

PERFORATED SHRINK WRAP SLEEVES AND CONTAINERS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Appl. No. 61/374,027, filed August 16, 2010, and which is hereby incorporated by reference in its entirety.

FIELD

[0002] The present products and methods relate to packaging, and in particular to easy open containers having a perforated shrink wrap sleeve.

BACKGROUND

[0003] Sealing product containers, labeling container contents and providing evidence that a container has not been opened are known using heat-shrinkable films ('shrink wrap'). Applying such films are described in U.S. Patent No. 6,296,129 to Kawasaki and U.S. Patent No. 5,605,230 to Marino et al., the specifications of which are incorporated by reference. Shrink wrap applications can be economically applied to a variety of containers for a variety of products, such as food or pharmaceutical applications.

[0004] Despite the advantages of heat shrink films, shrink wrap packaging can sometimes be difficult for irregularly shaped containers. In such cases, shrink wrap can be difficult to apply, difficult to remove, and difficult to provide printed matter without noticeable distortion.

SUMMARY

[0005] Accordingly, provided herein are embodiments for perforated shrink wrap sleeves and containers with perforated shrink wrapped sleeves configured to provide easy partial removal, evidence of tamper, and product labeling - even with irregularly shaped and non-symmetrical containers.

[0006] A preferred embodiment provides a container having a container body that can have a circumference/perimeter variation along a vertical axis, a bottom surface, and a container opening having a top surface; an axially oriented shrink wrap sleeve covering a portion of the body of the container having a circumference variation and the container opening, a top edge of the shrink wrap sleeve allowing the top surface to remain exposed, and bottom edge of the shrink wrap sleeve allowing the bottom surface to remain exposed; the shrink wrap sleeve having a pair of generally vertical perforations descending from the shrink wrap top edge towards a circumferential perforation ring oriented below the container opening. In some embodiments, the axially oriented shrink wrap sleeve covering a portion of the container body circumference variation has a greater circumference as compared to adjacent portions of the circumference variation at at least one point between the shrink wrap top (or alternately shrink wrap circumferential perforation ring) and bottom edges.

[0007] In other embodiments the axially oriented shrink wrap sleeve covering a portion of the container body circumference variation can have a smaller circumference as compared to adjacent portions of the circumference variation at at least one point between the shrink wrap horizontal perforations and bottom edges. Circumference

variation can be in the range of about 5 percent to about 200 percent, and preferably about 100 percent.

[0008] Generally vertical perforations descending from the shrink wrap top edge can converge progressively closer together as they approach the circumferential ring. The vertical perforations descending from the shrink wrap top edge can terminate at the circumferential ring or alternately about two perforations above the circumferential ring. Such a distance corresponds to the length between two perforations or more of the generally vertical perforations.

[0009] In other embodiments, the shrink wrap vertical perforations descending from the shrink wrap top edge can begin with an initial perforation cut, followed by proportionally smaller perforation cuts, configured so that when the shrink wrap is applied to the container body, the larger cut forms as 'V' shape at a top of each vertical perforation to define a tab between the vertical perforations.

[0010] The container body can generally have a planar front and rear surface, and a seal of the shrink wrap is vertically oriented along an edge of the rear surface.

[0011] In a specific embodiment, the container can have a container body having a vertical axis, a bottom surface, and a container opening having a top surface; a vertically oriented shrink wrap sleeve covering a portion of the container body and the container opening, a top edge of the shrink wrap sleeve allowing the top surface to remain exposed, and bottom edge of the shrink wrap sleeve allowing the bottom surface to remain exposed; the shrink wrap sleeve having a pair of generally vertical perforations descending from the shrink wrap sleeve top edge towards a circumferential perforation ring oriented below the container opening.

[0012] In another specific embodiment, the container can have a container body having a circumference variation along a vertical axis, a bottom surface, and a container opening having a top surface; a vertically oriented shrink wrap sleeve covering a portion of the circumference variation of the container body and the container opening, a top edge of the shrink wrap sleeve allowing the top surface to remain exposed, and bottom edge of the shrink wrap sleeve allowing the bottom surface remain exposed; the shrink wrap sleeve having a pair of generally vertical perforations descending from a distance below the shrink wrap sleeve top edge towards a circumferential perforation ring oriented below the container opening.

[0013] Embodiments of a shrink wrap sleeve suitable for use for covering a portion of a container along a vertical axis having a circumference variation can have a top edge and bottom edge; the shrink wrap sleeve having a pair of generally vertical perforations descending from the shrink wrap sleeve top edge towards a circumferential perforation ring. Optional features of the present embodiments can include printed indicia and adhesive to bond the container to the shrink wrap sleeve. The shrink wrap sleeve of claim 14 can be a polyolefin, a polymer such as polyethylene terephthalate (PET), a copolymerized polyethylene terephthalate (PETG), polyethylene terephthalate glycol (PETG LV), polyvinyl chloride (PVC), polypropylene (PP), polyethylene (PE), and combinations thereof. Preferably the shrink wrap sleeve is a PETG, and even a PETG LV. The shrink wrap film can have a gauge of between about 40 to 55 microns, and preferably about 45 microns. The shrink wrap sleeve can have a shrinkage rate of about 75 percent to about 85 percent, and a shrinkage ratio of about 2:1.

[0014] Other features will become more apparent to persons having ordinary skill in the art to which the package pertains and from the following description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The foregoing features, as well as other features, will become apparent with reference to the description and Figures below, in which like numerals represent like elements, and in which:

[0016] FIG. 1 is a front perspective view of one embodiment of an exemplary container having a perforated shrink wrap sleeve;

[0017] FIG. 2 is a front perspective view of one embodiment of an exemplary container having a perforated shrink wrap sleeve with a first perforation peeled away;

[0018] FIG. 3 is a front perspective view of one embodiment of an exemplary container having a perforated shrink wrap sleeve with a first perforation removed and a second perforation peeled partially away;

[0019] FIG. 4 is a front perspective view of one embodiment of an exemplary container having a perforated shrink wrap sleeve with a first and second perforation peeled away;

[0020] FIG. 5 is a rear perspective view of one embodiment of an exemplary container having a perforated shrink wrap sleeve;

[0021] FIG. 6 illustrates one embodiment of an exemplary perforated shrink wrap sleeve in a front planar view (6a) and as a side view placed on a container (6b);

[0022] FIG. 7 illustrates a second embodiment of an exemplary perforated shrink wrap sleeve in a front planar view (7a) and as a side view placed on a container (7b);

[0023] FIG. 8 illustrates a third embodiment of an exemplary perforated shrink wrap sleeve in a front planar view (8a) and as a side view placed on a container (8b);

[0024] FIG. 9 illustrates a fourth embodiment of an exemplary perforated shrink wrap sleeve in a front planar view (9a) and as a side view placed on a container (9b);

[0025] FIG. 10 illustrates a fifth embodiment of an exemplary perforated shrink wrap sleeve in a front planar view (10a) and as a side view placed on a container (10b);

[0026] FIG. 11 illustrates one embodiment of an exemplary perforated shrink wrap sleeve in a rear planar view;

[0027] FIG. 12 illustrates a blank of one embodiment of a shrink wrap sleeve for a container; and

[0028] FIG. 13 is a front planar view of second embodiment of an exemplary container having a perforated shrink wrap sleeve.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0029] Provided herein are embodiments for perforated shrink wrap sleeves and containers with perforated shrink wrapped sleeves configured to provide easy partial removal, evidence of tamper, and product labeling - even with irregularly shaped and non-symmetrical containers.

[0030] Generally, the present embodiments illustrate a cost efficient and easy open feature for consumers to obtain full product access. As described, the present embodiments can provide printed surfaces to provide graphics and other types of printed information on a shrink wrapable film that can be transparent, translucent, opaque, or variations/combinations thereof. Metallic inks can also be provided to

provide a silver or metallic hue. To accommodate container shape irregularities, a maximum to minimum shrinkage ratio should be at least 2:1. It is noted that various product container sizes are possible so long as the shrink wrap can be maintained thereon even after a partial band of film has been removed. Preferably, the shrink wrap film is applied as a sleeve. When a container bottom is present, it is preferably not encapsulated by the shrink wrap. On top tapered containers, the sleeve should terminate at a height on the container so that no 'puckering' would occur. For example, for the container embodiments illustrated in FIGs. 1 and 13, a sleeve is shown that is proportioned to reduce any evidence of a 'pucker' near the top and is not present on the bottom to allow the container to stand on its own.

[0031] The perforations of the present embodiments can permit removal of shrink wrap above the shoulder area, which allows access to a container opening, such as a flip top cap. The shrink wrap perforations provide a tamper evident feature in that once the perforations have been breached (ruptured) and/or a partial band of film material has been removed, it is visually obvious that the container has been opened. There are several perforation patterns described within the present embodiments, though it is noted that several other variations are possible. Nevertheless, the general features of the perforation patterns can provide two separate perforation types. A first pattern can be a pair of perforations axially oriented to the sleeve to form a tab; and a second pattern can be a generally circumferential ring pattern perpendicular to the axially oriented perforations to define an upper band for removal. The axial pair of perforations can terminate at or near (e.g., 1-5 mm or 1-3 perforations) above the circumferential ring. The patterns can be configured to remove the upper band of material in one

motion or by removing first a vertical tab, and then the remaining portion of the upper band. The material for the shrink wrap should be configured to withstand multiple container flexing (e.g., at least 50 times). This feature is useful for a container that contains products, such as a beverage concentrate, that require the container to be squeezed to deliver product.

[0032] Turning now to the Figures, a container having a perforated shrink wrap sleeve is generally indicated at 10. As shown, the container 10 can be used to dispense a liquid concentrate in a desirable manner. The container 10 can include desirable properties, for example, to consistently discharge across a range of squeezed forces, generally consistent discharge with the same force without significant dependence on the amount of liquid concentrate in the container, a substantially dripless or leak proof outlet opening, a jet that minimizes splashing when the liquid concentrate enters another liquid, and a jet that maximizes mixing between the liquid concentrate and the other liquid. The container 10 utilizes some or all of these properties while dispensing a jet of the liquid concentrate into a target container having a target liquid therein. The container 10 described herein can dispense a liquid concentrate in such a way as to enter the target liquid without substantial splashing or splatter while also causing sufficient turbulence or mixing within the target container between the liquid concentrate and the target liquid to form a generally homogenous end mixture without the use of extraneous utensils or shaking.

[0033] Referring now to FIGs. 1 and 13, exemplary forms of the container 10 are shown with at least some, and preferably all, of the above properties. The container can include a closed, first end 12 and a top, second end 14 having a hinged flip top cap

16 secured to a back surface 23 by a hinge 44. The first end 12 and the flip top cap 16 can be connected by a generally tubular sidewall 18, which can take any suitable cross section, including any polygonal shape, any curvilinear shape, or any combination thereof, to form a container interior. Preferably, the container 10 can be sized for any number of uses and can specifically be in the range of 20 to 200 cc.

[0034] Exemplary shapes of the container 10 are illustrated in FIGs. 1 and 13 in which the first end 12 acts as a secure base for the container 10 to rest upon. The sidewall 18 can generally extend upward from the base or first end 12 to the second end 14. In the form of FIG. 1, the container 10 can have a generally 'egg' shape, where front and rear surfaces 21 and 23 respectively are curved to provide an ergonomic container shape. In another example in FIG. 13, the sidewalls 18 can include a 'waist' 80 so that the container 10 has an 'hourglass' shape on its front planar view.

[0035] Partially covering the container 10, including a seam for the flip top cap 16 can be a perforated shrink wrap sleeve 30 having two perforation patterns including generally a pair of vertical perforations 32 extending downward toward a horizontal (circumferential) perforation ring 34. The shrink wrap sleeve 30 can be a polyolefin such as polyethylene terephthalate (PET), a copolymerized polyethylene terephthalate (PETG), polyethylene terephthalate glycol (PETG LV – such as sold as a film by GILBRETH, Croydon, PA, USA), polyvinyl chloride (PVC), polypropylene (PP), polyethylene (PE), and combinations thereof (or other shrinkable films). Preferably, the shrink wrap sleeve 30 is PETG. The gauge of the shrink wrap sleeve 30 can be about 40 to 55 microns, preferably about 45 microns. Shrinkage of the shrink wrap sleeve 30 can be at a shrinkage rate of about 75 percent to about 85 percent (preferably about 76

percent) and have a shrink ratio selected to preferably withstand a shrinkage ratio of about 2:1. The shrink wrap sleeve 30 can provide printed surfaces for graphics and other types of printed information or indicia on film that can be transparent, translucent, opaque, or various combinations thereof. Metallic inks can also be provided to provide a silver or metallic hue.

[0036] In the present embodiments, the container 10 preferably has a body having a circumference variation along an axis oriented to receive the shrink wrap sleeve 30, such as a vertical axis. It is noted that circumference by the present term can mean a perimeter variation and can include circles, ellipses and other various curvilinear or geometric shaped cross-sections. By way of illustration, container 10 is configured to receive a shrink wrap sleeve 30 along a vertical axis. The portion of the container body covered by shrink wrap sleeve 30 can have a circumference variation having a greater (FIG. 1, 18) or lesser (FIG. 13, 80) circumference at at least one point between the shrink wrap horizontal perforation ring 34 and a shrink wrap bottom edge 20 as compared to adjacent portions of the circumference. Alternately, the portion of the container body covered by the shrink wrap sleeve 30 can have a circumference variation having a greater (FIG. 1, 18) or lesser (FIG. 13, 80) circumference at at least one point between the shrink wrap top edge 22 and the shrink wrap bottom edge 20 as compared to adjacent portions of the circumference. This variation can preferably range from about 5 percent to about 200 percent, and most preferably at about 100 percent. Printing on a blank 28 (FIG. 12) for the shrink wrap sleeve 30 can have its printing distorted to accommodate circumference variation once the shrink wrap film has been applied to the container. For example, for the container 10 of FIG. 1 having a film

height of about 80 mm and placed as shown in FIG. 1, distortion rates can be based on the following distortion percentage TABLE as follows:

TABLE:

<u>Percent distortion</u>	<u>Vertical bottle height position (mm)</u>
135	62-80
117	50-62
110	15-50
120	0-15

[0037] The axial circumference variation can prevent the shrink wrap seal from slipping off the container before and/or after an upper band of shrink wrap is removed to expose a container opening, such as the illustrated flip top cap 16 and allow it to be opened for product removal. Alternately, an adhesive can be applied between the container 10 body and an inner surface of the shrink wrap sleeve 30 in various configurations.

[0038] The perforation patterns for the present embodiments can be varied but preferentially include a generally circumferential ring of perforations generally perpendicular to the vertical perforations 32. Horizontal perforations 34 for a vertically oriented shrink wrap sleeve 30, as illustrated, generally define an upper edge of the shrink wrap sleeve 30 remaining after the upper band 38 is removed to expose the container opening for product removal.

[0039] A second aspect of the shrink wrap sleeve 30 perforations is a pair of perforations that can run generally perpendicular to the circumferential ring of perforations. As illustrated for a vertically oriented shrink wrap sleeve, generally vertical

perforations 32 can descend from the shrink wrap top edge 22 towards the horizontal ring perforation ring 34, which is oriented below access to the flip top cap 16. Access to flip top cap 16 can be by way of a recession portion 52 under a ledge 54. Again, many perforation pattern variations are possible within the scope of the embodiments. FIGs. 6 – 10 illustrate just a sample of these types of variations. The vertical perforations 32 can be parallel, converge, or expand as they extend (here, descend) towards the circumferential perforation ring 34. The vertical perforations 32 can terminate at the horizontal ring 34 or terminate at some point above the horizontal ring 34.

[0040] As illustrated, the vertical perforations preferably converge as they approach the horizontal ring 34. FIG. 6a shows a perforation pattern for a shrink wrap sleeve ready for placement and heat shrinking onto the container body 10. FIG. 6b illustrates the shrink wrap sleeve 30 after it has been applied to the container 10 and affixed to the container by heat shrinking or other means known in the art to shrink a film on a container. FIGs. 7-10 illustrate similar views for alternate perforation pattern embodiments. It is noted that any feature or the various embodiments can be interchanged within the other embodiments.

[0041] As to FIG. 6, the vertical perforations 32 converge as they approach and terminate at the horizontal line 34. Large cuts 66 are added to the top end of the vertical perforations 32 to provide a splitting effect, a "V" 72, when applied to the container 10. The pair of "V"s 72 provides a peel tab 74 to allow easy removal by a user. It is noted that as a user pulls on the peel tab 74, a vertical tab 36 is generated as the shrink wrap ruptures between the perforations. It is also noted that any ruptured patterns allow a visual inspection of the container to reveal whether the container has

ever been opened or tampered with after shrink wrapping has been placed on the container.

[0042] FIG. 7 shows a variation of the position of the large cut 66 below the top edge 22 of the shrink wrap sleeve 30. In other words, the large cut 66 is placed below one or more normal perforation cuts on the top edge of the sleeve 30. In this instance, the heat shrinking separates the shrink wrap to form a circular opening to assist in developing a vertical tab 36 without forming a distinct peel tab 74.

[0043] FIG. 8 shows a variation of the perforation pattern by terminating the vertical perforations 32 before they reach the horizontal ring 34. This can be defined by not placing one, two, or three perforations before it reaches horizontal ring 34. For a container of about 80 mm in height, this non-perforated area 68 can have a dimension 70 of about 1 to 5 mm, and preferably about 1 to 2 mm. FIG. 9 illustrates where only one of vertical perforations 32 has a non-perforated area 68.

[0044] FIG. 10 illustrates a horizontal cut 78 so that as the vertical tab 36 is removed (See, e.g., FIG. 2) it separates from the shrink wrap sleeve 30 when it reaches the horizontal perforation ring.

[0045] In use, as shown in the sequence of Figures 2-4, a user can pinch the tab 74 and pull the shrink wrap toward the horizontal ring 34 to form the vertical tab 36 (FIG. 1). Depending on the perforation pattern, a user can continuously pull the vertical tab 36 until it approaches the horizontal ring 34, followed by a horizontal pull (FIG. 2) to continue the shrink wrap rupture of the horizontal ring perforations until an upper shrink wrap band 38 is removed (FIG. 3). Once the band 38 is removed, the lower shrink wrap band 40 remains and the product is ready for use.

[0046] The shrink wrap 30 can be formed by a blank 28 from a continuous film of PETG as shown in FIG. 12. As shown in FIG. 12, cut lines 50 define the size of the sleeve blank 28 as well as fold lines 48, seal area 42, copy limit 56, no live copy 58, no legal information 60 (since that portion on the shrink wrap will be removed prior to use), front panel print 62, and rear panel print 64. Once a blank has been formed, the film is sealed at the seal area 42 and the perforations 32 and 34 are added to form the shrink wrap seal that is ready for placement on the container 10. It is noted that there are limitless variations that are possible to forming blanks for heat shrinking onto a container.

[0047] While preferred embodiments have been described in detail, variations and modifications can be effected within the scope of the presented embodiments.

CLAIMS:

1. A container, comprising:

a container body having a circumference/perimeter variation along a vertical axis, a bottom surface, and a container opening having a top surface;

an axially oriented shrink wrap sleeve covering a portion of the body of the container having a circumference variation and a portion of the container opening, a top edge of the shrink wrap sleeve allowing the top surface to remain exposed, and a bottom edge of the shrink wrap sleeve allowing the bottom surface to remain exposed;

the shrink wrap sleeve having a pair of generally vertical perforations descending from the shrink wrap top edge towards a circumferential perforation ring oriented below the container opening;

wherein the shrink wrap sleeve covering a portion of the container body circumference variation has one of a smaller or larger circumference at at least one point between the circumferential perforation ring and the bottom edge as compared to adjacent portions of the circumference variation in order to prevent the shrink wrap sleeve from slipping off the container after removal of the portion thereof extending between the circumferential perforation ring and the top edge.

2. The container of claim 1, wherein the axially oriented shrink wrap sleeve covering a portion of the container body circumference variation has a greater circumference at at least one point between the shrink wrap top edge and the bottom edge.

3. The container of claim 1, wherein the axially oriented shrink wrap sleeve covering a portion of the container body circumference variation has a greater circumference at at least one point between the shrink wrap circumferential perforation ring and the bottom edge.

4. The container of claim 1, wherein the axially oriented shrink wrap sleeve covering a portion of the container body circumference variation has a smaller circumference at at least one point between the circumferential perforation ring and the bottom edge.

5. The container of claim 3, wherein the circumference variation is in the range of about 5 percent to about 200 percent.

6. The container of claim 5, wherein the circumference variation is about 100 percent.

7. The container of claim 1, wherein the generally vertical perforations descending from the shrink wrap top edge are progressively closer together as they approach the circumferential perforation ring.

8. The container of claim 7, wherein the generally vertical perforations descending from the shrink wrap top edge terminate at the circumferential ring.

9. The container of claim 7, wherein the generally vertical perforations descending from the shrink wrap top edge terminate at a space of about two perforations above the circumferential perforation ring.

10. The container of claim 7, wherein the generally vertical perforations descending from the shrink wrap top edge begin with an initial perforation cut, followed by relatively smaller perforation cuts, configured so that when the shrink wrap is applied to the container body, each of the larger cuts forming a 'V' shape at a top of each vertical perforation to define a tab between the vertical perforations.

11. The container of claim 1, wherein the container body has a generally planar front and rear surface, and a seal of the shrink wrap sleeve is vertically oriented along an edge of the rear surface.

12. A container, comprising:

a container body having a vertical axis, a bottom surface, and a container opening having a top surface;

a vertically oriented shrink wrap sleeve covering a portion of the container body and the container opening, a top edge of the shrink wrap sleeve allowing the top surface to remain exposed, and bottom edge of the shrink wrap sleeve allowing the bottom surface to remain exposed;

the shrink wrap sleeve having a pair of generally vertical perforations descending from the shrink wrap top edge towards a circumferential perforation ring

oriented below the container opening, wherein at least one of the pair of generally vertical perforations is spaced from the circumferential perforation ring by a distance corresponding to the length between two of the perforations of the at least one of the generally vertical perforations.

13. The container of claim 12, wherein the container body has a circumference variation along the vertical axis.

14. A shrink wrap sleeve suitable for a covering a portion of a container along a vertical axis having a circumference variation, comprising:

a top edge and bottom edge;

the shrink wrap sleeve having a pair of generally vertical perforations descending from the shrink wrap top edge towards a circumferential perforation ring, wherein at least one of the pair of generally vertical perforations is spaced from the circumferential perforation ring by a distance corresponding to the length between two of the perforations of the at least one of the generally vertical perforations.

15. The shrink wrap sleeve of claim 14, further comprising printed indicia.

16. The shrink wrap sleeve of claim 14, further comprising adhesive to bond to the container.

17. The shrink wrap sleeve of claim 14, wherein the shrink wrap sleeve is a polymer selected from the list consisting of: polyethylene terephthalate (PET), a copolymerized polyethylene terephthalate (PETG), polyethylene terephthalate glycol (PETG LV), polyvinyl chloride (PVC), polypropylene (PP), and polyethylene (PE).
18. The shrink wrap sleeve of claim 17, wherein the shrink wrap sleeve is PETG.
19. The shrink wrap sleeve of claim 17, wherein the sleeve is of a gauge of between about 40 to 55 microns.
20. The shrink wrap sleeve of claim 17, wherein the sleeve is of a gauge about 45 microns.
21. The shrink wrap sleeve of claim 14, wherein the shrink wrap sleeve has a shrinkage rate of about 75 percent to about 85 percent.
22. The shrink wrap sleeve of claim 14, wherein the shrink wrap sleeve has a shrinkage ratio of about 2:1.
23. The shrink wrap sleeve of claim 14, wherein the container opening is a flip top cap.