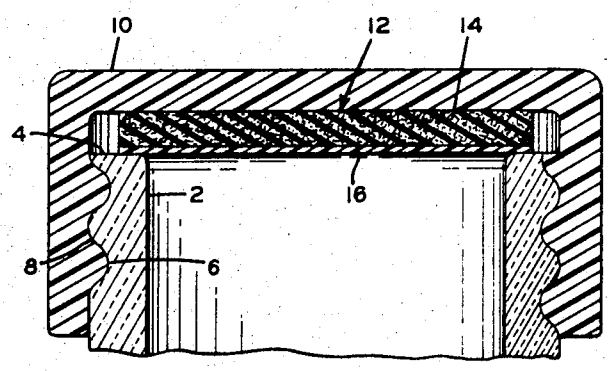
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VENTED CLOSURE

Filed June 26, 1968



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VENTED CLOSURE

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ABSTRACT OF THE DISCLOSURE

A self-venting closure for containers which tends to build up internal vapor pressure. Containers often carry liquids which, due to storage in warm places, exposure to sunlight or subjection to agitation, will build up internal vapor pressures within the container in which they are confined. The liner for the self-venting closure cap permits the escape of gas to relieve the internal buildup of pressure. The liner is composed of an asbestos-fiber backing with a facing of fibrous, semi-permeable, spun-bonded polyethylene which permits the passage of gases, but is not destroyed by liquid wetting and greatly inhibits the passage of liquid.

CROSS REFERENCE TO RELATED APPLICATION

The self-venting closure herein is an improvement over the closure of application Ser. No. 739,321 filed June 26, 1968 in the name of Gerald L. Roy.

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates to new and useful improvements in a closure means for containers, and more particularly a closure means which will vent when the internal pressure developing in the container becomes excessive.

Description of the prior art

Numerous venting structures are available for relieving the stress pressure buildup within a container. Patent No. 2,424,801 discloses one type of venting structure wherein the glassware neck is provided with a special configuration which will permit gas to escape after the gas buildup has reached a point where it will lift the liner off the neck of the glassware.

Patent No. 3,114,467 discloses another type of self-venting bottle cap wherein the bottle cap is provided with a special structure which permits the liner to rise up under the action of the buildup of gas pressure. The raising of the liner away from the neck of the glassware then permits the gas to escape. These above structures currently available on the open market suffer from one major deficiency. While the structures will permit gas to escape, they are also equally suitable for permitting liquid to escape. Turning of the bottle upside down will permit the liquid to act on the venting structure and escape in the same manner as the gas would escape. This limitation makes the product very difficult to maintain from a packing and shipping point of view since the container must always be maintained in its upright position or else there will be leakage. The self-venting closure herein differs from the closure of the above-mentioned application in that a facing material of substantially less expense is used and the pulpboard backing has been replaced with an asbestos-fiber backing which is particularly resistive to attack by bleach.

The primary object of the self-venting closure herein is to provide a structure which will permit bleach bottles to vent, but prevent the deterioration of the liner due to any wetting of the liner by bleach.

SUMMARY OF THE INVENTION

In the forming of conventional closures with liners, the liner is usually formed of a pulpboard material fastened to the inside of the closure and having a thin disc of any suitable facing material disposed over the pulpboard material to protect it against deterioration by the contents of the container and contamination of the contents of the container by the liner material. The facing material is completely impervious to liquid and gas.

It is proposed to use in a closure a beater-saturated, asbestos-fiber lining material in lieu of the pulpboard lining material and to replace entirely or in part the conventional impervious facing material with a fibrous, spunbonded, semi-permeable polyethylene. The lining material and the facing will be of the same relative thickness as the conventional materials. The new facing material is semi-permeable in that it will permit the passage under normal circumstances of gas, but will prevent normally the passage of liquid. However, there may be a slight wetting of the liner material by the liquid contained within the container. The beater-saturated asbestos-fiber lining material will not be affected by any liquid wetting and this material is capable of permitting the passage of gas. Consequently, the excess pressure due to gas is relieved by the gas passing through the facing material, the lining material and out around the threads of the closure to the atmosphere.

BRIEF DESCRIPTION OF THE DRAWING

The single figure of the drawing is a cross-sectional view of the closure with a liner mounted on the neck of the container.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The neck **2** of a conventional container has a substantially flat upper surface **4** against which the liner presses to form a liquid-tight seal. Threads **6** on the container engage with threads **8** of a conventional closure **10**. The closure has a lining **12** which is composed of a lining material **14** and facing **16**. The use of a two-part liner with a closure is conventional in the art as shown in Patent No. 2,359,924. The difference over the prior art is that the facing material **16** is not the conventional nonporous sheet material normally used as a facing. It is proposed to use a fibrous, spinbonded polyethylene as a facing material. An example of a spun-bonded polyethylene available for use is the material sold under the trade name "Tyvek" by du Pont Company, Inc. Tyvek is a material composed of randomly arranged, continuous filament fibers which are spun by textile fibers and heat sealed to one another to form a web. The material forms a membrane which has the ability under normal operating conditions to permit the passage of gas, but to prevent the passage of liquid. As such, it functions as a semi-permeable membrane. However, it has been found that this material, when used with bleach or other corrosive liquids, has a tendency to permit wetting of the backing material, and the corrosive liquids attack the backing material causing its deterioration.

Consequently, instead of using the conventional pulpboard lining material as a backing, a beater-saturated, asbestos-fiber felt has been used as the lining material.

An acceptable liner has been formed by using an asbestos sheet material sold under the trade name "Hydrocord" by Armstrong Cork Company and fully described in Patent No. 2,759,813. This asbestos-fiber sheet is then covered with a facing of spun-bonded polyethylene which has a thickness of 4 to 9 mils and a denier per filament of less than 1. As indicated above, the lining material is

the commercially available Hydrocord and the facing is the commercially available Tyvek. Tests with this liner have shown that this particular structure readily vents the buildup of internal pressure within the bleach bottle, but the semi-permeable membrane facing prevents the bleach liquid from leaking past the facing when the bleach bottle is upside down. What minor wetting of the lining material that may occur to the lining material is ineffective to damage the asbestos-fiber lining material. Consequently, the lining material is able to resist deterioration and continue its function as the backup for the facing to maintain the seal between the flat surface on the top of the neck of the bottle and the inside of the closure. Maintenance of the effectiveness of the liner thus prevents the bleach from working its way past the liner to drip down the outside surface of the bottle and attack the bottle label, the packing case carrying the bottle or the shelf supporting the bottle in the store.

What is claimed is:

1. A self-venting closure cap for a container having a threaded neck portion presenting a circular rim, said cap including a cap body having a crown portion and a depending internally threaded skirt design for threaded engagement with the threaded neck portion of the container, the inside face of the crown portion of the cap receiving a liner

composed of an asbestos-fiber lining material at least partly faced with a fibrous, spun-bonded sheet material which constitutes a means for venting the internal gas pressure buildup within the container while at the same time preventing the passage of liquid past the facing material.

2. The self-venting closure cap of claim **1** wherein the lining material is a beater-saturated, asbestos-felt sheet and the facing material is composed of randomly arranged continuous filament fibers which are spun-like textile fibers and heat sealed to one another to form a web.

3. The self-venting closure cap of claim **2** wherein the cap is used in combination with a container containing bleach.

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3,071,276 1/1963 Pallett et al. ---------- 215—56

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GEORGE T. HALL, Primary Examiner

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