



ACTION

SPECIFICATION



159159

Container capable of maintaining its compressed state in a longitudinal direction and compression method thereof

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a container for juice or mineral water produced by a blow molding method or the like, in particular an improvement of a container capable of being compressed in a longitudinal direction (being reduced in volume) after drinking up its content.

DESCRIPTION OF THE RELATED ART

Sales of synthetic resin containers have been increasing considerably in recent years. However, when juice or mineral water in the body of a container is drunk and the container is thrown away, the shape of the container body remains the same, and in case of throwing such a container away in a trash can, the trash can looks as if air is dumped in it. The trash can will be undesirably fulfilled soon, and in the end, such containers will be thrown away out of the trash can, which might deteriorate our life environment, and in addition, the cost of collecting drained containers and the labor cost for cleaning are problematic in public services.



G00001

Also, this kind of synthetic resin container can be manufactured by a simple means such as blow molding, but on the contrary, the strength of the container could not yet be said satisfactory for transportation by vehicle which is accompanied by violent vibration or for stacked display in stores.

Furthermore, when containers are transported from a container manufacturer to a bottler of juice or mineral water, the containers take up much space, which results in increasing the cost of transportation.

SUMMARY OF THE INVENTION

It is an object of the present invention to make it possible to reduce extremely the volume of a container body remarkably, when juice or mineral water in the container body is drained and the container body is thrown away, and to increase the number of the container to be thrown in a trash can.

At the same time, that makes it possible to transport a large number of empty container bodies at a time, so it is also an object of the present invention to make it possible to reduce the collection cost and the labor cost thereof.

It is also an object of the present invention to increase a quantity of container per transportation from a container manufacturer to a bottler of juice or mineral water.

Furthermore, the object of the present invention is to make it possible to maintain a compressed shape of a container body without providing the container body with a restoring force after the volume of the container body is reduced.

It should be appreciated that the entire shape of the container body of the present invention is selected from a circular cylinder including an ellipse, a rectangular column, a circular cone and a pyramid, and the horizontal cross sectional shape of the container is selected from a circle including an ellipse and a rectangle.

Another object of the present invention is to make it possible to enlarge the surface area of the container, compared to a conventional one, on which a label showing contents, a trademark or the like is fixed or on which its contents or a trademark is directly printed.

Also, it should be appreciated that the container body of the present invention has a good appearance, can be prevented from falling when being used, can prevent its contents from spilling out, and can maintain a compressed state in its longitudinal direction, and a compression method thereof is provided.

The present invention is characterized by that a force in one direction acts on a piece of folds constituting an accordion-shaped portion of a container body and/or a part of

its inner periphery, while a force in the opposite direction acts on its outer periphery, when a force from the substantially right-angle direction thereof is applied to the accordion shape, thereby a compressed state of the container body in a longitudinal direction is maintained.

Furthermore, the present invention is characterized by that the accordion-shaped portion of the container body has one diameter thereof smaller than the other diameter.

Still further, the present invention is characterized by that the accordion-shaped portion of the container body has one diameter smaller than the other diameter, and equal to a lower diameter, by increasing gradually as it approaches the other.

Still further, the present invention is characterized by a compression method of a container capable of maintaining a compressed state in a longitudinal direction wherein a force in one direction acts on a piece of folds constituting the accordion shape and/or a part of inner periphery, while a force in the opposite direction acts on the outer periphery thereof, when a force from a substantially right-angle direction thereof is applied to the accordion-shaped portion of said container body, thereby a compressed state in a longitudinal direction is maintained.

Still further, the present invention is characterized by that the entire shape of the container body is selected from

a circular cylinder including an ellipse, a rectangular column, a circular cone and a pyramid, an hourglass shaped drum, and a barrel shaped drum.

Still further, the present invention is characterized by that the horizontal cross sectional shape of the container body is selected from a circle including an ellipse, and a rectangle.

Still further, the present invention is characterized by that a label showing contents, trademark or the like is fixed on the external periphery of the container body.

Still further, the present invention is characterized by the one comprising a container body provided with a tap portion projecting upward from the middle portion at the top end, and horizontal accordion shape formed on the inner and outer wall of the container body, over the whole length in the longitudinal (height) direction or a part thereof, except the tap portion, wherein the accordion-shaped portion of the body has an upper diameter thereof smaller than the lower diameter, and increasing gradually as it goes downward; a force acts downwards in the inner diameter direction of the folds of accordion shape of the upper part, and downwards in the outer diameter direction, when the force from a substantially right-angle direction is applied to the accordion-shaped portion of said container body; and the force acts upwards in the inner diameter direction of the

fold of accordion shape of the lower part, and upwards and downwards in the outer diameter direction, for maintaining a accordion shape where the length (height) of said container body is compressed.

It should be appreciated that for the container body of the present invention, in case of carrying or holding it after having drained a part of, for example, juice, the container body can be compressed by the amount of drained quantity thereof; therefore, the present invention is also characterized by that its volume to be carried or held can be reduced as much.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a container body which is one embodiment of the present invention.

Fig. 2 is a partially cutout longitudinal sectional view of a state where the container body is collapsed.

Fig. 3 is a circular cylinder cross sectional view of another embodiment.

Fig. 4 is an ellipse cross sectional view of another embodiment.

Fig. 5 is a rectangle cross sectional view of another embodiment.

Fig. 6 is a polygon cross sectional view of another embodiment.

Fig. 7 is an hourglass shaped drum perspective view of another embodiment.

Fig. 8 is a perspective view of the same to which labels are fixed.

DESCRIPTION OF CHARACTERS

- 1 Body of container
- 2 Accordion-shaped portion
- 3 Tap portion
- 4 Curved portion
- 5 Label
- 6 Fold of the first stage
- 7 Fold of the second stage
- 8 Fold of the third stage
- 9 Fold of the fourth stage
- d Outer diameter
- d1 Diameter of the first stage
- d2 Diameter of the second stage
- d3 Diameter of the third stage
- f Pushing down force
- f1 Inside periphery of fold (6)
- f2 Outside periphery of fold (6)

f3 Pushing up force

DETAILED DESCRIPTION OF THE PRESENT INVENTION

An embodiment of the present invention shown in the attached drawings will be described.

(1) is a container body, and the outer and inner peripheries in the height (length) direction thereof have an accordion shape (2). There, though the illustrated container has an accordion shape all over the height direction, the middle or the end portion thereof can be made flat, to indicate the commercial mark of product contents thereon.

Fig. 2 shows a state where mineral water sealed in the aforementioned container body (1) is drained up and the same is collapsed in the height (length) direction from one or both sides thereof. Namely, the container body (1) of the present invention has an excellent configuration and deploys an excellent function.

Also, in Fig. 2, (3) is a tap portion of the container body (1), a directly lower part thereof has a curved portion shape (4), and the diameter of the second stage (namely, the uppermost stage of the aforementioned accordion-shaped portion (2)) (d1) is made smaller than the outer diameter (d) of the container body (1). Then, the diameter (d2) of the accordion shape (2) of the second stage in respect to the

accordion shape of the first stage, is larger than the aforementioned diameter (d1) of the first stage and smaller than the outer diameter (d) of the container body (1).

Further, the side view is stepped in order to form a diameter (d3) of the third stage continuous to this, larger than the aforementioned outer diameter (d2) of the second stage; however, the number of stage is of course not limited to three (3) but a plurality of stages may be adopted.

It should be appreciated that the cross sectional shape of the container body (1) is not limited to a circle as in Fig. 2, but it may be elliptical as in Fig. 3, Fig. 4 or a cone as in Fig. 5, Fig. 6. Also, the height (length) direction shape may be, in addition to a circular cylinder as in Fig. 1, an hourglass shaped drum, or a barrel-shaped drum though not illustrated herein.

Moreover, in this Fig. 8, (5) is a label fixed around one or both of the upper part or lower part of the container body (1), made of a thin synthetic resin film and showing a trademark for the product or a specification of contents and, in this case, it should be collapsible together with the container body (1) without resistance when the contents of the container body (1) is drained up and the container body (1) is collapsed.

Thus, the container body (1) is manufactured by a blow molding means and is transported to a bottling factory of,

for example, mineral water. In this case, a large quantity of container bodies (1) can be transported at a time by reducing the height (length) of the container body (1) by a certain means as shown in Fig. 2, and be expanded again in the bottling factory of mineral water.

However, ordinarily, in most of the bottling operations of mineral water or juice, material flows in the form of pipe through an extruder from a powder resin material, the container body (1) is molded by an automatic molder called a rotary machine, filled with mineral water automatically, capped and labeled in a series of continuous operations.

Now, suppose all juice in the container body (1) is drained up. Here, the tap portion (3) is pushed down by a relatively strong force (f). This force (f) pushes down the periphery (f1) inside a fold (6) of the first stage of the accordion shape through the inside of a curved portion (4). As the result, an outside periphery (f2) of the fold (6) is raised upward. Thus, several stages (three stages for the illustrated example) of the accordion shape (2) performs such a function; however, in case of this embodiment, the upper part of the accordion-shaped portion (2) forms a curved portion (4), the diameter (d1) of the fold (6) of the first stage is smaller than a fold (7) of the second stage, the outer diameter (d3) of a fold (8) of the third stage is larger the outer diameter (d2) of this fold (7) of the second

stage, and the outer diameter (d3) is equal to the outer diameter (d) of the container body (1), therefore, the force of the aforementioned tap portion (3) is transformed into a force pushing up the inside and pushing down the outside, at a fold (9) of the fourth stage in the drawing.

As the result, the accordion-shaped portion (2) of the container body (1) is shaped en [>] at the curved portion (4) over it and at the portion under it, the force (f1) pushing down the inside of folds (6) to (8) the curved portion (4) and a force (f3) pushing up the fold (9) inside are balanced, and at the same time, a force (f4) pushing down the outside of the folds (6) to (8) the curved portion (4) is balanced and this force prevents impedes a force (righting moment) restoring the container body (1) to its original shape, and the container body (1) maintains this collapsed state.

As the result, in repeated experiments, the height (volume) of container body (1) was compressed to 1/3 to 1/4 or lesser, and the space necessary in a trash can or the like for dumping it can be reduced by far.

A main effect of the present invention mentioned above is that the volume of the container body was made able to be reduced by far, and the number thereof to be contained in a trash can or other was increased by far.

In addition, as such a compressed container body can be transported in quantity at the same time, the collection cost

thereof, and the labor cost for cleaning and collection could be reduced considerably.

The container body of the present invention has a good looking external shape, arouses a strong interest of the user, the accordion shape of the container body becomes a friction stop, preventing the container body from slipping and falling during the used, and the contents flow overflowing before occurrence.

Besides, even the shape of the container body collapsed according to the present invention looks good in respect of design and can be used as outer container as it is.

WHAT IS CLAIMED IS:

1. A container capable of maintaining a compressed state in a longitudinal direction comprising a container body of which whole length in the longitudinal direction or a part thereof is formed into a horizontal accordion shape except a tap portion, wherein, when a force from a substantially right-angle direction thereof is applied to the accordion-shaped portion of said container body, a force in one direction acts on one of folds constituting the accordion shape and/or a part of inner periphery, while a force in the opposite direction acts on an outer periphery thereof, thereby a compressed state in a longitudinal direction is maintained.
2. The container capable of maintaining a folded state of claim 1, wherein the shape of the accordion-shaped portion of the container body is formed such that a diameter at one side is made smaller than that at the other side.
3. The container capable of maintaining a folded state of claim 1, wherein the shape of the accordion-shaped portion of the container body is formed such that a diameter at one side smaller than that at the other side, and is gradually increased forwards to be made equal to a lower diameter approaches the other.
4. A compression method for compressing a container capable of maintaining a compressed state in a longitudinal direction comprising a container body of which whole length in the

longitudinal direction or a part thereof is formed into horizontal accordion shape except the tap portion, wherein a force in one direction acts on a piece of folds constituting the accordion shape and/or a part of inner periphery, while, when a force from a substantially right-angle direction thereof is applied to the accordion-shaped portion of said container body, a force in the opposite direction acts on an outer periphery thereof, thereby a compressed state in a longitudinal direction is maintained.

5. The container capable of maintaining a compressed state in a longitudinal direction and the compressing method thereof according to one of claims 1 to 4, wherein the entire shape of the container body is selected from a circular cylinder including an ellipse, a rectangular column, a circular cone and a pyramid, an hourglass shaped drum, and a barrel shaped drum.

6. The container capable of maintaining a compressed state in a longitudinal direction and the compressing method thereof according to one of claims 1 to 5, wherein the horizontal cross sectional shape of the container body is selected from circular including elliptical, and square including rectangular.

7. The container capable of maintaining a compressed state in a longitudinal direction and the compressing method thereof according to one of claims 1 to 6, wherein a label

where guidance or commercial mark of contents of the container are printed is put around the external periphery of the container body.

8. A container capable of maintaining a compressed state in a longitudinal direction, comprising:

a container body provided with a tap portion projecting upward from the middle portion at the top end, and

horizontal accordion shape formed on the inner and outer wall of the container body, over the whole length in the longitudinal (height) direction or a part thereof, except the tap portion, wherein

the accordion-shaped portion of the body has an upper diameter thereof smaller than the lower diameter, and increasing gradually as it goes downward;

a force acts downwards in the inner diameter direction of the folds of accordion shape of the upper part, and downwards in the outer diameter direction, when the force from a substantially right-angle direction is applied to the accordion-shaped portion of said container body;

the force acts upwards in the inner diameter direction of the folds of accordion shape of the lower part, and upwards and downwards in the outer diameter direction; and

an accordion shape where the length (height) of said container body is compressed is configured to be maintained.