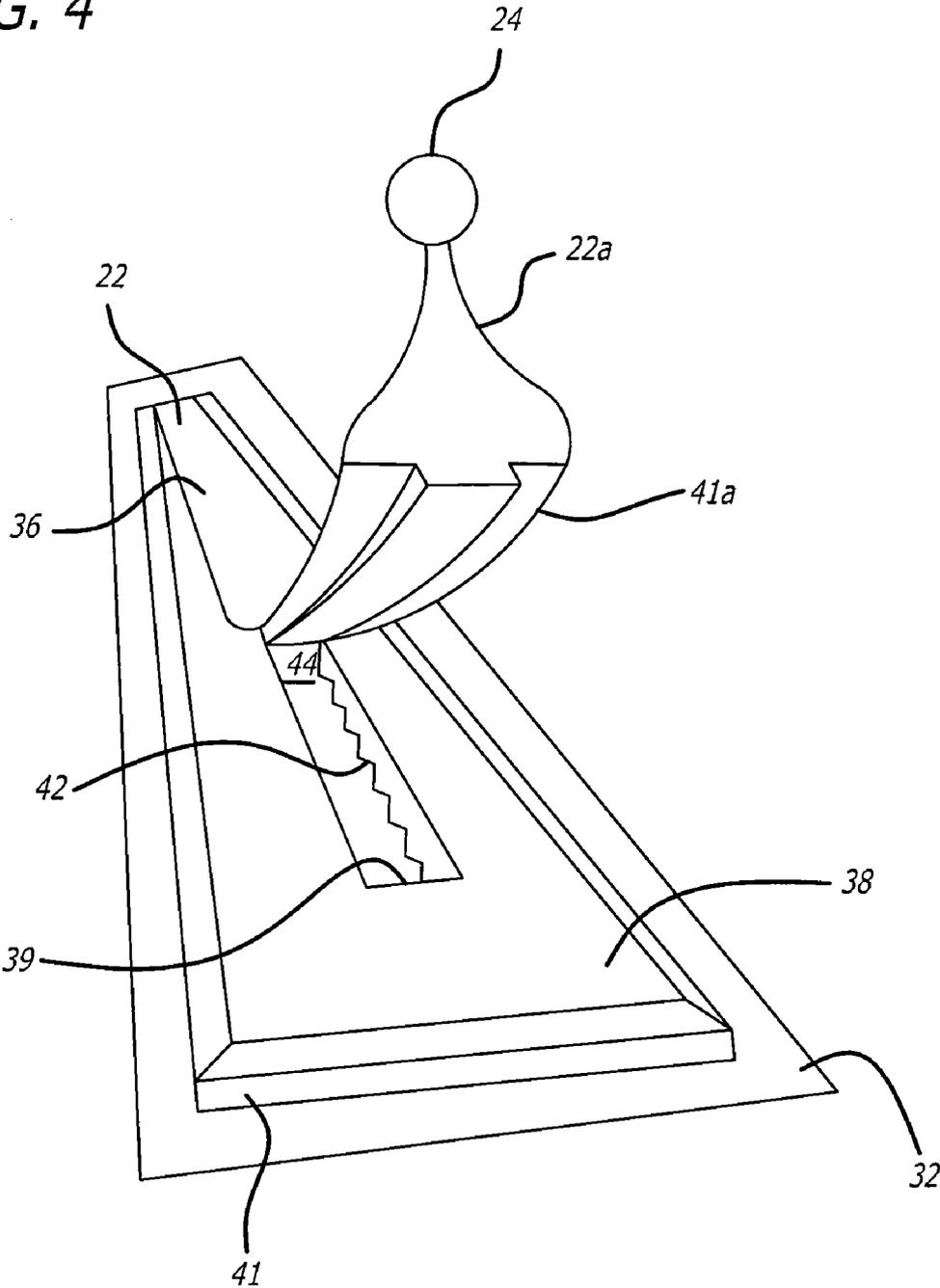


FIG. 3d

FIG. 4



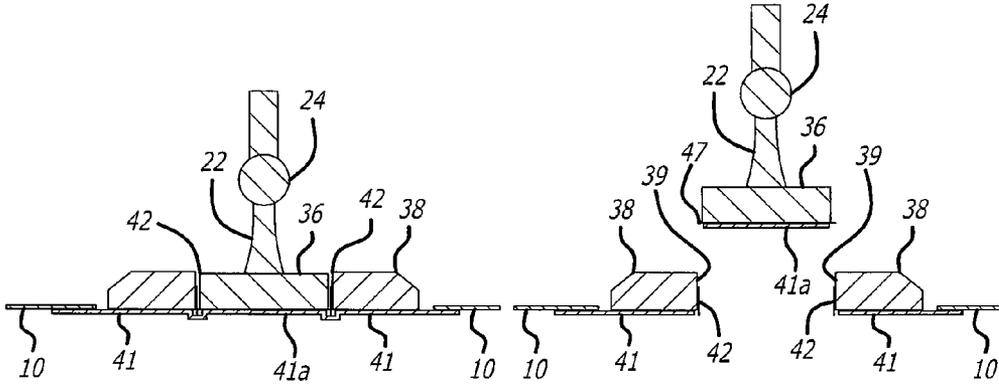


FIG. 5a

FIG. 5b

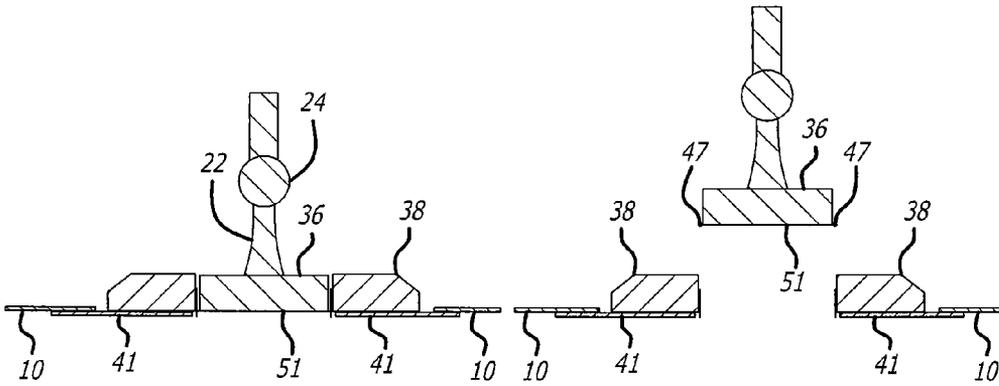


FIG. 6a

FIG. 6b

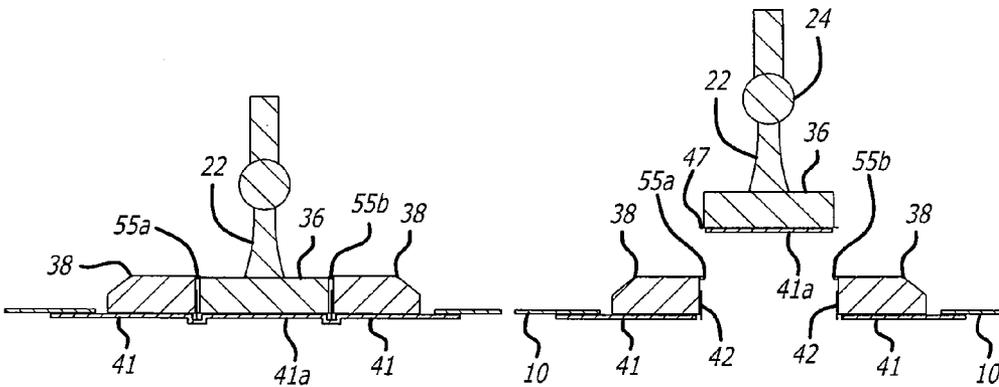


FIG. 7a

FIG. 7b

ZIP SEALED FLEXIBLE POUCH

BACKGROUND

[0001] The present invention relates generally to flexible containers for liquids and gels, and dry contents, and more particularly to a disposable flexible pouch with a removable strip that can be pulled to gain access to the contents of the pouch.

[0002] Flexible beverage containers are well known in the art, with many shapes and sizes. Common configurations include pouches with straw holes that can be punctured to permit access to the beverage contained therein. Other types of packages include those with spouts, including threaded spouts that employ a twist-off cap. U.S. patent application Ser. No. 11/471,930 filed Jun. 21, 2006 by the present inventor and assigned to the present assignee discloses a method for attaching a spout to a flexible container, and the contents of that application are incorporated fully herein by reference. Another method is a "cut and pour" type of emptying the contents of a stand-up pouch (a pouch with the gusset on the bottom of the pouch).

[0003] While twist-off spouts can be utilized effectively in certain conditions, detachable caps can be misplaced or lost. If a mode of access can be improved to make it easier to open the container, this improved mode will enjoy success in the market place. However, there are many difficulties that arise when working with thin films that form the body of flexible beverage pouches, and it is important to be cognizant of waste and spillage that can arise by poorly constructed opening mechanisms that cause premature puncture or are too difficult to open. There is a need in the art for a pouch with an opening mechanism that is both secure, sterile, and easy to implement in conjunction with thin film pouches. Many stand-up pouches (gusset on the bottom) use a simple method of opening with just a cut and pour feature, although the results of using this method can be messy and not re-closable. However, with a side gusseted pouch, one cannot easily cut the top of this pouch and pour, as cutting the top will jeopardize the structure of the pouch and may cause the contents to spill. The present invention provides a low cost solution for both pouch types, including other pouch shapes as well.

SUMMARY OF THE INVENTION

[0004] The present invention is characterized by a thin film pouch with a front wall, and rear wall, and an opening in said front wall, and further comprising a closure mechanism comprising a thin membrane patch bonded to said pouch about a periphery of said opening, a platform bonded to said thin membrane patch, said platform including a window formed therein and a plurality of cutting surfaces adjacent said window, and a pull strip bonded to said thin membrane patch and attached to said platform by a frangible membrane, wherein a removal of the pull strip ruptures said frangible membrane and tears said thin membrane patch at said cutting surfaces.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. 1a is an elevated perspective view of a first preferred embodiment of the present invention prior to release of the pull tab;

[0006] FIG. 1b is an elevated perspective view of a first preferred embodiment of the present invention with the pull tab partially released;

[0007] FIG. 1c is an elevated perspective view of a first preferred embodiment of the present invention with the pull tab fully released;

[0008] FIG. 2 is an elevated perspective view of the embodiment of FIG. 1 after release of the pull tab;

[0009] FIG. 3 is an enlarged, lower perspective view of the pull strip and platform of the present invention;

[0010] FIG. 4 is an enlarged, elevated perspective view of the pull strip being lifted off the platform;

[0011] FIG. 5a is an enlarged, cross-sectional view of the pull strip and platform prior to actuation of the pull tab;

[0012] FIG. 5b is an enlarged, cross-sectional view of the pull strip and platform after actuation of the pull tab;

[0013] FIG. 6a is an enlarged, cross-sectional view of a second embodiment of the pull strip and platform prior to actuation of the pull tab;

[0014] FIG. 6b is an enlarged, cross-sectional view of the embodiment of FIG. 6a after actuation of the pull tab;

[0015] FIG. 7a is an enlarged, cross-sectional view of a re-closable embodiment of FIG. 5 prior to actuation of the pull tab; and

[0016] FIG. 7b is an enlarged, cross-sectional view of the embodiment of FIG. 7a after actuation of the pull tab.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] FIGS. 1a-1c illustrate a flexible pouch having a pull strip as part of a zip release opening that can be actuated to tear an elongate strip of pouch away from the body of the pouch to gain access to the contents therein. The pouch 10 includes a body having a base 12, a front surface 14, a rear surface 16, side surfaces 18, and a top 20. The pouch may have a gable design as shown, or can take the form of a brick, triangular, or pillow-shaped pouch. The pouch 10 may be created by any of the many known techniques for formulating a closed container that incorporates a thin walled member. As further shown in FIG. 1, the pouch 10 of the present invention includes a pull strip 22 including a free end 22a that can be grasped between a thumb and forefinger to actuate the zip release opening 25. The free end 22a of the pull strip 22 preferably includes a grasping member can take many forms, such as a spherical anchor 24, annular ring, or flat tab with ridges that can be easily grasped. The pull strip 22 is pulled back to engage the thin wall 32 of the pouch's outer skin, and then retracted to tear open an elongate aperture 25 on the pouch 10 to expose the pouch's interior. When the pull strip 22 is fully retracted as shown in FIG. 1c, the contents 28 of the pouch 10 can be poured out or otherwise accessed in an expeditious manner as shown in FIG. 2. Note that the pouch 10 can be formed with a pouring ledge 30 or other spout structure to prevent fluid from dribbling down the front surface 14 of the pouch during pouring. The coupling of the pull strip 22 to the pouch will now be described in more detail.

[0018] FIGS. 3 and 4 illustrate the operation of the pull strip 22 from initial deployment to full release. As shown in FIG. 4, the pull strip 22 comprises an elongate plastic strip 36 that is affixed to a rectangular platform 38 with an elongate window 44 disposed therein and covered by the plastic strip 36. On the border 39 of the platform 38 that defines the window 44 are first and second rows of downwardly directed cutting teeth 42 along each longitudinal edge, and a larger cutting tooth 46 at an edge where the free end 22a is located. In FIG. 3a, the platform 38 is bonded to a thin membrane patch 41 that connects the platform 38 to the edge 32 of the pouch. The

plastic strip 36 is also bonded to the thin membrane patch 41a, where the bonding of the plastic strip 36 to the membrane patch 41a is surrounded by the cutting teeth 42, 46. In between the bonding of the patch 41a and the patch 41 at the perimeter of the platform 38 is a slightly raised surface 37 (FIG. 3a). The cutting teeth 42, 46 are fully concealed beneath the raised surface 37 of the membrane patch 41 prior to actuation of the pull strip 22. As the pull strip 22 is initially lifted as shown in FIG. 3b, the plastic strip 36 begins to separate from the platform 38, and the thin film membrane 41a attached to the plastic strip 36 is pulled upward against the cutting teeth 42. The cutting teeth 42 pierce the thin membrane 41, beginning with the tooth 46, as shown in FIG. 3b. As the plastic strip 36 is further pulled away from the platform 38 as shown in FIG. 3c, the portion of the membrane 41a that is bonded to the lower surface of the plastic strip 36 is retained by the plastic strip 36 as the cutting teeth 42 sever the surrounding membrane, creating an aperture 25 in the pouch through the window 44 of the platform 38. FIG. 3d shows the pouch opening with the plastic strip 36 separated from the platform 38 to fully expose the window 44 and create the pour spout for the pouch.

[0019] FIG. 5a shows a cross-sectional view of the closure prior to actuation of the pull strip 22. The plastic strip 36 carries the pull tab 24 at a proximal end, and rests between edges 39 of the platform 38. Cutting teeth 42 are disposed along the edges 39 and project below the lower surface of the platform 38. The patch 41, 41a are bonded to the bottom surface of the plastic strip 36 and the bottom surface of the platform on opposite sides of the cutting teeth 42. To enhance ultrasonic bonding of the platform 38 and the plastic strip 36 to the membrane 41, small raised tabs can preferably extend from those surfaces where said bonding occurs. The plastic strip 36 is attached to the cutting teeth 42, 46 by a thin frangible sheet 47 in a septic embodiment shown in FIG. 5. The thin sheet 47 is severed when the pull tab 22 is actuated, separating the plastic strip 36 from the cutting teeth 42 as shown in FIG. 5b. This embodiment is aseptic because the plastic strip never contacts the contents of the pouch, but rather the pouch is preserved in an aseptic condition until it is opened. In FIG. 6a, an alternative embodiment is illustrated (non-septic) where the thin membrane 41a is omitted. Here, the platform 38 is bonded to the membrane patch 41, which in turn is bonded to the outer edge of the pouch 10. The pull strip 22 is connected to the platform 38 by a thin sheet 47, but the bottom surface 51 of the plastic strip 36 is exposed to the interior of the pouch 10. As shown in FIG. 6b, when the pull strip 22 is actuated, the sheet 47 is severed and the window 44 of the platform 38 is thereby exposed. In this embodiment, the cutting teeth 42, 46 can be minimized or omitted. FIGS. 7a and 7b illustrate another embodiment of the closure that can be re-closed after opening. The platform 38 is formed with retaining ledges 55a,b that extend slightly over the outer edges of the plastic strip 36. After the pull tab 22 is actuated and the sheets 47 are ruptured, the contents of the pouch can be accessed. If it is desired to re-close the opening, the plastic strip 36 can be returned to the platform 38 and the retaining ledges 55a,b flex to allow the plastic strip to return to the platform 38 where it is held in place by the retaining ledges. Although the aseptic condition has been eradicated by the opening of the plastic strip 36, for short term usages a simple resealing of the pouch is all that is needed. A non-septic version (see FIG. 6) can also be made with a re-closable closure as just described.

[0020] The closure of the present invention can be made of any sturdy plastic such as polyethylene or polypropylene, as long as economic bonding techniques such as, for example, ultrasonic bonding, will work with the plastic. Because the closure is molded in the closed position, it can be made from a single cavity mold, which is atypical for this type of closure. Using a single cavity mold significantly reduces the costs of manufacturing the closure, making the present invention very economical compared with alternative closure means.

[0021] The foregoing descriptions are intended to be illustrative of various embodiments within the scope of the present invention, and are not intended to be limiting or exclusive. One of ordinary skill in the art would readily appreciate many alternatives and deviations from those embodiments described above, and the invention is intended to include all such alternatives and deviations. Accordingly, the scope of the invention should be construed according to the ordinary meaning of the terms set forth in the appended claims in view of the foregoing descriptions.

I claim:

1. A closure mechanism for a thin walled pouch comprising:
 - a thin membrane patch secured to said thin walled pouch;
 - a platform bonded to said thin membrane patch, said platform formed with a window and a plurality of downwardly directed cutting surfaces; and
 - an elongate removable strip overlaying said window and connected to said platform by a frangible member, said frangible member ruptured by removal of said elongate strip.
2. The closure mechanism of claim 1 wherein said elongate removable strip is bonded to said thin membrane patch, and removal of said elongate strip tears said thin membrane patch along said cutting surfaces.
3. The closure mechanism of claim 2 wherein said elongate removable strip has a pull tab.
4. The closure mechanism of claim 2 wherein said cutting surface comprise a plurality of downwardly directing teeth.
5. The closure mechanism of claim 2 wherein said platform includes first and second retaining ledges to retain said elongate removable strip against said platform after said frangible member is ruptured.
6. The closure mechanism of claim 1 where said platform is ultrasonically bonded to said thin membrane patch.
7. The closure mechanism of claim 1 wherein said closure mechanism is made of polyethylene.
8. The closure mechanism of claim 1 wherein said closure mechanism is made from a single cavity mold process.
9. A thin walled disposable pouch having a front wall, and rear wall, and an opening in said front wall, and further comprising a closure mechanism comprising:
 - a thin membrane patch bonded to said pouch about a periphery of said opening;
 - a platform bonded to said thin membrane patch, said platform including a window formed therein and a plurality of cutting surfaces adjacent said window;
 - a pull strip bonded to said thin membrane patch and attached to said platform by a frangible membrane;
 - wherein a removal of the pull strip ruptures said frangible membrane and tears said thin membrane patch at said cutting surfaces.

10. The pouch of claim **9** wherein said elongate removable strip has a pull tab.

11. The pouch of claim **9** wherein said cutting surface comprise a plurality of downwardly directing teeth.

12. The pouch of claim **9** wherein said platform includes first and second retaining ledges to retain said elongate removable strip against said platform after said frangible member is ruptured.

13. The pouch of claim **9** where said platform is ultrasonically bonded to said thin membrane patch.

14. The pouch of claim **9** wherein said closure mechanism is made of polyethylene.

15. The pouch of claim **1** wherein said closure mechanism is made from a single cavity mold process.

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