OVAL CONTAINER

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ABSTRACT

An oval plastic container. A cross-section of the container, taken perpendicular to the height of the container shows an oval or elliptical shape. Such a container has front and back sides. The container also has a left side and a right side. Given the oval shape of the body, the width of the container as measured from the left side to the right side, is less than the depth of the container, measured from front to back. The front and back of the container therefore have a relatively small radius of curvature, compared to the left and right sides. The front and/or the back of the container includes a relatively featureless panel. Such a panel is flat, apart from the curvature that results from the oval shape of the body. Such an area can be used for the application of a pressure-sensitive label. The oval shape of the body prevents the labeled surface from buckling during the cooling process. The left and right sides of the container may include structure such as ribbing, to prevent buckling or excessive deformation during cooling. Alternatively, the left and right sides of the container may include vacuum panels that may be drawn inward during cooling, without excessive deformation or buckling.
OVAL CONTAINER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention described herein relates to plastic containers, and relates in particular to the shape and structure of such containers.

2. Related Art

As is widely known, it is common for beverages to be sold in plastic containers. Such containers can be single-serving or multi-serving containers. Moreover, certain beverages are commonly placed into the containers when the beverage is still hot. Some manufacturers of fruit juices and teas fill their product when the beverage is approximately 185°F, for example. The bottles are then immediately capped and cooled, which creates an internal vacuum. The container design should withstand or allow for this internal vacuum "take-up" while maintaining the desired look of the design. Containers that can accommodate a hot liquid product in this manner are known as hot-fillable.

Given that such beverages are intended for consumer purchase, the containers must typically be labeled. One method of labeling involves the application of a pressure-sensitive label. Ideally, such a label is placed on a smooth portion of the container. This allows the entire area of the label to be in contact with the container surface. Placement of a pressure-sensitive label on a portion of the container that has any sort of surface geometry may not be aesthetically pleasing. Moreover, a pressure-sensitive label may not adhere well to such a surface. For these reasons, a relatively smooth surface is preferred for labeling purposes.

The presence of a smooth surface may create other problems, however. After a plastic container is hot-filled and capped, the container is cooled to room temperature. During the cooling process, the volume inside the container necessarily contracts and creates an internal vacuum. If the container has a flat surface, the container may bend or buckle inward at that point. Such deformation can be prevented by including geometric features into the container to increase rigidity. The use of ribs, for example, can provide the necessary structure to prevent the container from buckling during the cooling process. But, as described above, the presence of such geometry makes the use of pressure-sensitive labels problematic.

What is needed, therefore, is a plastic container design, such that sufficient structure is present to prevent buckling of the container during the cooling process, while providing a relatively smooth or flat surface to which a label can be applied.

BRIEF SUMMARY OF THE INVENTION

The invention described herein is an oval plastic container. A cross-section of the container taken perpendicular to the height of the container shows an oval or elliptical shape. Such a container has front and back sides. The container also has a left side and a right side. Given the oval shape of the body, the width of the container as measured from the left side to the right side, is less than the depth of the container, measured from front to back. The front and back of the container therefore have a relatively small radius of curvature, compared to the left and right sides. The front and/or the back of the container includes a relatively featureless panel. Such a panel is smooth and flat, apart from the curvature that results from the oval shape of the body. Such an panel can be used for the application of a label. The oval shape of the body prevents the front and back surface from buckling during the cooling process. The left and right sides of the container may include structure such as ribbing, to prevent buckling or excessive deformation during cooling. Alternatively, the left and right sides of the container may include vacuum panels that may be drawn inward slightly during cooling, without excessive deformation.

Further objectives and advantages of the invention as well as preferred embodiments, will become apparent from consideration of the description, drawings, and examples provided herewith.

BRIEF DESCRIPTION OF THE FIGURES

Fig. 1 is an illustration of an oval plastic container, according to an embodiment of the invention.

Fig. 2 illustrates the container of Fig. 1, as viewed from the front or back.

Fig. 3 illustrates the container of Fig. 1, as viewed from the side.

DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the invention are discussed in detail below. In describing embodiments, specific terminology is employed for the sake of clarity. The invention is not intended to be limited to the specific terminology so-selected. While specific exemplary embodiments are discussed, it should be understood that this is done for illustration purposes only. A person skilled in the relevant art will recognize that other components and configurations can be used without departing from the spirit and scope of the invention.

The invention described herein is an oval plastic container. A cross-section of the container, taken perpendicular to the height of the container shows an oval or elliptical shape. Such a container has front and back sides. The container also has a left side and a right side. Given the oval shape of the body, the width of the container as measured from the left side to the right side, is less than the depth of the container, measured from front to back. The front and back of the container therefore have a relatively small radius of curvature, compared to the left and right sides. The front and/or the back of the container includes a relatively featureless panel. Such a panel is smooth and flat, apart from the curvature that results from the oval shape of the body. Such an panel can be used for the application of a label and is therefore referred to herein as a label placement surface. The oval shape of the body prevents the front and back from buckling during the cooling process. The left and right sides
of the container may include structure such as ribbing, to prevent buckling or excessive deformation during cooling. Alternatively, the left and right sides of the container may include vacuum panels that may be drawn inward during cooling, without excessive deformation or buckling.

One embodiment of an oval container is illustrated in FIG. 1. Such a container can be fabricated using polyethylene terephthalate (PET), or a similar compound. The illustrated container 100 includes a neck 110. In an embodiment of the invention, neck 110 is essentially cylindrical. At one end of the neck 110 is a finish 120. At the opposite end of the neck 110 is a shoulder 130. Shoulder 130 has a top end 127 and a lower end 133. Adjacent to the lower end 133 of shoulder 130 is a body 140. The front area of container 100 is shown as front area 150. The back of container 100 is not visible. The cross section of body 140, taken perpendicular to the height of bottle 100, is essentially oval in shape. In embodiments where the neck 110 is essentially cylindrical, the top end 127 of neck 110 is essentially circular in cross section, while the lower end 133 is essentially oval in cross section. Also shown is a base 170, adjacent to the body 140. Note that, because of the oval shape of the body 140, base 170 also has an essentially oval cross-section.

Front area 150 is flat, apart from the curvature that results from the oval shape of the body 140, and is essentially smooth. Front panel 150 can therefore represent a label placement surface. A corresponding back panel (not shown) may also be essentially smooth and can also represent a label placement surface. A side panel 160 is also shown. In the illustrated embodiment, a vacuum panel is shown as part of side panel 160. This panel allows the cooling process to take place without creating excessive deformation of container 100. During the cooling process, the vacuum panel will be drawn in to some extent as a result of the attendant decrease in volume during cooling.

In an embodiment of the invention, neck 110 is a so-called “long neck.” In the illustrated embodiment, neck 110 is approximately half the height of body 140.

FIG. 2 shows a view 200 of the container of FIG. 1. Again, neck 110 is shown having finish 120 at one end and shoulder 130 at the other end. In this view, the front of oval body 140 is shown. Note that the front area 150 is essentially featureless and can be used as a label placement surface. No geometry is present in the illustrated embodiment, apart from the curvature that results from the oval shape of the body 140. The width of the container, as measured from the left side to the right side, is indicated as w.

FIG. 3 presents side view 300 of container 100. The body 140 includes front area 150, along with side area 160. Side area 160 includes a vacuum panel in the illustrated embodiment, as discussed above with respect to FIG. 1. The depth of the container as measured from front to back is shown as d. As can be seen in FIGS. 2 and 3, d=w. In other words, given the oval shape of the body 140, the depth d of the body as measured from front to back exceeds the width w of the body 140 as measured from side to side. In the illustrated embodiment, side area 160 is essentially featureless; in alternative embodiments of the invention, surface geometry may be present. Examples of such geometry include finger grips, or one or more horizontal ribs running across the side area.

Given the oval shape of the container, the front and back are relatively resistant to deformation during the cooling process. The front and back have a relatively small radius of curvature as viewed in cross section. Unlike a broader, flatter surface, the front and back surfaces tend to resist buckling. This therefore helps to maintain the integrity of the container during cooling, and allows the placement of a label on the front or back.

The embodiments illustrated and discussed in this specification are intended only to teach those skilled in the art the best way known to the inventors to make and use the invention. Nothing in this specification should be considered as limiting the scope of the present invention. All examples presented are representative and not limiting. The above-described embodiments of the invention may be modified or varied, without departing from the invention, as appreciated by those skilled in the art in light of the above teachings. It is therefore to be understood that, within the scope of the claims and their equivalents, the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A hot-fillable blow-molded container, comprising:
   a neck having a finish at one end;
   a shoulder having a top end and a lower end, such that the top end of the shoulder is adjacent to the neck at an end of the neck opposite the finish;
   a body adjacent to the lower end of the shoulder, the body having an essentially oval shaped cross section, where the cross section is taken perpendicular to the height of the container, the body having a front, a back, a left side and a right side wherein the width of the body, as measured from the left side to the right side, is less than the depth of the body as measured from the front to the back;
   a base adjacent to the body and located at an end of the body opposite the shoulder;
   a vacuum relief panel located in at least one of the left and right sides of the body,
   wherein at least one of the front and back of the body is essentially devoid of surface geometry other than curvature due to the oval shape of the body.

2. The container of claim 1, wherein the oval shape of the cross section applies to substantially the entire body.

3. The container of claim 1, wherein the at least one of the front and back sides of the body that is essentially devoid of surface geometry other than curvature due to the oval shape of the body provides a label placement surface, and
   the label placement surface provides a surface for supporting a label such that substantially all of the label is in contact with the label placement surface.

4. The container of claim 1, wherein both the front and back sides of the body are essentially devoid of surface geometry other than curvature due to the oval shape of the cross section.

5. The container of claim 1, wherein the vacuum relief panel is recessed into the at least one of the left and right sides of the body.

6. The container of claim 1, wherein the neck is approximately half the height of the body.
7. The container of claim 1, wherein the plastic material comprises polyethylene terephthalate.

8. The container of claim 1, wherein the vacuum relief panel is devoid of surface geometry other than curvature due to the oval shape of the cross section.

9. The container of claim 1, wherein a top end of the shoulder has a round cross section and a lower end of the shoulder has an oval cross section.