

Description

This invention relates to thermoplastics containers having a body with a standing base, the base being formed with a central recess and having a standing ring with a crest which defines the periphery of the recess, for controlling distortion of the base against internal pressure of the container, the container further including a ring member which receives the crest of the standing ring in generally nested relation. The invention has particular, but not exclusive, application to screw-top bottles for carbonated beverages. Such a container is known from GB-A-1501662.

It is well known to make carbonated beverage bottles from thermoplastics polymers, in particular polyethylene terephthalate (PET), by a blow moulding operation performed on an extruded tubular parison or an injection moulded preform. Carbonated beverages, e.g. beer, can generate in the bottles internal pressures of several atmospheres in magnitude, and in order to withstand such pressures without eversion or other uncontrolled deformation it has been proposed that the bases of the bottles should be outwardly (i.e. convexly) domed to rounded or generally hemispherical form.

In order to enable the bottles to be stood upright it has further been proposed that either the bottle bases should be modified by the superposition of integral standing feet on the outside of the generally rounded base contour, or the bottles should be fitted with separate standing cups providing annular standing surfaces extending around, and proud of, the bottle bases.

However, each of these expedients has disadvantages. For both expedients the rounded standing bases represent a substantial height (axially of the bottle), so correspondingly reducing the area available for printing or labelling. The provision of integral standing feet requires exacting design and close control of the moulding operation if satisfactory bottles are to be produced at high speed and over long production runs. Furthermore, the standing feet themselves represent a substantial additional requirement for the thermoplastics material, which is likely to be relatively expensive to provide the low gas permeability required for the bottle; moreover, the feet are visible from the side of the bottle and are visually unattractive, and when the bottles are passing at high speed along a filling line they tend to catch in irregularities, joints, etc., of the conveyor so that, in these circumstances at least, the stability which they impart to the bottles is unsatisfactory.

A standing cup may be made from a thermoplastics material which is cheap in relation to that of the bottle proper, but the difference in materials then creates a separation problem if the materials are to be recycled after the bottle has been used. Moreover, the rounded base of the bottle is unsightly, and for visual appeal, maximum stability and/or ease of attachment and location, the cup conventionally has an upturned

cylindrical skirt which extends, in generally flush relation to the bottle body, for the whole height of the base. The skirt is therefore extensive in area, and correspondingly has a substantial material requirement; the relative cheapness of the cup material in relation to that of the body therefore does not result in any substantial economies. A further disadvantage of the standing cups now employed is that they tend to give the purchaser of the bottles a greater impression of the quantity of product than in fact exists, so leading to a degree of consumer resistance.

A further base arrangement for a carbonated beverage bottle is disclosed in US-A-4108324. In that specification there is described a one-piece thermoplastics bottle of which the base is recessed within an annular standing ring. In order to rigidify and stabilise the base against eversion and "rolling-out", hollow, shallow projections are formed at regular intervals around the wall of the recess and extend radially inwardly towards the centre of the base. This configuration suffers from the same or similar disadvantages as the rounded base configuration of the one-piece bottle described above except that the appearance of the bottle is improved; moreover, the recessed base configuration is inherently less able to withstand carbonation pressures than the rounded base configuration, and despite the rigidifying projections the material thickness of the base may need to be made correspondingly greater than before the same carbonated pressure, with concomitantly increased material costs.

In the above-mentioned GB-A-1501662 is described a bottle which has, either secured thereto, or embedded therein, a metallic reinforcing piece intended to restrain the bottom of the bottle against deformation due to internal pressure. One suggestion for the reinforcing piece is that it may have the form of a curved ring conformed to the contour of the bottom of the bottle, and it is proposed to fasten the reinforcing piece by mechanical engagement, e.g. a bead on the reinforcing piece held in a circumferential groove in the body of the bottle, or by gluing over the whole contact area of the reinforcing piece with the body. This prior art arrangement requires the reinforcing piece to be metallic with higher strength properties than the material of the bottle, yet a reinforcing piece made of metal poses the problems that it is obtrusive and therefore unattractive to a potential customer, that it increases the weight of the bottle substantially when the main advantage of plastics over glass bottles is the weight reduction, and that it is not easy to manufacture a bottle to which the reinforcing piece is reliably secured.

The invention as claimed is intended to remedy these drawbacks and to provide further advantages. It solves the problem of how to provide a thermoplastics container which is protected against undue distortion caused by internal pressure. The container combines the properties of maximum strength to weight ratio preferably afforded by a biaxially oriented body, with the

ability to stand on a standing ring protected against undue distortion by a ring member precisely located where it is most required, so that the container performs to acceptable standards of drop and impact, creep performance at high temperatures, stability under pressure and recyclability. Furthermore, the container appears to the customer to be one piece after manufacture and has no obtrusive base cup.

Accordingly, the present invention is characterised in that the ring member is of a thermoplastic polymer which is mutually weldable with that of the base, and in that the ring member is welded to the base radially outwardly of the crest but radially inwardly of the crest is free of the base so that the base is movable relative thereto, whereby, radially inwardly of the crest, the base is spaced from the ring member when the container is unpressurised, but moves into abutment with the ring member and is thereby supported against further distortion when the container is pressurised.

The ring member is thus made not of metal but of a thermoplastic polymer which is mutually weldable with that of the container body. GB-A-1501662 teaches away from the use of thermoplastics for the standing ring, by requiring that the reinforcing piece should have higher strength properties than the plastics material of the bottle. In the present invention, the ring member is attached to the container body by welding, thus ensuring the required strength while retaining component cost viability and visual appearance. The welding operation is suitably spin-welding.

The ring member is secured outwardly of the crest of the standing ring, where the bond is substantially in shear, thus minimising the likelihood of separation of the ring member from the body. Internal pressure will force the container base into contact with the ring member just at the time when strengthening by the ring member is most required. Yet it is advantageous that the base is spaced from the ring member when the container is unpressurised, since contact between the two components at only one point during spin-welding ensures that dissipation of the welding energy can be controlled, resulting in a successful weld.

In a particular embodiment of the invention, the standing ring has a substantially frustoconical inner wall and an upwardly and outwardly tapering substantially frustoconical outer wall to which the ring member is welded, the location of the weld being such that forces which it is required to withstand and which are generated by internal pressures of the container are largely in shear. Within the recess the ring member provides a continuous path in which hoop stresses can be generated to restrain the eversion forces in that locality.

It should be understood that the terms inner (inwardly) and outer (outwardly), as used throughout the specification, have the intended meaning of radially inner and radially outer.

In order that the invention may be more fully understood embodiments thereof will now be described, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 shows a first polyethylene terephthalate (PET) bottle in accordance with the invention, as it is before filling with a carbonated beverage product and closing with a screw cap;

Figure 2 is an enlarged view of the bottom part of the bottle as seen in diametral section on the line II—II of Figure 1 after the bottle has been filled and closed;

Figures 3A and 3B are enlarged scrap views of the heel area of the bottle, respectively showing the relation of the bottle body and the ring member before and after pressurisation;

Figure 4 shows the bottle in underplan view;

Figure 5 is a view corresponding to Figure 3B of a second embodiment of the invention; and

Figure 6 shows the ring member of a third embodiment of the invention as seen on a section taken adjacent one of the strengthening ribs thereof.

Referring firstly to Figure 1, there is shown a bottle for carbonated beverages such as mixers for alcoholic drinks. The bottle has a body 10 which is integrally formed with a generally cylindrical side wall 11, a neck 12 with a screw thread 13 and gripping ring 40, and a base 14 (only partly visible in Figure 1) by means of which the bottle may be stood upright when desired. For use, the bottle is filled and then closed in normal manner by a screw cap (not shown) attached on the neck 12 by the screw thread 13.

The body 10 is conventionally moulded from polyethylene terephthalate polymer (PET) by blow moulding an injection moulded preform or an extruded tubular parison. The configuration of its base 14 is shown in Figure 2, in which it will be seen to have an annular standing ring 15 and a recess or concavity 16 within the standing ring.

The standing ring 15 is formed of outer and inner substantially frustoconical walls 17, 18 joined along a continuous rounded crest 19. The outer wall 17 merges with the bottle side wall 11 around the periphery of the base 14. The inner wall 18 extends from the crest 19 inwardly and upwardly to an elbow 20 at which it joins the circular outer periphery of a convexly domed central panel 21 of the base. The base 14 thus comprises the standing ring 15 formed of the walls 17, 18 and joined along the crest 19, and the central panel 21 which together with the wall 18 defines the recess 16.

In addition to the body 10 the bottle comprises an injection-moulded ring member 23. The ring member 23 is annular, and as seen in cross-section (Figures 2 and 3) has a longer inner flange 24 and a shorter outer flange 25 joined to define a V-section channel in which the crest 19 of the standing ring is nested. To that end the flanges have opposed frustoconical faces 26, 27 which are joined by an annular radius 28 at the base of the channel and are inclined to one another by the angle which the walls of the standing ring will

adopt when the bottle is pressurised with product. The free edge of the inner flange 24 is formed as a further, shallowly frustoconical face 41 conforming to the outer margin of the central panel 21 in the pressurised bottle.

The ring member is injection moulded from PET, and after location on the body in the position shown in Figure 3A is fused directly to the body by a conventional spin-welding operation in which the ring member is rotating at high speed when pressed against the body. Lugs 42 (Figures 2 and 4) are moulded on the inside of the ring member to provide for positive engagement by the spin-welding apparatus (not shown).

During spin-welding the bottle is empty of product and is therefore unpressurised, and, as shown in Figure 3A, contact of the ring member with the body 10 is restricted to the face 27 of the outer flange 25. As indicated at 43, the fusion effected by spin-welding is accordingly limited to this location, that is to say, outboard of the crest 19 of the standing ring. However, after the bottle has been filled with a carbonated beverage product and closed with a screw cap, the carbonation pressure causes the crest 19 to open or "roll" out and the centre panel 21 to adopt a more domed configuration. These movements are small but sufficient to bring the inner wall 18 of the standing ring 15 and the outer margin of the central panel into face-to-face contact with, respectively, the opposed faces 26 and 41 presented by the ring member 23. The inner flange 24 therefore nests snugly into the elbow 20 to restrain further movement in that locality. The relation of the ring member and the body 10 of the filled and closed bottle is therefore as shown in Figure 3B, from which it will be understood that the standing ring is firmly restrained on both sides of the crest 19 against any further opening or rolling out movement in response to the carbonation pressure. The crest itself is still relieved from engagement with the ring member. By virtue of relative longitudinal movement which occurs between the inner wall 18 and the inner flange 24 as the container is being pressurised, the forces between the body 10 and the ring member 23 are substantially normal to the interface of the items 18, 24; however, between the outer wall 17 and the outer flange 25 the corresponding forces are directed substantially along the interface so that the spin-welded bond 43 is largely in shear. The bond is, accordingly, best located to withstand any separation or cam-out forces between the body and the ring member caused by the carbonation pressure.

The face 41 is provided by a thickened end portion 44 of the inner flange 24, in which compressive hoop stresses can be generated to react with the substantial positive pressure which may be exerted on the ring member by the body 10 in that region. It is believed that the pressure progressively reduces along the inner flange 24 in the direction of the crest 19, i.e. in the downward direction as seen in Figures 1 to 3, but the bond 43 prevents any tendency for the body to separate from the surface 26 adjacent to the crest 19.

From the foregoing it will be understood that the ring member serves in an unobtrusive manner, and with a small requirement of material, to hold the bottle base against uncontrolled distortion so that it can be stood upright at all times. For that purpose it has a substantially plane, annular standing surface 30 opposite the radius 28. Some distortion of the PET material of the base 14 will occur both within and outside the ring member, but this will not be apparent to the consumer and will not impair the stability of the bottle.

The ring member is advantageously formed, like the body 10, from PET polymer. The formation of the ring member from the same polymer as the body 10 and its attachment by fusion rather than by an adhesive then enable the bottle material to be readily recycled after use without contamination and without any need to separate the ring member and body from one another beforehand, providing that the bottle is not coated with a different plastic. Furthermore, by use of suitable blow moulding techniques the PET material of the base 14 can be biaxially oriented, that is, partially crystallised, with little or no completely amorphous material remaining; the ring member itself may be rendered crystalline by suitable heat treatment before attachment to the container body, with the result that the assembled container may be thermally stable even under pasteurisation conditions.

In the embodiment described above the ring member is fused directly to the container body by spin-welding. However, other direct welding methods may be used, for example ultrasonic welding or heat sealing.

Figure 5 shows an embodiment of the invention in which the ring member is held mechanically in place on the container body in addition to being welded thereto. The insert 23 is similar to that of the first embodiment in that it has generally frustoconical inner and outer flanges 24, 25 forming a channel in which the crest 19 of the bottle standing ring 15 is located. However, in this embodiment the inner flange 24 is made upwardly divergent. The inner wall 18 of the bottle standing ring likewise has a reverse taper and so locks the ring member mechanically in position against the base. This mechanical interlocking supplements the bond 43 which is formed between the outer flange 23 and the outer wall 17 by spin-welding, ultrasonic welding, or the like as in the embodiment of Figures 1 to 4, whilst again allowing the relative movement of that embodiment between the container and the ring member when the container is pressurised (Figures 2 and 3). Thus Figure 5 is a hybrid arrangement having both mechanical and welded attachment of the ring member to the container.

Figure 6 shows a modification of the embodiment shown in Figures 1 to 4 in which a plurality, e.g. 12 strengthening ribs 60 are moulded on the inner face of the inner flange 24 of the ring member. The ribs, of which only one is shown, are regularly spaced around the ring member; they are axially directed and project radially into the

recess 16. They merge at their top ends with the underside of the thickened top end portion 44 of the ring member, and from there extend downwardly to merge with the generally rounded base 64 of the ring member at their bottom ends. In Figure 6 one of the side faces of the rib 60 is visible and denoted by the reference numeral 61, and the inwardly facing surface between the two sides is denoted 62.

Although specifically described in relation to screw-top bottles for carbonated beverages and made from PET, the invention has application to other types of container, for use with other types of product (whether pressure-generating or otherwise), and made of other thermoplastics resins. One such container is again proposed for a carbonated beverage product and made of PET, but has the form of a wide-mouthed can rather than a screw-top bottle as particularly described above.

Although preferred, it is not essential that the base of a container in accordance with the invention should have a discrete and outwardly domed central panel within the inner wall of the standing ring. For example, the base may be inwardly domed and arcuate, so as to be wholly concave to the exterior of the container and lacking any central panel which is recognisable as such. With such an arrangement the ring member will usually be arranged to extend over an outer marginal region only of the recess.

Production methods other than blow-moulding and injection moulding can be used for, respectively, the container body and the ring member. For example, the ring member can be thermoformed.

Claims

1. A thermoplastics container having a body (10) with a standing base (14), the base (14) being formed with a central recess (16) and having a standing ring (15) with a crest (19) which defines the periphery of the recess (16), for controlling distortion of the base against internal pressure of the container, the container further including a ring member (23) which receives the crest (19) of the standing ring (15) in generally nested relation, characterised in that the ring member (23) is of a thermoplastic polymer which is mutually weldable with that of the base (14), and in that the ring member (23) is welded to the base (14) radially outwardly of the crest (19) but radially inwardly of the crest (19) is free of the base (14) so that the base (14) is movable relative thereto, whereby, radially inwardly of the crest (19), the base (14) is spaced from the ring member (23) when the container is unpressurised, but moves into abutment with the ring member (23) and is thereby supported against further distortion when the container is pressurised.

2. A container according to claim 1, characterised in that the ring member (23) and the body (10) are moulded from the same thermoplastics polymer.

3. A container according to claim 1 or claim 2, characterised in that the ring member (23) is spin-welded to the body base (14).

4. A container according to any preceding claim, characterised by being arranged so that, when pressurised, the weld between the ring member (23) and the body base (14) outside the crest (19) is substantially in shear, whereas within the crest the forces between the body base (14) and the ring member (23) at the said abutment therebetween are substantially normal to the interface of the body base (14) and the ring member (23).

5. A container according to any preceding claim, characterised in that the standing ring (15) has a substantially frustoconical inner wall (18) and an upwardly and outwardly tapering, substantially frustoconical outer wall (17) and the body base (14) further comprises a convexly domed central panel (21) joined to the inner periphery of the inner wall (18) at an elbow, and located within the recess (16).

6. A container according to claim 5, characterised in that the ring member (23) is adapted to engage the inner frustoconical wall (18) over substantially the whole of its length, and has a terminal surface (41) for engagement with an outer marginal region of the central panel (21).

7. A container according to claim 6, characterised in that the terminal surface (41) is provided by a thickened terminal portion (44) of the ring member (23), within which substantial hoop stresses may be generated when the container is pressurised.

8. A container according to any claim of claims 5 to 7, characterised in that the inner wall (18) of the standing ring (15) tapers upwardly and radially inwardly.

9. A container according to any claim of claims 1 to 7, characterised in that the standing ring (15) has a substantially frustoconical inner wall (24) which tapers outwardly and upwardly, and the ring member (23) is adapted to correspondingly engage the inner wall (18) so as to be mechanically interlocked to the container body (10) by such engagement.

10. A container according to any preceding claim, characterised in that within the recess (16) the ring member (23) is formed with a plurality of circumferentially spaced, inwardly projecting strengthening ribs (60).

11. A container according to any preceding claim, characterised in that at least the body (10) is moulded from PET.

12. A container according to any preceding claim, characterised in that the body base (14) is biaxially oriented so as to include little or no amorphous material and the ring member (23) is rendered crystalline by heat treatment, the container thereby having thermal stability to elevated temperatures.

Patentansprüche

1. Thermoplastischer Behälter mit einem Kör-

recess 16. They merge at their top ends with the underside of the thickened top end portion 44 of the ring member, and from there extend downwardly to merge with the generally rounded base 64 of the ring member at their bottom ends. In Figure 6 one of the side faces of the rib 60 is visible and denoted by the reference numeral 61, and the inwardly facing surface between the two sides is denoted 62.

Although specifically described in relation to screw-top bottles for carbonated beverages and made from PET, the invention has application to other types of container, for use with other types of product (whether pressure-generating or otherwise), and made of other thermoplastics resins. One such container is again proposed for a carbonated beverage product and made of PET, but has the form of a wide-mouthed can rather than a screw-top bottle as particularly described above.

Although preferred, it is not essential that the base of a container in accordance with the invention should have a discrete and outwardly domed central panel within the inner wall of the standing ring. For example, the base may be inwardly domed and arcuate, so as to be wholly concave to the exterior of the container and lacking any central panel which is recognisable as such. With such an arrangement the ring member will usually be arranged to extend over an outer marginal region only of the recess.

Production methods other than blow-moulding and injection moulding can be used for, respectively, the container body and the ring member. For example, the ring member can be thermoformed.

Claims

1. A thermoplastics container having a body (10) with a standing base (14), the base (14) being formed with a central recess (16) and having a standing ring (15) with a crest (19) which defines the periphery of the recess (16), for controlling distortion of the base against internal pressure of the container, the container further including a ring member (23) which receives the crest (19) of the standing ring (15) in generally nested relation, characterised in that the ring member (23) is of a thermoplastic polymer which is mutually weldable with that of the base (14), and in that the ring member (23) is welded to the base (14) radially outwardly of the crest (19) but radially inwardly of the crest (19) is free of the base (14) so that the base (14) is movable relative thereto, whereby, radially inwardly of the crest (19), the base (14) is spaced from the ring member (23) when the container is unpressurised, but moves into abutment with the ring member (23) and is thereby supported against further distortion when the container is pressurised.

2. A container according to claim 1, characterised in that the ring member (23) and the body (10) are moulded from the same thermoplastics polymer.

3. A container according to claim 1 or claim 2, characterised in that the ring member (23) is spin-welded to the body base (14).

4. A container according to any preceding claim, characterised by being arranged so that, when pressurised, the weld between the ring member (23) and the body base (14) outside the crest (19) is substantially in shear, whereas within the crest the forces between the body base (14) and the ring member (23) at the said abutment therebetween are substantially normal to the interface of the body base (14) and the ring member (23).

5. A container according to any preceding claim, characterised in that the standing ring (15) has a substantially frustoconical inner wall (18) and an upwardly and outwardly tapering, substantially frustoconical outer wall (17) and the body base (14) further comprises a convexly domed central panel (21) joined to the inner periphery of the inner wall (18) at an elbow, and located within the recess (16).

6. A container according to claim 5, characterised in that the ring member (23) is adapted to engage the inner frustoconical wall (18) over substantially the whole of its length, and has a terminal surface (41) for engagement with an outer marginal region of the central panel (21).

7. A container according to claim 6, characterised in that the terminal surface (41) is provided by a thickened terminal portion (44) of the ring member (23), within which substantial hoop stresses may be generated when the container is pressurised.

8. A container according to any claim of claims 5 to 7, characterised in that the inner wall (18) of the standing ring (15) tapers upwardly and radially inwardly.

9. A container according to any claim of claims 1 to 7, characterised in that the standing ring (15) has a substantially frustoconical inner wall (24) which tapers outwardly and upwardly, and the ring member (23) is adapted to correspondingly engage the inner wall (18) so as to be mechanically interlocked to the container body (10) by such engagement.

10. A container according to any preceding claim, characterised in that within the recess (16) the ring member (23) is formed with a plurality of circumferentially spaced, inwardly projecting strengthening ribs (60).

11. A container according to any preceding claim, characterised in that at least the body (10) is moulded from PET.

12. A container according to any preceding claim, characterised in that the body base (14) is biaxially oriented so as to include little or no amorphous material and the ring member (23) is rendered crystalline by heat treatment, the container thereby having thermal stability to elevated temperatures.

Patentansprüche

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per (10) mit einer Standbasis (14), welche Basis (14) mit einer zentralen Ausnehmung (16) ausgebildet ist und einen Standring (15) mit einem den Umfang der Ausnehmung (16) begrenzenden Kamm (19) aufweist, zwecks Aussteuern der Verformung der Basis gegen den Innendruck des Behälters, welcher Behälter weiters ein Ringelement (23) enthält, das den Kamm (19) des Standrings (15) in im allgemeinen ineinandergesteckter Beziehung aufnimmt, dadurch gekennzeichnet, daß das Ringelement (23) aus einem thermoplastischen Polymerisat besteht, das mit jenem der Basis (14) verschweißbar ist, und daß das Ringelement (23) radial außerhalb des Kamms (19) an der Basis (14) angeschweißt ist, aber radial innerhalb des Kamms (19) frei von der Basis (14) ist, sodaß die Basis (14) relativ zu dieser beweglich ist, wodurch sich die Basis (14) radial innerhalb des Kamms (19) bei drucklosem Behälter in einem Abstand vom Ringelement (23) befindet, bei unter Druck befindlichem Behälter aber in Anlage an das Ringelement (23) kommt und dadurch gegen weitere Verformung gestützt ist.

2. Behälter nach Anspruch 1, dadurch gekennzeichnet, daß das Ringelement (23) und der Körper (10) aus demselben thermoplastischen Polymerisat geformt sind.

3. Behälter nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß das Ringelement (23) an die Körperbasis (14) rotationsgeschweißt ist.

4. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß er so angeordnet ist, daß unter Druck die Schweißung zwischen dem Ringelement (23) und der Körperbasis (14) außerhalb des Kamms (19) im wesentlichen scherbeansprucht ist, wogegen innerhalb des Kamms die Kräfte zwischen der Körperbasis (14) und dem Ringelement (23) bei besagter Anlage aneinander im wesentlichen normal zur Grenzfläche zwischen Körperbasis (14) und Ringelement (23) sind.

5. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Standring (15) eine im wesentlichen kegelstumpfförmige Innenwand (18) und eine sich nach oben und nach Außen hin verjüngende, im wesentlichen kegelstumpfförmige Außenwand (17) aufweist, und daß die Körperbasis (14) weiters eine konvex bombierte zentrale Platte (21), die knieförmig mit dem Innenumfang der Innenwand (18) verbunden ist und sich innerhalb der Ausnehmung (16) befindet, umfaßt.

6. Behälter nach Anspruch 5, dadurch gekennzeichnet, daß das Ringelement (23) mit der kegelstumpfförmigen Innenwand (18) im wesentlichen über ihre gesamte Länge in Eingriff gelangen kann und eine Abschlußfläche (41) zum Eingriff mit einem äußeren Randbereich der zentralen Platte (21) aufweist.

7. Behälter nach Anspruch 6, dadurch gekennzeichnet, daß die Abschlußfläche (41) durch einen verdickten Endabschnitt (44) des Ringelements (23) vorgesehen ist, innerhalb welches wesentliche Umfangsspannungen erzeugt werden können, wenn der Behälter unter Druck gesetzt ist.

8. Behälter nach einem der Ansprüche 5 bis 7, dadurch gekennzeichnet, daß sich die Innenwand (18) des Standrings (15) nach oben und radial nach innen verjüngt.

9. Behälter nach einem der Ansprüche 1 bis 7, dadurch gekennzeichnet, daß der Standring (15) eine im wesentlichen kegelstumpfförmige Innenwand (24) aufweist, die sich nach außen und nach oben verjüngt, und das Ringelement (23) zum entsprechenden Eingriff mit der Innenwand (18) ausgestaltet ist, um durch einen solchen Eingriff am Behälterkörper (10) mechanisch verriegelt zu sein.

10. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Ringelement (23) innerhalb der Ausnehmung (16) mit einer Mehrzahl von umfangsmäßig im Abstand angeordneten, nach innen vorragenden Verstärkungsrippen (60) ausgebildet ist.

11. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß zumindest der Körper (10) aus PET geformt ist.

12. Behälter nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Körperbasis (14) zwecks geringem oder keinem Gehalt an amorphem Material biaxial gereckt ist und das Ringelement (23) durch Wärmebehandlung kristallin gemacht ist, wodurch der Behälter bei erhöhten Temperaturen hitzebeständig ist.

Revendications

1. Récipient en thermoplastique comportant un corps (10) à base de station debout (14), la base (14) présentant un renforcement central (16) et comportant un anneau de station debout (15) à crête (19) qui définit le pourtour du renforcement (16), destiné à maîtriser la déformation de la base à l'encontre de la pression interne du récipient, le récipient comportant encore un élément annulaire (23) qui reçoit la crête (19) de l'anneau de station (15) en relation générale d'emboîtement, caractérisé en ce que l'élément annulaire (23) est en un polymère thermoplastique mutuellement soudable avec celui de la base (14), et en ce que l'élément annulaire (23) est soudé à la base (14) radialement à l'extérieur de la crête (19) mais est, radialement à l'intérieur de la crête (19), libre par rapport à la base (14) de façon que la base (14) soit mobile par rapport à lui de sorte que, radialement à l'intérieur de la crête (19), la base (14) est espacée de l'élément annulaire (23) quand le récipient n'est pas sous pression, mais vient s'abouter contre l'élément annulaire (23) et est par là supportée à l'encontre de toute déformation ultérieurement quand le récipient est sous pression.

2. Récipient selon la revendication 1, caractérisé en ce que l'élément annulaire (23) et le corps (10) sont moulés en le même polymère thermoplastique.

3. Récipient selon la revendication 1 ou la revendication 2, caractérisé en ce que l'élément annulaire (23) est soudé par rotation à la base (14) du corps.

4. Récipient selon toute revendication précé-



dente, caractérisé en ce qu'il est agencé en sorte que, lorsqu'il est sous pression, la soudure entre l'élément annulaire (23) et la partie de la base de corps (14) extérieure à la crête (19) travaille sensiblement en cisaillement, tandis qu'à l'intérieur de la crête les forces s'exerçant entre la base de corps (14) et l'élément annulaire (23) au niveau dudit aboutement entre ces éléments sont sensiblement normales à l'interface de la base de corps (14) et de l'élément annulaire (23).

5. Récipient selon toute revendication précédente, caractérisé en ce que l'anneau de station debout (15) présente une paroi intérieure sensiblement tronconique (18) et une paroi extérieure sensiblement tronconique à conicité dirigée vers le haut et l'extérieur (17) et la base de corps (14) comporte encore un panneau central en dôme convexe (21) réuni au pourtour intérieur de la paroi intérieure (18) au niveau d'un coude, et placé à l'intérieur du renforcement (16).

6. Récipient selon la revendication 5, caractérisé en ce que l'élément annulaire (23) est agencé pour porter contre la paroi tronconique intérieure (18) sur la quasi-totalité de sa longueur et présente une surface terminale (41) destinée à porter contre une région marginale extérieure du panneau central extérieur (21).

7. Récipient selon la revendication 6, caractérisé en ce que la surface terminal (41) est constituée par un tronçon terminal épaissi (44) de l'élément annulaire (23), à l'intérieur duquel des contraintes

en cerceau notables peuvent être engendrées quand le récipient est sous pression.

8. Récipient selon l'une quelconque des revendications 5 à 7, caractérisé en ce que la paroi intérieure (18) de l'anneau de station debout (15) a une conicité dirigée vers le haut et radialement vers l'intérieur.

9. Récipient selon l'une quelconque des revendications 1 à 7, caractérisé en ce que l'anneau de station debout (15) présente une paroi intérieure tronconique (24) conicité dirigée vers l'extérieur et vers le haut, et l'élément annulaire (23) est propre à porter de manière correspondante contre la paroi intérieure (18) de façon à se trouver verrouillé mécaniquement sur le corps de récipient (10) par ce contact.

10. Récipient selon toute revendication précédente, caractérisé en ce qu'à l'intérieur du renforcement (16) l'élément annulaire (23) présente une série de nervures de renfort saillant vers l'intérieur (60), angulairement espacées.

11. Récipient selon toute revendication précédente, caractérisé en ce que le corps (10) au moins est moulé en TPE.

12. Récipient selon toute revendication précédente, caractérisé en ce que la base de corps (14) est orientée biaxialement de façon à ne comporter que peu ou point de matière amorphe et l'élément annulaire (23) est rendu cristallin par traitement thermique, le récipient ayant par là une stabilité thermique aux températures élevées.

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