ABSTRACT

A blister pack (10) includes a blister segment (12) and a tool (T1, T2), both integrally formed with a tray (Y). The blister segment (12) has a blister bubble (14) at least partially surrounded by a blister flange (F). Substrate (16) serving as a gate (18) covers the opening of the blister bubble (14). The tool (T1, T2) is adapted for puncturing the substrate gate (16/18) to gain access to the interior of the blister bubble (14). A blister segment (12) is configured and has reinforcing features (40, 34) so that it may serve as the tool (T1, T2).
BLISTER PACK WITH INTEGRAL ACCESS TOOL

TECHNICAL FIELD

[0001] This invention relates generally to blister packs and, more specifically, to blister packs including a tool for accessing an interior of a blister.

BACKGROUND OF THE INVENTION

[0002] A blister pack is a type of package that protects one or more items or articles, by sealing the articles between a substantially planar substrate and a concave compartment structure. The concave compartment structure is typically referred to as a blister or a bubble. Blisters are typically formed of a plastic or foil type material and the substrate is frequently paper, foil, plastic, paperboard or a laminate of one or more of these materials. The encased article is typically accessed by pushing the article, from the bubble side of the blister pack, until the article breaks through the substrate. Frequently, the blister pack includes lines of demarcation that define each segment having an individual blister. Each line of demarcation may be a frangible line, such as a perforated line, that facilitates separation of a segment of a blister from the blister pack.

[0003] A problem with blisters is that it is often difficult to push the product encased in the blister through the blister substrate. This problem can exist because the substrate is made particularly durable to maintain the freshness and efficacy of the encased product, or to inhibit removal of the encased product in order to increase the child-resistance rating. Thus, a need exists for a means for facilitating removal of an encased item or article from a blister.

[0004] One solution has entailed using a tool, which is not packaged with the blister pack, to puncture or cut the substrate of a blister. However, a tool such as this is not always available in every environment. Further, the tool may have a cutting blade that is a hazard to users. Another solution is to include a cutting apparatus in, or as part of the package, that includes the blister pack. However, these cutting apparatuses are manufactured separately from the blister packs and the rest of the package, thereby adding to material and manufacturing costs.

[0005] Although prior attempts to solve the problem of removing an encased article from its protective seal are known, there remains a need for a convenient and cost effective means for safely and efficiently penetrating the substrate or protective seal of a blister.

SUMMARY OF THE INVENTION

[0006] The present invention overcomes the shortcomings of the prior art by providing a blister pack that includes at least one blister segment with substrate covering a blister bubble opening and at least one integral tool for penetrating the substrate of the blister segment.

[0007] According to one aspect of the invention the tool is at least partially formed from a flanged portion of the blister pack. The blister pack includes a tray and a substrate. The flanged portion of the blister pack includes a substantially planar portion of the tray to which the substrate is attached. Lines of demarcation, including frangible lines and perforated lines, define the tool in the blister pack and facilitate detachment of the tool from the blister pack.

[0008] According to another aspect of the invention, the tool comprises a reinforced region and a blade region for cutting and/or puncturing substrate material. The reinforced region reinforces the blade region such that the blade region can penetrate, puncture or cut the substrate of a blister without undue deformation that might limit the tool's effectiveness. In one facet of this aspect, the reinforced region is in the form of a raised member. In another facet of this aspect the raised member is offset from an edge of the tool. In an additional facet this aspect, the raised member is proximate a cutting edge of the tool.

[0009] According to still another aspect of the invention, the tool is at least partially formed from a flanged portion of the blister pack and reinforcement is provided by a folded-over tab structure. The reinforced region of the tool is formed by folding the tab structure of the flanged portion along a fold line.

[0010] According to an additional aspect of the invention, the tool includes a blister bubble that defines the reinforced region.

[0011] According to yet another aspect of the invention, a system is provided including a blister pack and a package. The blister pack includes at least one blister. A tool for penetrating the substrate of a blister of the blister pack is integral to the package.

[0012] According to further aspect of the invention, a method for accessing an article in a blister in a blister pack is provided. The blister pack includes at least one blister and at least one tool. The method includes detaching a tool from the blister pack and using the tool to penetrate the substrate of a blister.

[0013] Other systems, methods, features, and advantages of the present invention will be or become apparent to one with skill in the art upon examination of the following drawings and detailed description. All such additional systems, methods, features, and advantages are included within the scope of the present teaching and are protected by the accompanying claims.

[0014] The foregoing has broadly outlined some of the aspects and features of the present invention, which should be construed to be merely illustrative of various potential applications of the invention. Other beneficial results can be obtained by applying the disclosed information in a different manner or by combining various aspects of the disclosed embodiments. Accordingly, other aspects and a more comprehensive understanding of the invention may be obtained by referring to the detailed description of the exemplary embodiments taken in conjunction with the accompanying drawings, in addition to the scope of the invention defined by the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a perspective view of an exemplary embodiment of blister pack, according to the present invention.

[0016] FIG. 2 is a plan view showing the blister pack of FIG. 1, according to the present invention.

[0017] FIG. 3 is a perspective view showing the blister pack of FIG. 1, wherein an exemplary embodiment of a blister segment is being detached from the blister pack, according to the present invention.

[0018] FIG. 4 is an elevation view showing the blister pack of FIG. 1, with an exemplary embodiment of a detached blister segment poised for use as an exemplary embodiment.
of a tool to puncture substrate over an opening of a selected blister bubble, according to the present invention.

FIG. 5 is a elevation view similar to FIG. 4, showing the exemplary embodiment of the tool being used to puncture substrate over an opening of a selected blister bubble, according to the present invention.

FIG. 6 is a perspective view of the blister pack of FIG. 1 and tool in use as shown in FIG. 5, according to the present invention.

FIG. 7 is a perspective view that is essentially the same view as FIG. 6 but with a reinforcing tab corner folded in reverse of its position in FIG. 6 and disposed on the side of the blister segment opposite the blister bubble, according to the present invention.

FIGS. 8 and 9, are related perspective views showing two steps (pre-puncturing and puncturing, respectively) in the use of an exemplary embodiment of a detached tool to open a detached blister segment, according to the present invention.

FIG. 10 is a perspective view of an exemplary embodiment of a tool disposed beside an opened blister segment, according to the present invention.

FIG. 11 is a perspective view of an exemplary embodiment of a tool using a blade portion that is proximate a reinforcing raised member to puncture substrate over a blister bubble opening of a blister segment, according to the present invention.

DETAILED DESCRIPTION

As required, detailed embodiments of the present invention are disclosed herein. It must be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms, and combinations thereof. As used herein, the word “exemplary” is used expansively to refer to embodiments that serve as an illustration, specimen, model, or pattern. The figures are not necessarily to scale and some features may be exaggerated or minimized to show details of particular components. In other instances, well-known components, systems, materials, or methods have not been described in detail in order to avoid obscuring the present invention. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention.

Referring now to the drawings, wherein like numerals indicate like elements throughout the several views, the drawings illustrate certain of the various aspects of exemplary embodiments of a blister pack that includes at least one blister and at least one tool for penetrating the substrate of a selected blister. The tool includes a strengthening element that provides structural rigidity to the tool in general and to a penetrating corner of the tool in particular.

To help distinguish the various elements of the invention, the term “blister bubble” will be used to refer to the cavity, blister, bubble or compartment to which access is sought through use of the tool. The term “blister segment” will be used to refer to the segment of the blister pack tray that may be separated from the tray itself. The blister segment comprises a blister bubble at least partially surrounded by a flange and having substrate covering the opening to the interior of the blister bubble.

Referring first to FIGS. 1 and 2, an exemplary blister pack 10 is illustrated that includes multiple individual blister segments 12 (best shown in FIG. 3). The blister pack 10 includes a tray Y that can be formed from a plastic type sheet to include cavities or bubbles 14. The tray Y of the exemplary embodiment is a substantially planar structure having blister bubbles 14. The size and shape of the bubbles 14 are design choices that are made such that one or more of an article can be disposed within a blister bubble 14. The blister pack 10 also includes a planar substrate 16 (shown in FIG. 7) that is formed from one or more layers of material. The substrate 16 may be paper, foil, plastic, paperboard or a laminate of one or more of these materials. The substrate 16 is attached to a substantially planar portion of the tray Y to cover the openings of the blister bubbles 14 and thereby enclose or seal articles within the blister bubbles 14.

The planar portion of the tray Y and the corresponding attached portion of the substrate 16 define a flanged portion F of the blister pack 10, and of each blister segment 12. Each portion of the substrate 16 that is disposed over the open end of a blister bubble 14 defines a gate 18 (shown in FIG. 7). Each blister segment 12 is defined in the blister pack 10 by lines of demarcation 20.

Referring to FIGS. 1, 2 and 3 simultaneously, the lines of demarcation 20 facilitate detachment of a blister segment 12 from the blister pack 10. For example, the lines of demarcation 20 may be frangible lines or perforated lines. In general, the lines of demarcation 20 may be typical weakened lines of severance.

Referring now to FIG. 3, in an exemplary embodiment, the flanged portion F of each blister segment 12 includes a penetrating corner 32 and a folding corner 34. The folding corner 34 is a tab at a corner of the blister segment 12 that is defined in part by a fold line 30. The penetrating corner 32 and the folding corner 34 are defined in part by a common first edge E1 and are further defined by an opposite edge E2, E3, respectively.

An end of the fold line 30 that is adjacent to the penetrating corner 32, or is otherwise adjacent to the first edge E1, is offset from the edge E2 by a distance L1. Opposite ends of the fold line 30 are offset a distance L2, L3 from the edges E3, E1, respectively. In the exemplary embodiment, the distances L1, L2, L3 are substantially the same.

Referring to FIGS. 5 and 6, the folding corner 34 of the blister segment 12 is folded along fold line 30 and toward the blister bubble 14. Alternatively, the folding corner 34 may be folded away from the blister bubble 14, as shown in FIGS. 7-10. The folded corner 34 and the flanged portion F, which the folding corner 34 substantially overlaps, define a reinforced region R1. A blade region B1 of the flanged portion F is defined between the reinforced region R1 and the edges E1, E2. The blade region B1 includes the penetrating corner 32.

The reinforced region R1 increases the structural rigidity of the adjacent blade region B1, including the penetrating corner 32, such that the blade region B1 can withstand an increased applied force before substantially bending, buckling or otherwise deforming. Accordingly, the exemplary blister segment 12 can be used as a tool T1 for penetrating the gate 18 of a selected blister segment 12. The selected blister segment 12 to be opened may be attached to the blister pack 10, as shown in FIGS. 4-7, or may be detached from the blister pack 10, as shown in FIGS. 8 and 9.

To access articles that are sealed in a selected blister segment 12, the penetrating corner 32 of the tool T1 is forced through the gate 18 of the selected blister segment 12, as shown in FIG. 5, thereby penetrating, or puncturing, the
selected blister segment 12. The edges E1, E2 of the tool T1 can be used to make and enlarge a cut C, as shown in FIG. 7, in order to facilitate access to the article. To access the encased article, the cut C may be made to facilitate tearing of the gate 18 as the article is pushed through it, to facilitate tearing gate 18 with a finger, or to create an opening that is large enough to allow a user to remove the article.

Referring again to FIGS. 1-4, in an exemplary embodiment, each blister segment 12 (shown in FIG. 3) includes a reinforcing bubble 40 that is disposed in a penetrating corner 42 of the flanged portion F. In this embodiment, reinforcing bubbles 40 are formed in the tray Y along with bubbles 14. Each reinforcing bubble 40 can be any suitable size or shape such that it increases the effective thickness of the flanged portion F to provide a reinforced region.

The reinforcing bubble 40 may be disposed such that it is offset from the edges E2, E4. A blade region B2 (shown in FIG. 3) of the flanged portion F is defined between the reinforcing bubble 40 and edges E2, E4. The reinforcing bubble 40 increases the structural rigidity of the blade region B2, including the penetrating corner 42, such that the blister segment 12 can be used as a tool T2 for penetrating the gate 18 of a selected blister segment 12.

Referring to FIG. 11, the penetrating corner 42 of the tool T2 is forced through the gate 18 of a selected blister segment 12 thereby penetrating the selected blister segment 12. Once the tool T2 has punctured the blister to form a cut C, the tool T2 can be used to propagate the cut C to facilitate access to the article.

It should be noted that the reinforcing or structural element that provides the reinforced region is not limited to a reinforcing bubble 40 formed from the tray Y. Rather, the structural element may be a protuberance in the form of a rib, a raised element, or an element that is attached to the tray Y or substrate 16 to provide the same functionality.

It should also be noted that the tools T1, T2 do not have to be integral to a blister segment 12, as described above. For example, the tool can be a flanged portion F of the blister pack 10, defined by lines of demarcation 20, or attached by a perforated edge.

In additional alternative embodiments, the blister pack 10 is packaged in a carton (not shown). The carton includes a flap with a reinforcing or structural element, such as a fold line, such that the flap can be used as a tool for accessing a selected blister segment 12.

The law does not require and it is economically prohibitive to illustrate and teach every possible embodiment of the present claims. Hence, the above-described embodiments are merely exemplary illustrations of implementations set forth for a clear understanding of the principles of the invention. Variations, modifications, and combinations may be made to the above-described embodiments without departing from the scope of the claims. All such variations, modifications, and combinations are included herein by the scope of this disclosure and the following claims.

What is claimed is:

1. A blister pack (10) comprising:
   a tray (Y) comprising
   at least one blister segment (12, 12') integrally formed with said tray (Y), said blister segment (12, 12') comprising a blister bubble (14) having an opening, and at least one tool (T1, T2) integrally formed with said tray (Y); and
   a substrate (18) substantially covering said opening of said blister bubble (14);
   wherein said at least one tool (T1, T2) is adapted for puncturing said substrate (18) to gain access to an interior of said bubble blister (14).

2. The blister pack of claim 1, wherein said at least one tool (T1, T2) is adapted for separation from said tray (Y).

3. The blister pack of claim 2, wherein said at least one tool (T1, T2) is adapted for separation from said tray (Y) by means of weakened lines of demarcation (20) that define a tool perimeter.

4. The blister pack of claim 1, wherein said at least one tool (T1, T2) comprises a tool flange (F) having at least two perimeter edges (E2/E4, E1/E2) that intersect to form a puncturing member (32, 42) for puncturing said substrate (18).

5. The blister pack of claim 4, wherein said tool flange (F) is adapted for withstanding deformation when a force is applied thereto.

6. The blister pack of claim 5, wherein said tool flange (F) is adapted for withstanding deformation by said tool flange further comprising a reinforcement member (34, 40).

7. The blister pack of claim 6, wherein said reinforcement member comprises a protuberance (40) extending outwardly from a plane of a tool flange (F).

8. The blister pack of claim 6, wherein said reinforcement member (34, 40) is disposed proximate said puncturing member (32, 42).

9. The blister pack of claim 6, wherein said reinforcement member (34, 40) comprises a tab (34) foldably adjoined to said tool flange (F).

10. The blister pack of claim 9, wherein said tab (34) is adapted for being folded out of a plane of said tool flange (F).

11. The blister pack of claim 1, wherein said at least one tool (T1, T2) comprises at least one of said at least one blister segment (12) adapted for withstanding deformation when a force is applied thereto.

12. The blister pack of claim 11, wherein said at least one blister segment (12) adapted for withstanding deformation comprises a blister flange (F) extending from at least a portion of a perimeter of said opening of said blister bubble (14), said blister flange (F) having at least two perimeter edges (E2/E4, E1/E2) that intersect to form a puncturing member (32, 42) for puncturing said substrate (18) and wherein said blister flange (F) is adapted for withstanding deformation when a force is applied thereto.

13. The blister pack of claim 12, wherein said blister flange (F) is adapted for withstanding deformation by said blister flange (F) further comprising a reinforcement member (34, 40).

14. The blister pack of claim 13, wherein said reinforcement member comprises a protuberance (40) extending outwardly from a plane of said blister flange (F).

15. The blister pack of claim 13, wherein said reinforcement member (34, 40) is disposed proximate said puncturing member (32, 42).

16. The blister pack of claim 17, wherein said reinforcement member (34, 40) comprises a tab (34) foldably adjoined to said blister flange (F).

17. The blister pack of claim 16, wherein said tab (34) is adapted for being folded out of a plane of said blister flange (F).

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