VENTED FLEXIBLE FITMENT

Abstract

A fitment is provided that includes a body, a cap and a membrane. The body has a first end and a second end. The body further has a body passage that extends between the first end and the second end. The cap has a first end and a second end. The cap has a cap bore that extends in the first end of the cap. The cap is configured to selectively plug the body passage proximate the second end of the body. The membrane is in the second end of the cap. The membrane is configured to allow two-way venting through the body passage of the body when the cap is plugging the body passage.
VENTED FLEXIBLE FITMENT

BACKGROUND

[0001] One type of container commonly used for storing products is a flexible pouch. A flexible pouch however has its limitations. For example, some stored products require ventilation. For example, a product such as a peroxide acid cleaner requires a ventilation system in the container it is stored with. Hence, flexible pouches may be limited in use.

[0002] For the reasons stated above and for other reasons stated below which will become apparent to those skilled in the art upon reading and understanding the present specification, there is a need in the art for an effective and efficient ventilation system for a flexible pouch.

SUMMARY OF INVENTION

[0003] The above-mentioned problems of current systems are addressed by embodiments of the present invention and will be understood by reading and studying the following specification. The following summary is made by way of example and not by way of limitation. It is merely provided to aid the reader in understanding some of the aspects of the invention.

[0004] In one embodiment, a fitment is provided. The fitment includes a body, a cap and a membrane. The body has a first end and a second end. The body further has a body passage that extends between the first end and the second end. The cap has a first end and a second end. The cap has a cap bore that extends into the first end of the cap. The cap is configured to selectively plug the body passage proximate the second end of the body. The membrane is in the second end of the cap. The membrane is configured to allow two-way venting through the body passage of the body when the cap is plugging the body passage.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The present invention can be more easily understood and further advantages and uses thereof more readily apparent, when considered in view of the detailed description and the following figures in which:

[0006] FIG. 1A is a side perspective view of a fitment of one embodiment of the present invention;

[0007] FIG. 1B is a close up view of a membrane in a cap of the fitment of FIG. 1A;

[0008] FIG. 2 is a side view of the fitment of FIG. 1A with the cap of the cap pluging a body passage of the fitment;

[0009] FIG. 3 is a side view of a flexible pouch including the fitment of FIG. 1A;

[0010] FIGS. 4A through 4C are side views of a connector and the fitment of FIG. 1A in different configurations; and

[0011] FIGS. 5A through 5C are side views of a connector and another fitment of another embodiment of the present invention in different configurations.

[0012] In accordance with common practice, the various described features are not drawn to scale but are drawn to emphasize specific features relevant to the present invention. Reference characters denote like elements throughout Figures and text.

DETAILED DESCRIPTION

[0013] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the claims and equivalents thereof.

[0014] Embodiments of the present invention provide two-way venting for a container. In particular, embodiments provide two-way venting for a flexible pouch container. Referring to FIG. 1A, a side perspective view of a fitment 100 of one embodiment is illustrated. Fitment 100 includes a body 101 and a cap 110. The body 101 has a first end 103 and a second end 105. A body passage 106 passes through the body 101 from the first end 103 to the second end 105. Proximate the second end 105 of the body 101 the body passage 106 includes a lip 106a. Proximate the first end 103 of the body 101 is a base 102. The cap 110 includes a first end 111 and a second end 113. A cap bore 110c extends in the first end 111 of the cap 110, as illustrated. The cap 110 further includes a ridge 110a proximate its second end 105. The ridge 110a is designed to engage the lip 106a in the body passage 106 of the body 101 when the cap 110 is selectively coupled to the body 101. This arrangement secures the cap 110 to the body 101 when the cap 110 is plugged the body passage 106 of the body 101. The cap 110 also includes a cap lip 110b that is inside the bore 110c. The cap lip 110b is designed to selectively engage a connector as further described below. The cap 110 is coupled to the body 101 by opposed first retaining members 108a and a second retaining member 108b. The first retaining member 108a and the second retaining member 108b are made from a flexible material that allows the cap to move away from and towards the body passage 106 of the body 101. The cap 110 further includes a membrane 112 that extends between the cap bore 110c and the second end 113 of the cap 110. FIG. 1B illustrates a close up view of the membrane 112 in the cap 110. The membrane 112 provides two-way ventilation 109 and 111 between the body passage 106 of the body 101 and the outside when the cap 110 plugs the body passage 106 of the body 101.

[0015] Referring to FIG. 2, a side view of fitment 100 is illustrated. In this view, the cap 110 is coupled to the body 101 of the fitment 100. In this arrangement, the cap 110 plugs the body passage 106 of the body 101 and the membrane 112 provides two-way venting into and out of the body passage 106. In FIG. 3, a side view of a container, which in this embodiment is a flexible pouch 114 including a fitment 100, is illustrated. The flexible pouch 114 has a seal 114a around its outer perimeter. The body 101 of the fitment 100 includes a mid section 104 that is designed to be received in the seal 114a of the pouch 114. Hence, the fitment 100 has a first section including the cap 110 that is sealed inside the pouch 114 and a second section including the base 102 of the body 101 being positioned outside the pouch 114. In FIG. 3, the cap 110 is engaged in the body passage 106. In this configuration the membrane 112 allows two-way ventilation out of and into the pouch 114 through the body passage 106 of the fitment 100.

[0016] FIGS. 4A-4C illustrate the manipulation of the cap 110 of the fitment 100 by a connector 120. In particular, FIG. 4A illustrates a connector 120 that is going to be inserted into the body passage 106 of the body 101 proximate the base 102...
of the body 101. The connector 120 in this embodiment includes a connector passage 128 that passes from a first end 121 to proximate a second end 123. The connector passage 128, in this embodiment, terminates in a dispensing portion 126 that includes orifices 126a and 126b. The connector 120 includes a cap engaging portion 124 that is proximate the second end 123. The connector 120 further includes a mid-portion 125. The cap engaging portion 124 and the mid-portion 125 are received in the body passage 106 of the body 101 of the fitment 100 as illustrated in FIG. 4B. Cap engaging portion 124 further includes a cap connector recess 124a that is designed to engage the cap lip 1106 in the cap bore 110c of the cap 110. This arrangement couples the cap engaging portion 124 of the connector 120 in the cap bore 110c of the cap 110. The connector 120 being pushed into the body passage 106 forces the cap 110 out of the body passage 106 of the fitment 100 as illustrated in FIG. 4B. This allows the orifices 126a and 126b of the dispensing portion 126 of the connector 120 to allow product to flow out of a container such as pouch 114 of FIG. 3. This arrangement would also allow product to be placed into a container in this configuration.

[0017] Once the product has been removed or put into the pouch 114, the connector 120 is removed from the fitment 100, as illustrated in FIG. 4C. Since the cap engaging portion 124 is coupled in the cap bore 110c, the cap 110 is pulled into the base passage 106 of the body 101 of the fitment 100 thereby (once again) plugging the body passage 106 of the body 101 as the connector 120 is pulled from the body passage 106 of the fitment 100. Thus, in this embodiment the connector 120 selectively uncaps the cap 110 from the body 101 when the connector 120 is inserted in the body passage 106 of the body 101 to allow the product to be removed or added to the container. FIG. 4B illustrates a product flow 129 entering into the orifices 126a and 126b and a product flow 130 exiting the connector 120 when the cap 110 is removed from the body passage 106 of the body 101. Moreover, the connector further re-plugs the body passage 106 of the body 101 with the cap 110 when the connector 120 is removed from the fitment 100. Accordingly, in this embodiment, the membrane 112 only provides two-way ventilation out of the pouch 114 when the cap 110 is plugging the body passage 106 of the body 101 of the fitment 100. FIGS. 4A through 4C further illustrates a locking member 132 used to couple a product dispensing device (not shown) to the connector 120.

[0018] Reffering to FIGS. 5A-5C, another embodiment of a fitment 200 is illustrated. In this embodiment the fitment includes a body base 201 and a cap 210. The body base has a first end 203, a second end 205 and a mid-portion 204. The mid-portion 204 is designed to be enclosed in a seal similar to the mid-portion 104 of fitment 100 sealed in pouch 114 of FIG. 3. The cap 210 of this fitment 200 is slidably coupled to the body 201. The cap 210 includes a membrane 212 that allows two-way ventilation when the cap is positioned to plug a body passage 206 of the body 201. The connector 220 in this embodiment includes a first end 221 and a second end 223. Proximate the second end 223 of the connector 220 is a cap engaging portion 224 that includes a cap recess 224a that is designed to selectively engage the cap 210 similar to the engagement of cap engaging portion 124 and the cap 110 discussed in the previous embodiment. The connector 224 further has a mid-portion 225 and a connector passage 228. The connector passage 228 extends from the first end connector 221 to orifice 226a that is proximate the cap engaging portion 224. As FIG. 5A illustrates the connector 220 in this embodiment is inserted in the body passage 206 in the body 201 of the fitment 200. FIG. 5B illustrates the mid-portion 225 and connecting portion 224 of the connector being inserted into the body passage 206 of the body 201 of the fitment 200. When fully inserted into the body passage 206, the connector 220 provides a product flow through orifice 226 and out through connector passage 228. Also, when connector 224 is fully inserted in the body passage 206 of the fitment 200, the cap 210 is manipulated into a non-plugging position such that fitment 212 no longer provides two-way ventilation between the body passage and the contents of the pouch.

[0019] FIG. 5C illustrates the connector 212 being removed from the body passage 206 of the fitment 200. The cap engaging portion 224 pulls the cap 210 down into the body passage 206 to plug the body passage 206 of the fitment 200 as the connector 220 is being removed, similar to the embodiment as discussed above. The connector 220 in this embodiment is illustrated as further including a rim 224 that abuts a base 220 of the body 201 of the fitment 200 when the connector 220 is received in the body passage 206. The connector 220 further includes a connector portion 220 proximate the first end 221 of the connector 220 and a locking member 232 that are used to couple a product dispensing member (not shown) to the connector 220.

[0020] Although specific embodiments have been illustrated and described herein, it will be appreciated by those of ordinary skill in the art that any arrangement, which is calculated to achieve the same purpose, may be substituted for the specific embodiment shown. This application is intended to cover any adaptations or variations of the present invention. Therefore, it is manifestly intended that this invention be limited only by the claims and the equivalents thereof.

1. A fitment comprising:
   a body having a first end and second end, the body having a body passage extending between the first end and the second end of the body;
   a cap having a first end and second end, the cap having a cap bore extending into the first end of the cap, the cap configured to selectively plug the body passage proximate the second end of the body; and
   a membrane in the second end of the cap, the membrane configured to allow two-way venting into the body passage of the body when the cap is plugging the body passage.

2. The fitment of claim 1, wherein the body passage is configured to receive a connector passing through the first end of the body and out of the second end of the body.

3. The fitment of claim 1, wherein the cap is further configured to selectively engage an end of the connector when the connector is passed out of the second end of the body.

4. The fitment of claim 3, the cap further comprising: an inner cap ridge in the cap bore configured to engage a connector recess proximate the end of the connector to selectively engage the end of the connector.

5. The fitment of claim 1, wherein the cap is coupled to the body.

6. The fitment of claim 7, further comprising: a first retaining member coupled between the cap and the body; and
a second retaining member coupled between the cap and
the body, the second retaining member and the first
retaining member opposably positioned.
7. The fitment of claim 1, wherein a first portion of the body
is configured to be received within a flexible pouch proximate
the second end of the base.
8. The fitment of claim 1, wherein the cap is slidably
coupled to the body.
9. The fitment of claim 1, further comprising:
the cap including an outer ridge, and
the body passage having an internal lip, the internal lip
configured to engage the outer ridge of the cap when the
cap is plugging the body passage.
10. A fitment comprising:
a body having a first end and a second end, the body further
having a body passage extending between the first end
and the second end of the body, the second end config-
ured to be received in a flexible pouch;
a cap configured to selectively plug the body passage
proximate the second end of the body; and
a membrane in the cap that allows two-way venting when
the cap is selectively plugging the body passage.
11. The fitment of claim 10, further comprising:
the body further having a mid-portion extending between
the first end and the second end, the mid-portion config-
ured to be coupled in a seal of the flexible pouch.
12. The fitment of claim 10, further comprising:
the body passage configured and arranged to receive a
connector, the connector configured to pass product into
and out of the flexible pouch.
13. The fitment of claim 12, further comprising:
the cap configured to be manipulated by the connector
to selectively plug the body passage.
14. The fitment of claim 10, wherein the cap is retainably
attached to the body.
15. A product containment system comprising:
a container configured to hold a product;
a fitment coupled to the container, the fitment including,
a body having a body passage providing a product path
to the container,
a cap configured to selectively plug the body passage,
and
a membrane in the cap to allow two-way venting through
the body passage when the cap selectively plugs the
body passage; and
a connector having a connector portion configured to be
received in the body passage of the fitment to provide a
path for delivery and dispensing of the product to and
from the container, the connector further configured to
manipulate the cap to plug and unplug the body passage.
16. The product containment system of claim 15, wherein
the container is a flexible pouch.
17. The product containment system of claim 16, wherein
the fitment is positioned in a seal in the flexible pouch.
18. The product containment system of claim 15, wherein
the cap of the fitment is coupled to the body of the fitment.
19. The product containment system of claim 15, wherein
the cap of the fitment has a first end configured and arranged
to be selectively received in the body passage of the body, the
cap having a second end, the membrane positioned in the
second end of the cap.
20. The product containment system of claim 15, further
comprising:
a first retaining member coupled between the cap of the
fitment and the body of the fitment; and
a second retaining member coupled between the cap of the
fitment and the body of the fitment, the second retaining
member and the first retaining member opposably
positioned.
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