

SPECIFICATION

SEALED VESSEL

5 TECHNICAL FIELD

The present invention relates to an airtight container which consists of a container body and a screw cap, especially the container which can be seen the mixed condition of the contents that is good to use with mixing up uniformly, with the cap closed.

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BACKGROUND ART

In the prior art, if a container body should be made un-transparent considering the character of the contents or its design, the users can not see the mixed condition of the contents with a cap closed.

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When the said container includes the mixture of liquid and grains, or the mixture of liquids which the specific gravity is different, or the mixture of grains which grain diameter, grain shape, color are different, the users are used to be shaken too much because they can not see the mixed condition from outside. Also they can not get the effect of the contents expectedly because of forgetting to shake before using.

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If a side or a bottom of the container has a transparent part, it is possible to see the mixed condition of the contents through the part. But it isn't desirable because such a container complicates a manufacturing process and it causes a cost rise.

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Accordingly, it is an object of the present invention to provide a container which can be seen the mixed condition of the contents through an opening of container body.

It is another object of the present invention to provide a container which can be seen the mixed condition of the contents with a screw cap closed without adding an extra process even if the un-transparent container body should be used for the mixture.

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DISCLOSURE INVENTION

The present invention provides an airtight container having a transparent cylinder molded in the cap which has an internal thread for an external thread molded on the container neck.

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Furthermore, the present invention provides the airtight container

which can be seen the mixed condition of the contents with the screw cap closed because of making a zone of the screw cap transparent, where the opening lower of the container body touches, or the screw cap wholly transparent.

5 Furthermore, the present invention provides the airtight container which body is made by un-transparent material.

10 Furthermore, the present invention provides the airtight container, which the container body and the screw cap are made of synthetic resin and the material of the screw cap is harder than the material of the container body.

BRIEF DESCRIPTION OF DRAWINGS

15 These and other objects and features of the present invention will become clear from the following description taken in conjunction with the preferred embodiments thereof with reference to the accompanying drawings throughout which like parts are designated by like reference numerals, and in which:

 A preferred form of the present invention is illustrated in the accompanying drawings, in which:

20 Fig.1 is a perspective view showing an airtight container of the present invention.

 Fig.2 is an enlarged perspective view showing a screw cap.

 Fig. 3 is a schematic illustration showing the condition that the grains settle in the liquid.

25 Fig. 4 is a schematic illustration showing a confirmation zone (5) under the condition to shown in Fig.3 by seeing from the bottom.

 Fig. 5 is a schematic illustration showing an airtight container according to the second embodiment.

30 Fig. 6 is a schematic illustration showing the condition that the grains settle in the liquid.

 Fig. 7 is a schematic illustration showing the bottom of the screw cap under the condition to shown in Fig. 6.

 Fig. 8 is a schematic illustration showing an airtight container according to the third embodiment.

35 Fig. 9 is a schematic illustration showing an airtight container according to the fourth embodiment.

BEST MODE FOR CARRYING OUT THE INVENTION

The material of the container body and the screw cap of the present invention is synthetic resin. It is thermoplastic resin that is represented by polystyrene, polyethylene, polypropylene, polyvinyl chloride, and it is thermosetting resin that is represented by phenolic resin concretely.

And the material of the cap is harder than the material of the container body.

Then, as for this processing, by the way of well-known molding, for example, by an injection molding, a compression molding, a vacuum molding, a blow molding, and so on.

And the present invention can be used other materials corresponding to the kind of the contents in addition to the above materials if they can keep at least a characteristic of the present invention.

The airtight container (1) of the present invention consists of the container body (2) and the screw cap (3). The container body (2) is a rectangular parallelepiped.

The screw cap has a cylinder (4) in the center of the cap inward. The cylinder has an internal thread fitting an external thread molded on the neck outward of the container body (2). The screw cap has a zone. The zone at least, which the opening of the container touches is made transparent. And it is allowed to make the screw cap (3a) wholly transparent.

And, the form of the container body and the cap are not limited to the above form. It is allowed to form the container body cylindrical, spherical, and other forms. The screw cap isn't limited to a form shown in Fig. 2, either. However, as for the present invention, the screw cap is normally put downward, so at least its bottom is a plane surface, and there should be some area to keep its balance.

And, the structures of the present invention as shown in Fig. 8 and Fig. 9 are available. They are as follows.

The cylinder (4) can also compose a transparent cap (4a) and a cover (3a) separately. At the bottom of the cover (3a), there is a cap hole (10) fitting outer circumference of the transparent cap (4a). As for the structure of the present invention, the one is that the cover (3a) is connected to the container body (2) by the linkage (11) (12) (13) (14), and the other is that the cover (3a) is connected to the transparent

cap (4a) by the linkage (15) (16). It can be selected the structure either.

First Embodiment

5 The first embodiment of the airtight container of the present invention will be described with reference to Fig. 1 - Fig. 4.

Fig.1 is a perspective view showing an airtight container of the present invention.

Fig.2 is an enlarged perspective view showing a screw cap.

10 Fig. 3 is a schematic illustration showing the condition that the grains settle in the liquid.

Fig. 4 is a schematic illustration showing a confirmation zone (5) under the condition to shown in Fig.3 by seeing from the bottom.

15 Reference numeral (1) denotes an airtight container of the present invention, (2) denotes a container body, (3) denotes a screw cap, (4) denotes a cylinder, (5) denotes a confirmation zone, (6) denotes a neck of the container, (7) denotes a support settlement, (8) denotes the grains, (9) denotes the liquid.

20 As shown in Fig.1, an airtight container (1) of this embodiment consists of a container body (2) formed rectangular parallelepiped and a screw cap (3) which is wholly transparent. An external thread is molded on the neck outward of the container body (2). The screw cap has a cylinder (4) in the center of the cap inward. The cylinder has an internal thread fitting the external screw. And the cylinder (4) can be supported by the four support settlements (7) inside the cap (3) as shown in Fig.2.
25 And it is also available that only the confirmation zone (5) is made transparent.

30 The airtight container (1) of this embodiment has the height of the cap 30mm in the entire length 140mm, and one side 55mm square. And the container becomes stable by making the length of one side of the cap the same as the above length of one side of the container, though the cap is put downward. And when a container body is made cylindrical, a cap has the same diameter as the container body.

35 The container body is formed by polyethylene, and the cap is formed by polystyrene. And the material of the screw cap is harder than the material of the container body. And the present invention can be used other materials in addition to the above materials, if they can keep at least a characteristic of the present invention.

Furthermore, a diameter of the neck (6) of the container and the cylinder (4) of the cap are not limited to the illustrated, and it is available to make their diameters larger than these. The whole size isn't limited to the above either.

5 It finally screws up when the tip of the container neck part reaches the bottom of the cap. The mixed condition of the contents can be seen through the confirmation zone (5) from the outside.

When the contents consist of the grains (8) and the liquid (9), the grains (8) settle in the container as shown in Fig. 3. And the grains
10 (8) settled in the bottom touch the inside of the cap of the confirmation zone (5) directly, and such a condition of the contents can be seen from a direction of an arrow as shown in Fig.3 (Fig. 4). Then the users make the contents mix by shaking the container (1) before using, and can confirm that they are fully mixed, and there is no precipitate through
15 the confirmation zone (5), and then they can use the contents.

According to the airtight container of the present invention, the mixed condition of the contents can be confirmed with the eyes of the users directly, without opening the cap. As for this embodiment, even if the contents consist of the grains and the liquid, and the grains
20 settle in the bottom, the contents are never used without mixing fully. And the users do not need to shake the container excessively. It is very useful.

Second Embodiment

25 The second embodiment of the present invention will be described with reference to Figure 5 - Figure 7.

Fig. 5 is a schematic illustration showing an airtight container according to the second embodiment.

Fig. 6 is a schematic illustration showing the condition that the
30 grains settle in the liquid.

Fig. 7 is a schematic illustration showing the bottom of the screw cap under the condition to shown in Fig. 6.

And, the numbers in the figures point at the object, which is the same as the first embodiment.

35 An airtight container of this second embodiment shows another variation of the present invention. The present invention of the second embodiment has the same construction as the first embodiment except for

the shape of the container and the screw cap. As for this embodiment, a container body and a screw cap are made cylindrical. The mixed condition of the contents can be seen more easily because it has a large opening of the diameter, which is about the same as the container body.

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Third Embodiment

The third embodiment of the present invention will be described with reference to Fig. 8.

Fig. 8 is a schematic illustration showing an airtight container of the third embodiment. On the figure at the bottom of Fig. 8, a container neck, an external thread and an internal thread are omitted. Reference numeral (3a) denotes a cover, (4a) denotes a transparent cap, (10) denotes a cap hole, (11) (13) denote convex parts, (12) (14) denote concave parts. Other numbers point at the objects, which are the same as the above embodiments.

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Though the cylinder (4) and the screw cap (3) are molded in one body as for the first embodiment, a transparent cap (4a) instead of the cylinder (4) is constructed separately from the cover (3a) in this third embodiment. And the cap hole (10) fitting for the diameter of the transparent cap (4a) is made at the bottom of the cover (3a). And, there are the linkages on the cover (3a) and the container body (2) so that they are connected with each other.

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A transparent cap (4a) is put in the container neck, and the cover (3a) is put in the container body (2). At that time, the convex parts (11) of the cover are put in the concave parts (14) of the container (2) downward. The concave parts (12) of the cover are put in the convex parts (13) of the container (2) downward at a time.

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The figure at the bottom of Fig. 8 is the sectional schematic view, which shows the condition that the cover (3a), the container body (2) and the transparent cap (4a) are held exactly. It is constructed that the extreme bottom of the transparent cap (4a) and the bottom of the cover (3a) to become plane.

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The linkages (11) (12) (13) (14) are not limited as shown in the upper and the middle figure in Fig. 8. It is allowed to mold them to the peripheral part of the container body which the cover connects with.

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The mixed condition of the contents can be also seen directly, and can be confirmed without opening the cover and the transparent cap by

the structure of this embodiment. Furthermore, the cover connects to the transparent cap firmly by such linkages, and it is suitable for putting the cap downward.

5 Fourth Embodiment

The fourth embodiment of the present invention will be described with reference to Fig.9.

Fig. 9 is a schematic illustration showing an airtight container of the forth embodiment. And, as for the figure at the bottom of Fig.9, a container neck, an external thread, and an internal thread are omitted because the figure is just the schematic illustration showing connecting condition between a cover (3a) and a transparent cap (4a). Reference numeral (15) denotes a convex part, (16) denotes a concave part. Other numbers point at the objects, which are as the same as the above
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15 embodiments.

This embodiment is related to another variation of the above third embodiment. The cap hole (10) of the cover is made to have height as shown in the figure of the middle of Fig.9. Four convex parts (15) are set the inside wall of this cap hole (10), and Four concave parts (16) are set on the transparent cap (4a) in accordance with the convex parts (15) as shown in the upper figure of Fig.9.
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In this embodiment, it is constructed that the extreme bottom of the transparent cap (4a) and the bottom of the cover (3a) to become plane as shown in the bottom figure of Fig.9.

As for the structure of this embodiment, the mixed condition of the contents can be also seen directly, and it can be confirmed without opening the cover and the transparent cap. Furthermore, the cover connects to the transparent cap firmly by the linkages, it is suitable for putting the cap downward.
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Although the present invention has been fully described in connection with the preferred embodiments thereof with reference to the accompanying drawings, it is to be noted that various changes and modifications are apparent to those skilled in the art. Such changes and modifications are to be understood as included within the scope of the present invention as defined by the appended claims unless they
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35 depart therefrom.

INDUSTRIAL APPLICATION

According to the present invention, as described above, the mixed condition of the contents can be seen directly from the outside with the cap closed even if it is necessary to keep the contents out of the light because of the character of the contents and the container body should be made un-transparent.

Therefore, contents are used by watching them mixed fully through the transparent zone. Moreover, it is very convenient for the users not to shake the airtight container too much.

Regarding as the contents of the present invention, they are not limited to the contents mentioned in the above embodiments. For example, two kinds of liquid which specific gravity is different from each other, and can be also distinguished by their colors, are available. And if the mixture is at least different by one of the factors that are grain diameter, grain shape, color, the specific gravity, and it can be seen the mixed condition with the eyes, it can get the same effect as the above embodiments.

What is claimed is:

1. An airtight container which can be seen the mixed condition of the contents with a screw cap closed, and nomally put with said cap side downward, as keeping its balance, the container comprising:
 - a) a container body has a neck molded an external thread on it;
 - b) said cap has a cylinder molded an internal thread in it;
 - c) said cap has an only transparent zone where an opening part of said container body touches;
 - d) said cap has the same diameter as said container body;
 - e) said container body is made by un-transparent material; and
 - f) said container body and said cap are made of synthetic resin, and the material of said cap is harder than the material of said container body.

2. An airtight container which has the linkage between a cover and a container body so that they are connected with each other, the container comprising:
 - a) a container body;
 - b) a transparent cap having an internal thread for an external thread molded on the neck of said container body; and
 - c) a cover having a cap hole at the bottom, fit for the diameter of said transparent cap.