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(54) **BLISTER PACK FOR A CONTAINER**

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(57) **ABSTRACT**

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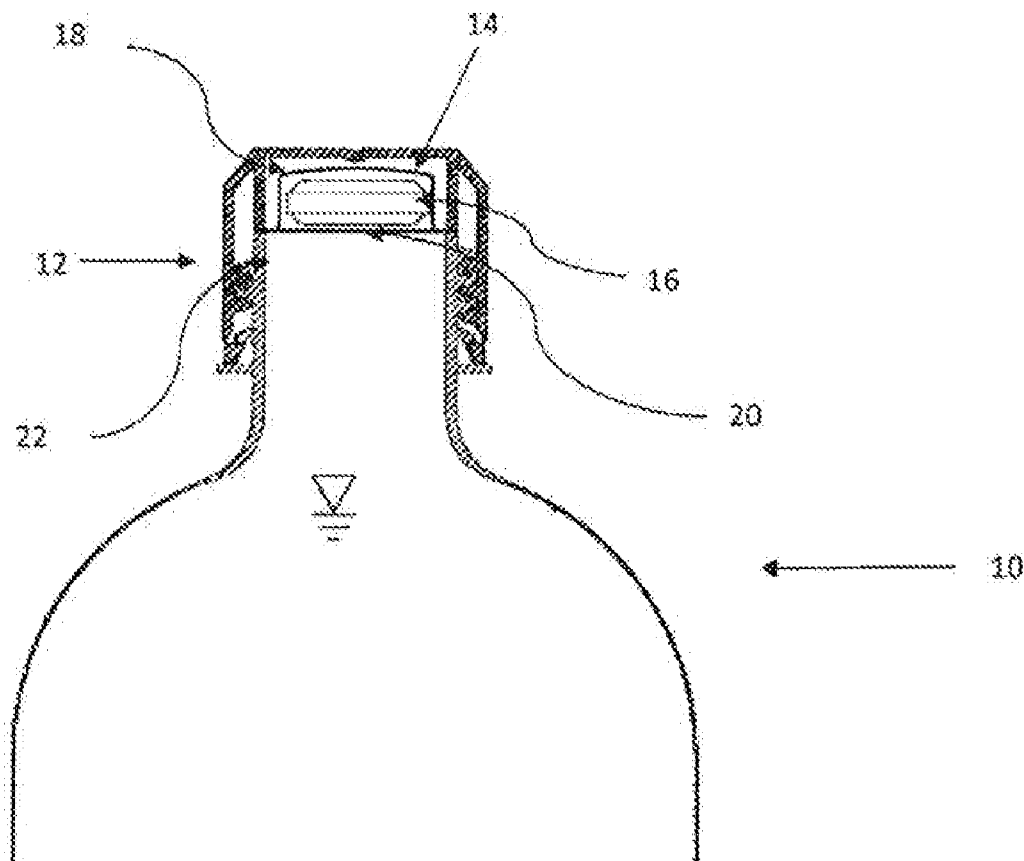
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The present invention relates to a blister pack sealed to the neck of a container and adapted to fit under the container lid forming a seal, said blister pack containing a liquid soluble material such as dissolvable aspirin. When force is applied to the blister pack, the base, which is comprised of a rupturable material, breaks and allows the liquid soluble material to be mixed with the liquid in the container. The blister pack remains as a seal for the container until it is desired that the user remove the blister pack for access to the container. The user can then re-seal the container using the container lid.



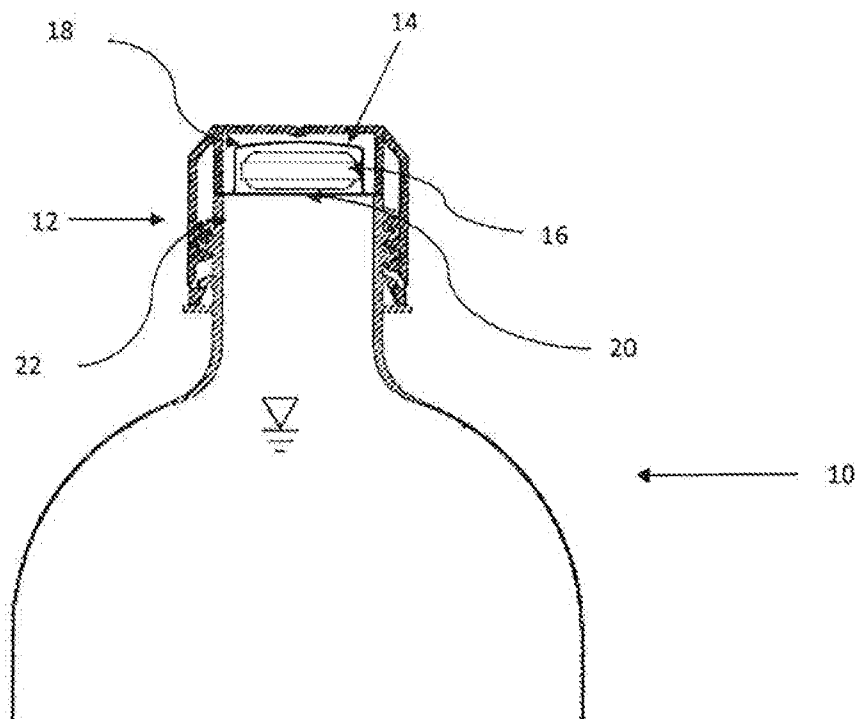


Fig 1

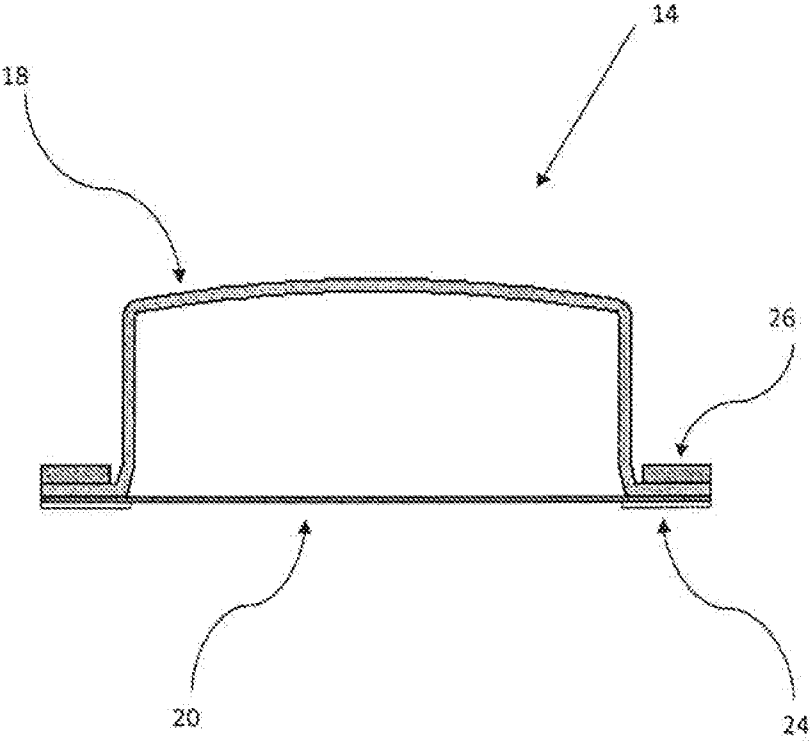


Fig 2

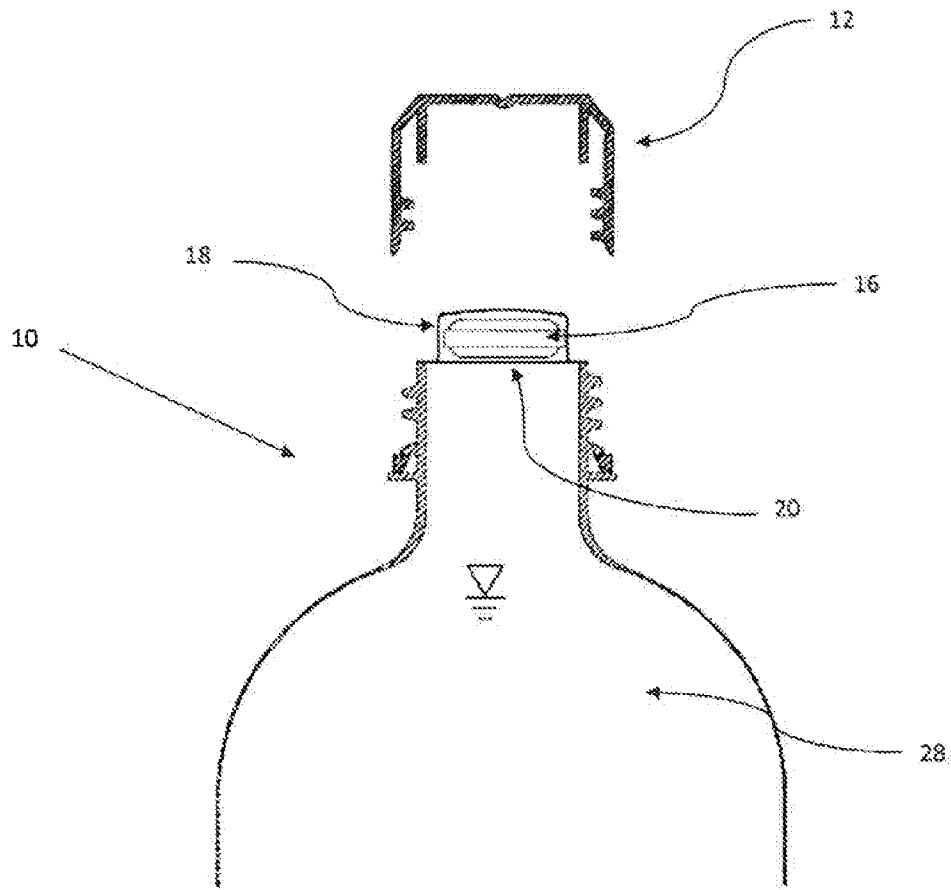


Fig 3

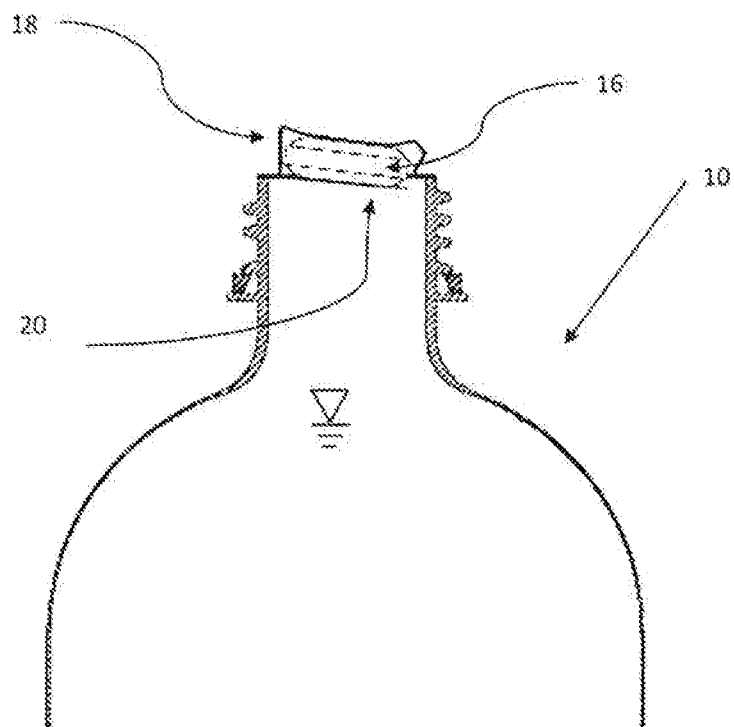


Fig 4

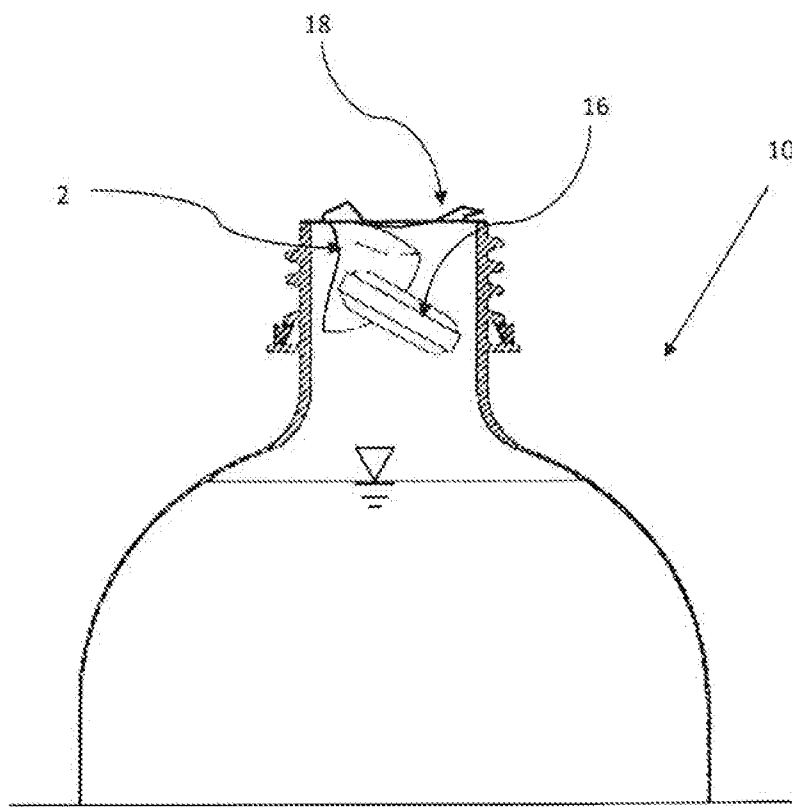
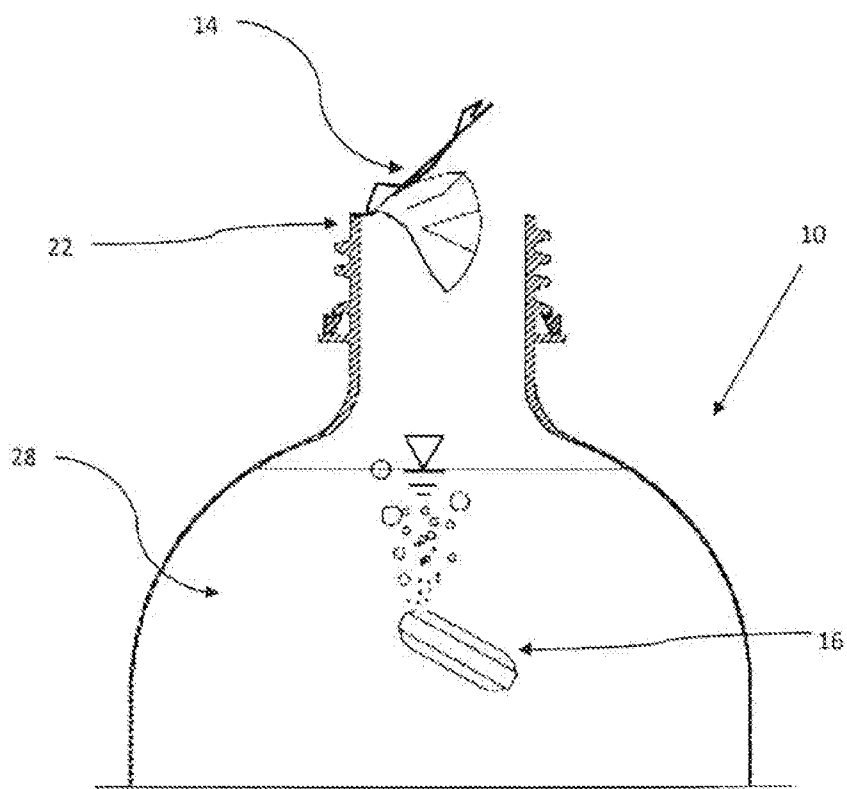


Fig 5



**Fig 6**

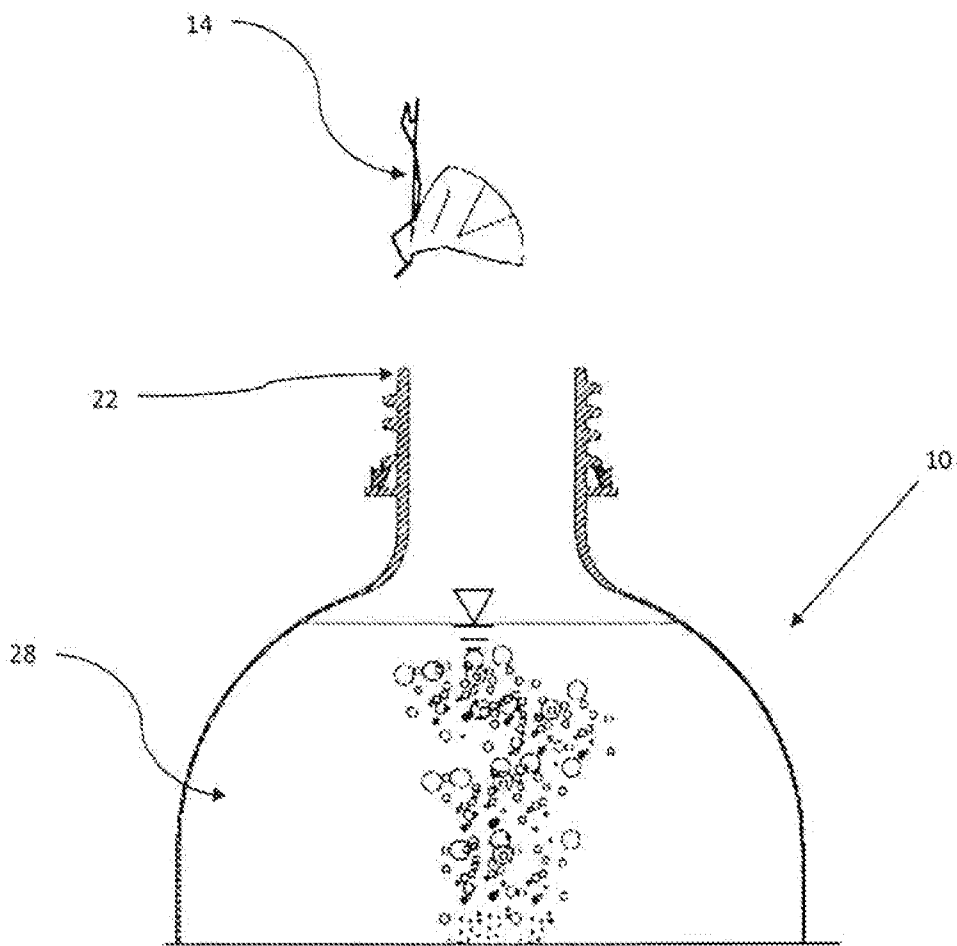


Fig 7



**BLISTER PACK FOR A CONTAINER**

## FIELD OF THE INVENTION

[0001] This invention relates to a blister pack, particularly for use with food and beverage containers.

## BACKGROUND TO THE INVENTION

[0002] Sealing methods for food and beverage containers are well known and varied, the most common being a cap or lid. Drinks which include another component or second component, such as a tablet or powder which is added to the liquid are growing in popularity. Usually this includes a blister pack contained in the lid which is adapted to store material separately from the liquid in the container.

[0003] It is preferable for the second component to be added immediately prior to consumption, especially when ingredients to be added are UV sensitive or do not have a long shelf life when mixed. Adding ingredients at the point of consumption also simplifies the production and filling of the beverages.

[0004] It is therefore known for a container to include a cap and powder or tablet holder, or blister pack, so that when pressure is exerted on the blister pack it allows the tablet to be mixed with the liquid in the container.

[0005] However, there are various disadvantages in the known prior art, for example, wherein the blister pack is completely broken by the initial force to release the material, and therefore does not remain sealed whilst the two components are being mixed. Furthermore, the container cannot be resealed once the tablet holder is broken and therefore the container cannot be reused. In many designs, the remains of the tablet holder, once broken, cannot be easily removed from the container, which may affect the drinking of the beverage and its reusability.

[0006] It is an object of the present invention to overcome these disadvantages or at least provide the public with a useful alternative.

## SUMMARY OF THE INVENTION

[0007] Therefore in one form of the invention there is proposed a blister pack for use with a container having a body and an opening, said blister pack characterised by a rupturable base and a cover of formable material, said base and cover defining at least one pocket which accommodates an element to be added to an existing contents of said container body, said blister pack being further adapted to seal said container opening.

[0008] Preferably said opening is associated with a neck portion of said container, said base extending across the opening such that an outer perimeter thereof is fixed to the neck and acts as an anti-tamper seal.

[0009] Preferably said base ruptures when a minimum amount of force is applied on said cover, causing said element to fall into the container body.

[0010] In preference the seal between the outer perimeter of the base and the container neck is such that rupture of said base to allow for said element to be added does not cause said seal to break.

[0011] In preference said seal is such that the blister pack can be manually detached from the neck of the container.

[0012] In preference said blister pack includes tabs which, when pulled, break said seal.

[0013] Preferably said container further includes a lid that is removably attachable from said neck such that when the lid is attached it envelops said blister pack.

[0014] Preferably said lid includes a means of sealing said opening when the blister pack has been removed.

[0015] Preferably said base is of a lower burst strength than said cover.

[0016] In preference the cover is of thermoformable or coldformable plastic.

[0017] Preferably the base is of aluminum.

[0018] In preference said existing content is a liquid and said element to be added is a liquid soluble material.

[0019] Alternatively said existing content is a liquid and said element to be added is a liquid soluble powder.

[0020] Alternatively said existing content is a liquid and said element to be added is a second liquid.

[0021] Preferably the rupturable base is porous and adapted to diffuse oxygen through said blister pack.

[0022] In a further form of the invention there is proposed a container including a blister pack as defined above.

[0023] In a still further form of the invention there is proposed a container including: a body portion carrying a liquid, said body portion including a neck having associated therewith an opening;

[0024] at least one blister pack including a base and a formable cover defining a pocket therebetween, said pocket adapted to accommodate an element to be added to said liquid, said base extending across the opening and including an outer perimeter that forms a seal between the blister pack and the neck portion of the container, said base further being rupturable such that when sufficient force is applied to the formable cover and element in a direction against said base, the base ruptures and said element is added to the liquid, said seal being such that the container remains sealed after force has been applied and said base portion ruptured.

[0025] Preferably said seal is achieved using an adhesive between the neck of the container and the outer perimeter of the blister pack base.

[0026] In preference said container further includes a removably attachable lid, said lid including a means of sealing said opening after the blister pack has been completely removed.

[0027] It should be noted that any one of the aspects mentioned above may include any of the features of any of the other aspects mentioned above and may include any of the features of any of the embodiments described below as appropriate.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0028] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate various implementations of the invention and, together with the description, serve to explain the advantages and principles of the invention. In the drawings:

[0029] FIG. 1 is a plan view of the upper portion of a beverage container, blister pack and tablet according to a preferred embodiment of the invention;

[0030] FIG. 2 is a plan view of the blister pack;

[0031] FIG. 3 is a plan view of the upper portion of a beverage container with the cap removed;

[0032] FIG. 4 is a plan view of the upper portion of a beverage container and the blister pack with force being exerted;

[0033] FIG. 5 is a plan view of the upper portion of a beverage container as the tablet has been forced through the blister pack;

[0034] FIG. 6 is a plan view of the upper portion of a beverage container with the tablet dissolving in the liquid; and

[0035] FIG. 7 is a plan view of the upper portion of a beverage container with the blister pack removed.

LIST OF COMPONENTS

- [0036] 10 Beverage container
- [0037] 12 Container lid
- [0038] 14 Blister pack
- [0039] 16 Tablet
- [0040] 18 Cover
- [0041] 20 Base
- [0042] 22 Container neck
- [0043] 24 Adhesive seal
- [0044] 26 Pulp
- [0045] 28 Beverage

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0046] The following detailed description of the invention refers to the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings and the following description to refer to the same and like parts. Dimensions of certain parts shown in the drawings may have been modified and/or exaggerated for the purposes of clarity or illustration.

[0047] Turning now to the drawings, there is illustrated in FIG. 1 a beverage container 10 comprising of a lid 12 and a blister pack 14.

[0048] The blister pack 14 includes a tablet or powder material 16 within a cover 18 made from formable materials such as thermoformable, coldformable plastic or aluminum and a rupturable base 20 made from, but not limited to paper, paperboard, plastic, or aluminum. The outer edges of the cover 18 and the base 20 are sealed together to form a pocket which contains the tablet, powder or liquid additive 16. It is to be understood that powder, tablets, liquids or any other materials can reside in the blister pack, depending on the desired beverage and component combination.

[0049] The outer edges of the cover 18 and base 20 are sealed to the neck 22 of the container 10 so that the blister pack 14 stretches across and covers the neck 22, forming an effective anti-tamper barrier. The blister pack 14 also creates a hermetic seal of the beverage, and is also a sterile seal for the dry powder or tablet material 16.

[0050] FIG. 2 illustrates the blister pack 14 separate from the container 10. To seal the blister pack 14 to the neck 22 of the container 10, an adhesive 24 is to be applied to the outer edges of the base 20. Where induction sealing is employed, an insulating pulp layer 26 is to be applied to the top surface of cover 18. This insulating pulp layer 26 will prevent the screw top lid from bonding with the thermoformable cover during the inductive heating of the foil. Other solutions to prevent fusion between the screw top lid 12 and the blister pack 14 may also be employed during the induction sealing process to the neck 22 of the container 10.

[0051] The blister pack 14 preserves freshness, authenticates product integrity, provides leak prevention, ensures consumer confidence, prevents product contamination

throughout the supply chain and provides tamper evidence. It is conveniently positioned atop the beverage container 10 and facilitates simple addition of the powder or tablet ingredients 16 to the beverage 28.

[0052] The lid 12 of the beverage container 10 may be screwed onto the container concealing the blister pack 14 beneath the lid 12. This will prevent the blister package 14 from being dispensed into the beverage 28 prior to point of sale. The lid 12 will be similar in appearance to lids presently used in capping beverage containers, however may require a taller height to facilitate the height of the tablet 16 enclosed beneath.

[0053] As illustrated in FIG. 3, the user unscrews the lid 12 from the beverage container 10, which may have a typical tamper evident sealing ring on the lid (not shown). With the lid 12 removed, the user is presented with the blister pack 14, which may be translucent or opaque. The blister pack 14 (if translucent) may show the tablet or powder ingredients 16 beneath, and may have instructions printed on the cover 18 instructing the consumer to press the tablet or powder 16 into the beverage 28.

[0054] When force is exerted onto the cover 18, preferably by a thumb or some other manual means, it pushes against the tablet 16, forcing the rupturable base 20 to break as illustrated in FIG. 4. Once sufficient force is exerted to push the table 16 completely through the base 20, the tablet 16 falls into the container 10 as illustrated in FIG. 5.

[0055] The cover 18 is therefore indented into the neck of the container, however because of the durability of the material and the seal to the container neck 22 the cover 18 does not rupture or come away from the container 10, but remains sealed. This allows the user to twist or shake the container 10 to mix the beverage 28 with the tablet 16 without having to be cautious that the liquid may spill and allows the tablet 16 to be completely dissolved into the beverage 28 before consumption.

[0056] While it is a preferred embodiment of the invention that the blister pack 14 consist of one pocket, it is to be understood that multiple pockets or compartments may be arranged on the common blister pack to the container, or on separate blister packs attached together to the container. Multiple pockets enable the consumer a choice of ingredients to add to the beverage or choice in strength of flavors added to the beverage.

[0057] The cover 18 may also have pre-weakened areas that allow the use of straws, for example, to allow a straw to penetrate through the pre-weakened area of the cover 18 and allow access to the beverage 24 while maintaining the seal.

[0058] An example of a container utilizing the blister pack seal would be a container of water and a soluble aspirin, whereby the aspirin is in the blister pack and is forced into the water, where it dissolves ready for the user to drink.

[0059] Another example would be a container of milk and the blister pack containing powdered flavours, whereby the user can prepare flavoured milk. This is a circumstance where multiple blister packs could be useful, so that the user could control the quantity of flavoured powder that they wished to add to the milk, or possibly add in different flavours according to taste.

[0060] The blister pack 14 also has a tab or tabs (not shown) on the perimeter of the pack. This tab facilitates the easy peeling of the blister pack from the neck of the container. The consumer can grip one of the tabs between their fingers and peel the blister pack seal from the container, removing it

entirely without leaving any residue and discarding it as illustrated in FIGS. 6 and 7. The blister pack 14 is also of a strength required to enable clean peeling off the neck 22 of the container 10.

[0061] The lid of the beverage container may then be re-screwed back onto the container after the blister pack seal has been removed, creating a water tight seal and allowing the container to be reused.

[0062] While it is a preferred embodiment of the invention that the container 10 be a PET bottle, it is to be understood that the invention can be applied to containers of all materials, including glass.

[0063] A further feature of the invention is the design of a porous blister pack 14 to absorb gasses such as oxygen from the headspace of the container 10. The base 20 would be adapted to diffuse oxygen through the blister pack 14, but not liquids, therefore reducing the oxidation of beverages such as wine but not allowing the liquid itself to break through the seal created by the blister pack 14.

[0064] Another possible embodiment of the invention is a lidless container, with the blister pack acts as the sealing means. This would be useful with food products or yoghurt tubs, where there is a solid food element such as fruit or nuts can be added to the yoghurt at the time of consumption and there is no need to reuse the container.

[0065] Yet another embodiment of the invention is an inverted blister pack, whereby the blister pack resides inside the neck of the container instead of across the opening. This therefore allows a regular lid to be employed with the container, rather than a taller lid in order to facilitate the height of the blister pack.

[0066] The blister pack 14 for the beverage container 10 can be applied to the beverage container using numerous methods and adhesion techniques. The common adhesion techniques to seal the blister pack 14 to the beverage container 10 are either solvent or water based adhesive, pressure sensitive adhesive (PSA), or heat sealing. Heat sealing can be accomplished using either conductive heat transfer, or induction.

[0067] Solvent or water based adhesion requires application of the solvent which has potential to be a messy process and the adhesive requires drying time. Pressure sensitive adhesion is pre dried, however requires a backing to be removed which has potential to be wasteful. In addition pressure sensitive adhesion requires a machine to press the blister pack 14 onto the beverage container 10 creating the pressure upon the PSA to create the desired bond. A uniform pressure is required to be applied around the circumference of the beverage container neck 22 to achieve uniform adhesion. This demands tight manufacturing tolerances on the beverage container 10 as slight deviation in height around the neck 22 of the container will result in deviations in pressure applied to the adhesive by the lidding machine.

[0068] Heat sealing is the preferred method of adhesion of the blister pack 14 to the beverage container 10 for this invention. In this process, a thermoplastic is welded to the beverage container surface in order to produce a seal of sufficient strength. When the polymer surface is in the molten condition and brought into intimate contact with another substrate a strong bond is achieved. The heat can be produced by either conduction, or induction.

[0069] Conductive heating machines require time to heat the pressing element which prolongs start up conditions of the packaging line. Conductive sealing, like PSA sealing, also

requires tight manufacturing tolerances in the beverage container height to ensure uniform pressure is applied for the molten thermoplastic to be adhered to the beverage container 10.

[0070] Induction sealing is the preferred adhesion method. Induction can be used to heat the aluminum foil which conducts heat into the thermoplastic causing this to melt. Induction heating is contactless on the production line, and only heats metallic elements (the foil covering). In this manner induction can be used to heat seal the blister pack 14 onto the container 10 after the lid 12 has been screwed onto the container. In this manner, the blister pack 14 can be supplied already inserted into the container lids 12. After the container 10 has been filled on the production line, the lid 12 (with blister pack 14 and dry tablet ingredients 16 within it) is screwed onto the container 10.

[0071] The lid 12 has a mating surface to seal against the upper neck 22 of the container 10. The outer circumference of the blister pack 14 is sandwiched between the lid 12 and the neck 22 of the container. The interaction between the lid 12 and the container neck 22 generates the required pressure between the thermoplastic adhesive layer and the container. With the lid 12 screwed onto the container 10, the lid 12, container 10 and blister pack 14 are passed beneath an induction heater on the production line heating the aluminum foil which in turn melts the thermoplastic adhesive layer creating a strong bond.

[0072] The blister pack 14 may require a pulp backing to the surface under pressure against the lid 12. The pulp backing is intended to insulate the surface mating with the lid 12 and prevent undesirable bonding between the lid 12 and the blister pack 14.

[0073] Tab(s) hold the blister pack 14 in position within the lid 12 as described above. They may also facilitate holding the tablet 16 and blister pack 14 within the lid 12 of the container 10 prior to applying the lid 12 to the container 10 in the filling line process. The tablet 16 and blister pack 14 can be pushed into the lid 12 prior to applying the lid 12 to the container 10. The outside diameter of the blister pack 14 will be a clearance fit within the lid 12 of the container 14, the tabs however will create a diameter larger than the internal diameter of the lid 12, thus an interference fit of the tabs only. When the tablet 16 and blister pack 14 are pushed into the lid 12, the tabs will fold downward as it interacts with lid 12. With the tabs folded downward, this may act as a ratchet against the internal threads of the lid 12. This ratchet action will be sufficiently strong to hold the blister pack 14 and tablet 16 contents in place within the lid 12 prior to applying the lid on the filling line.

[0074] Induction heating can also be applied to the blister pack 14 before the lid is screwed on. This method does however require a mechanical means to create the required pressure between molten thermoplastic and the beverage container 10.

[0075] The suggested method of filling the containers in a production line would be to contract the manufacture of powder or tablet ingredients 16, along with packaging these into the abovementioned blister packaging to a third party pharmaceutical company. These blister packages 14 could be supplied to the manufacturer of the lids 12 for the beverage containers. At completion of the injection molding process of the lids 12, the blister packs 14 could be stamped to the required shape, and pressed into the lids 12.

[0076] Inserting the blister pack 14 within the lids 12 at manufacture, rather than later, is advantageous in that the lids 12 are already arranged and grasped by the molding machine. Inserting the lids 12 at a later stage can also be accomplished however the lids 14 need to be sorted, arranged in the correct orientation grasped and have the blister pack 14 pushed in.

[0077] The lids 12 can be supplied to the bottling line with the blister packs 14 within the lid 12. This is presently undertaken with existing foil seals for beverage containers. In this manner, the lid 12 is screwed onto the container 10 after filling in a normal manner, and is then passed through an induction heater.

[0078] It may also be possible to press the blister packs 14 into the lid 12 (within the bottling line facility) immediately prior to screwing the lid 12 onto the container 10. This may provide fewer Stock Keeping Units (SKUs) for the bottling line however requires additional infrastructure for the bottling company over having the lids supplied with the blister pack 14 already within the lid 12.

[0079] Further advantages and improvements may very well be made to the present invention without deviating from its scope. Although the invention has been shown and described in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope and spirit of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus. Any discussion of the prior art throughout the specification should in no way be considered as an admission that such prior art is widely known or forms part of the common general knowledge in this field.

[0080] In the summary of the invention, except where the context requires otherwise due to express language or necessary implication, the word "comprising" is used in the sense of "including", i.e. the features specified may be associated with further features in various embodiments of the invention.

1. A blister pack for use with a container having a body and an opening, said blister pack by including a rupturable base and a cover of formable material, said base and cover defining at least one pocket which accommodates an element to be added to existing contents of said container body, said blister pack being further adapted to seal said container opening.

2. The blister pack as defined in claim 1 wherein said opening is associated with a neck portion of said container, said base extending across the opening such that an outer perimeter thereof is fixed to the neck and acts as an anti-tamper seal.

3. The blister pack as defined in claim 2 wherein said base ruptures when a minimum amount of force is applied on said cover, causing said element to fall into the container body.

4. The blister pack as defined in claim 3 wherein the seal between the outer perimeter of the base and the container neck is such that rupture of said base to allow for said element to be added does not cause said seal to break.

5. The blister pack as defined in claim 2, wherein said seal is such that the blister pack is manually detachable from the neck of the container.

6. The blister pack as defined in claim 2, wherein said blister pack includes tabs which, when pulled, break said seal.

7. The blister pack as defined in claim 5 wherein said container further includes a lid that is removably attachable from said neck such that when the lid is attached it envelops said blister pack.

8. The blister pack as defined in claim 7 wherein said lid includes a means of sealing said opening when the blister pack has been removed.

9. The blister pack as defined in claim 1, wherein said base is of a lower burst strength than said cover.

10. The blister pack as defined in claim 1, wherein the cover is of thermoformable or coldformable plastic.

11. The blister pack as defined in claim 1, wherein the base is of aluminum.

12. The blister pack as defined in claim 1, wherein said existing content is a liquid and said element to be added is a liquid soluble material.

13. The blister pack as defined in claim 1, wherein said existing content is a liquid and said element to be added is a liquid soluble powder.

14. The blister pack as defined in claim 1, wherein said existing content is a liquid and said element to be added is a second liquid.

15. The blister pack as defined in claim 1, wherein the rupturable base is porous and adapted to diffuse oxygen through said blister pack.

16. A container including a blister pack as defined in claim 1.

17. A container comprising:  
a body portion carrying a liquid, said body portion including a neck having associated therewith an opening;  
at least one blister pack including a base and a formable cover defining a pocket therebetween, said pocket adapted to accommodate an element to be added to said liquid, said base extending across the opening and including an outer perimeter that forms a seal between the blister pack and the neck portion of the container, said base further being rupturable such that when sufficient force is applied to the formable cover and element in a direction against said base, the base ruptures and said element is added to the liquid, said seal being such that the container remains sealed after force has been applied and said base portion ruptured.

18. The container as defined in claim 17 wherein said seal is achieved using an adhesive between the neck of the container and the outer perimeter of the blister pack base.

19. The container as defined in claim 17 wherein said container further includes a removably attachable lid, said lid including a means of sealing said opening after the blister pack has been completely removed.

20. (canceled)

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