

FIG. 1

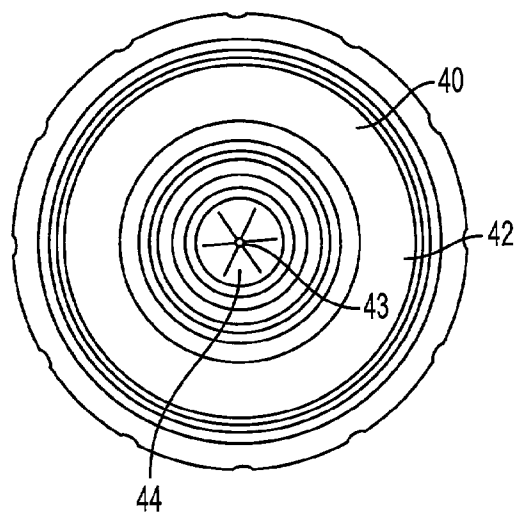


FIG. 3

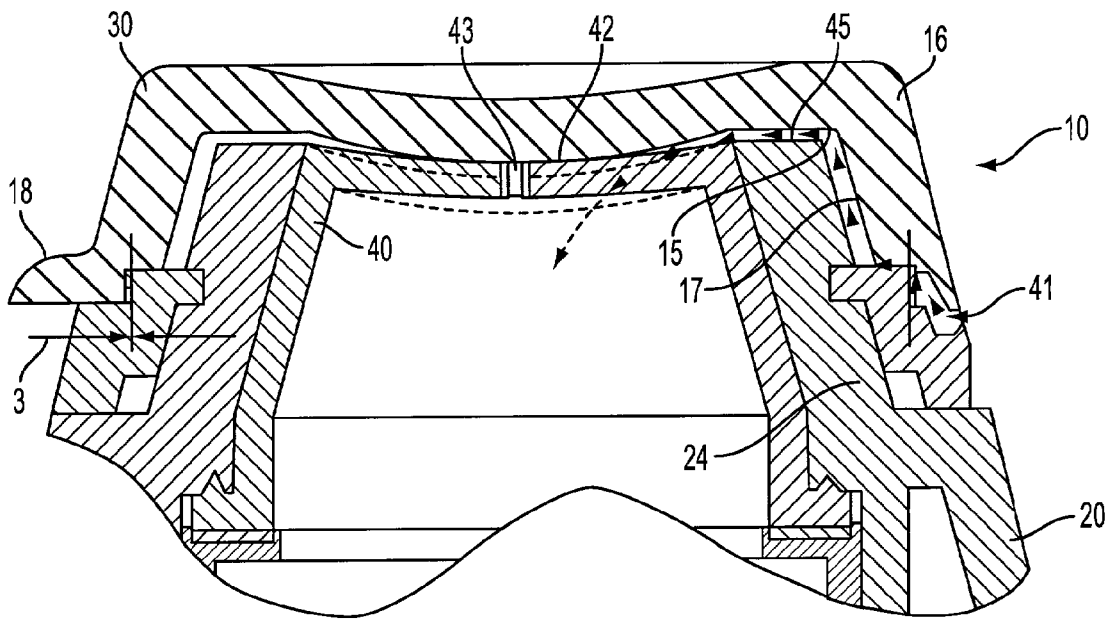


FIG. 2

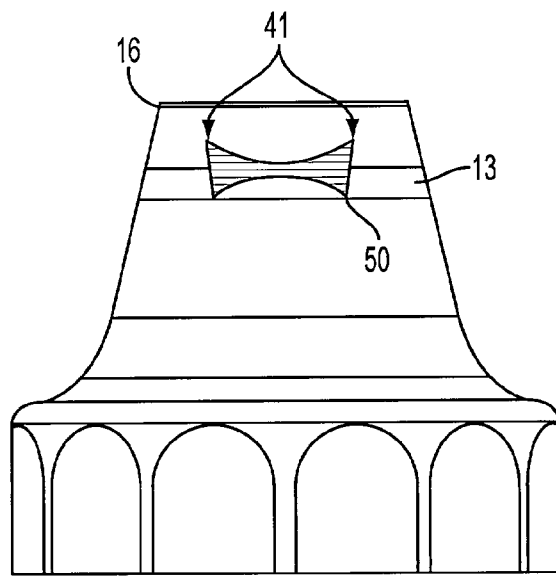


FIG. 4

## CONTAINER CLOSURE HAVING AN AIR INTAKE VALVE

### CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This is a non-provisional counterpart to U.S. Provisional Application Serial No. 60/281,599, filed on Apr. 4, 2002.

### STATEMENT RE: FEDERALLY SPONSORED RESEARCH AND DEVELOPMENT

[0002] None.

### REFERENCE TO A SEQUENCE LISTING

[0003] None.

### BACKGROUND OF THE INVENTION

[0004] Closures and valves for various containers are, of course, well known and are disclosed in numerous publications and patents. Many of the patents are owned by the assignee herein.

[0005] Closures serve both utilitarian and aesthetic functions. Many containers with closures today are equipped with valves, often made from thermoplastic elastomer. Such valves facilitate generally the one-way flow of the product, prevent spillage and may be created in several ways including being molded (as opposed to being subsequently cut), stretched and punched or laser pierced.

[0006] One of the problems facing the industry of consumer goods containers, which are often air-tight is the unsaleability of some goods due to "paneling"—or the drawing inward and distorting of the configuration of the containers because of environmental, storage, transport or other conditions such as temperature and elevational changes. Many retail consumers believe that paneled goods are damaged goods which therefore end up sitting on the store shelf, unsold.

[0007] It is therefore an object of the invention to provide a container closure having an air intake valve which reduces or eliminates paneling.

[0008] Another object of the invention to provide a container closure having an air intake valve which reduces or eliminates paneling in a simple, cost effective manner.

### BRIEF SUMMARY OF THE INVENTION

[0009] These and other object of the invention, which shall be hereafter apparent, are achieved by a container closure having an air intake valve, in which the covercap makes direct contact with the (TPE) valve top slit area only, but not with the outside slit area of the valve face, leaving an air space. With the cover cap in place and covering the concave (TPE preferably) valve, the slit or slits are restricted from opening outward because of the bottom contour contact fit of the cover cap. The flexible slit valve pieces are however unrestricted from moving inward and open automatically to let air in when necessary and eliminates the paneling affect. In the closed position, the cover cap is designed not to be completely airtight with two butt joint areas on the hinge side of the cap. This enables air to enter

around the hinge, into the cap interior circumference, down through the flexible valve and into the main container.

### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0010] The invention will be better understood by the Detailed Description of the Invention, with reference to the drawings, in which:

[0011] **FIG. 1** is a cross-sectional view of a container closure having an air intake valve according to the invention;

[0012] **FIG. 2** is a detailed cross-sectional view of the container closure having an air intake valve showing the airway from outside the container closure and leading into the body of the container;

[0013] **FIG. 3** is a perspective view of a valve used with the invention; and

[0014] **FIG. 4** is a perspective view of a container closure having an air intake valve, showing also a base cap and two air slots on the cover cap on either side of a living hinge on the cover cap.

### DETAILED DESCRIPTION OF THE INVENTION

[0015] Referring now to the drawings, in which like numerals depict like elements throughout the various views, **FIG. 1** is a cross-sectional view of a container closure **10**, preferably (although not necessarily) a base cap **20** and a covercap **30** intended to be used on a flexible-walled container (not shown) and is similar to applicants' copending U.S. application Ser. No. \_\_\_\_\_.

[0016] The covercap **10** includes generally a lid **16** and an overlapping snap ring **13** to fit over the base cap **20**. To assemble the snap ring **13** to the base cap **20**, the ring **13** is placed over the lip **24** of the base cap **20** and snapped into place. The lid **16** has a lifting tab **18**, which facilitates the opening of the cap **10** merely by one's finger.

[0017] **FIG. 2** is a detailed, cross-sectional view of the container closure **10** having an air intake valve **40** and also showing an airway **41** beginning from outside the container closure **10** around each side of a living hinge **50** connecting the snap ring **13** and the lid **16**. The airway **41** continues upwardly along the inside wall **17** of the lid **16** and turning perpendicularly along the lid ceiling **15** and between the ceiling **15** and the upper face **42** of the valve **40** and entering the body of the container through a slit **43** in the valve **40**. The preferably thermoplastic elastomer (TPE) valve is designed to dispense product and, with the lid **16** in place, enables a minimal amount of air to enter the container. This one way directional airflow eliminates the paneling problem from the flexible walls of a container.

[0018] In operation, the inside design of the cover cap **30** makes direct contact with the (TPE) valve top slit area **44** only (see **FIG. 3**). The cover cap **30** does not make significant contact with the valve **40** outside slit area **44**, leaving the air space **45**. With the lid **16** in place and covering the soft concave (TPE) valve, the slit or slits **43** are restricted from opening outward because of the bottom contour contact fit of the cover cap **30**. The flexible slit valve pieces are

unrestricted from moving inward and open automatically to let air in when necessary and eliminating the paneling affect.

[0019] In the closed position, the top snap cover cap is designed not to be completely airtight with two butt joint areas on the hinge **50** side of the cap **30**. This enables air to enter around the hinge **50**, up into the cap interior circumference, down through the flexible valve **40** and into the main container as described.

[0020] The valve slit **43** may be created in several ways, including being molded (as opposed to being subsequently cut), stretched and punched or laser pierced. The valve can also be placed inside the syerisis trap channel and held in place with a separate locking retainer piece. The valve can be co-injected and fused to the overcap ring or molded in the nozzle of the base cap. The valve can also be insert molded or manufactured as a separate piece held in place by the overcap ring.

[0021] The base cap **20** in this embodiment has trap channel **35** so that when the container is tipped slightly (for instance if a liquid and a portion of the product separates from the product because of the differing viscosities) the

liquid is trapped in the channel created between the inner side wall **36** of the base cap **20** and inner channel guide **37**.

[0022] While the preferred embodiment of the invention has been depicted in detail, modifications and adaptations may be made thereto, without departing from the spirit and scope of the invention as delineated in the following claims:

1. A container closure, comprising:  
a cover cap; and  
passage permitting air to enter into said container when said closure is in a closed position.
2. The closure of claim 1, further comprising a valve member.
3. The closure of claim 2, wherein said valve member includes at least one opening.
4. The closure of claim 3, wherein said passage and said at least one opening are in communication.
5. The closure of claims, wherein said communication is facilitated by contact of the underside of the cover cap with the surface of the valve.

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