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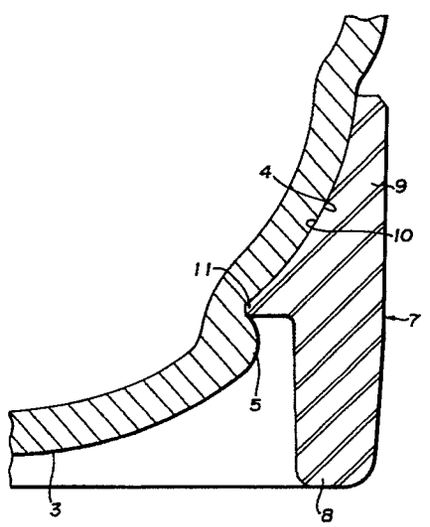
(54) BOTTLE MADE OF SYNTHETIC RESIN.

(57) A bottle made of synthetic resin and composed of a body and a stand to keep the bottle upright stably. The bottle body (1) is made of synthetic resin by biaxial stretching blow molding, inwardly recessed at the bottom central part (6), and provided with a wide engagement groove (4) formed around the outer periphery thereof. The stand (7) is a short cylinder nearly equal to the trunk (2) of the body (1) in outer diameter and the upper half thereof is an engagement cylinder (9) to be engaged with the groove (4) of the bottle body (1) whereas the lower half is a cylindrical leg (8) positioned below the lowermost end of the bottom (3) of the bottle body when engaged with the bottle. The stand is accurately and easily engaged with the bottle body and enhances the impact resistance of the bottom of the bottle.

FIG. 2



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BACKGROUND OF THE INVENTION

This invention relates to a relatively large synthetic resin bottle-shaped container.

Biaxially oriented blow-molded bottle-shaped containers made of acrylonitrile resin or polyethylene terephthalate resin are popularly used because of their mechanical strength, transparency and other excellent properties.

Such biaxially oriented blow-molded bottle-shaped containers are generally divided into two groups: those having a semispherically bulged bottom for an enhanced internal pressure resistivity and provided with a base cup that serves as a stand and those having a bottom with an internally depressed central area that serves as a stand for self-standing without a base cup.

A bottle-shaped body having a self-standing capability is advantageous over a bottle-shaped body provided with a base cup in terms of easy cleaning, sterilization, molding and assembling as well as of overall appearance.

However, a self-standing bottle-shaped body has only a small bottom area that supports the bottle-shaped body relative to the cross sectional area of a body portion and therefore is less stable when it stands by itself.

More specifically, when a circular peripheral portion of the bottom that serves as a stand for the bottle-shaped body is formed by depressing the central area of the bottom by blow-molding, the circular peripheral portion of the bottom is inevitably located nearer to the center of the bottom than the outer circumference of the body portion. This fact results in the reduced bottom area that supports the bottle-shaped body in an upright condition.

Moreover, when a high internal pressure is applied to such a self-standing bottle-shaped body, the bottom portion forming a stand is subjected to a relatively large expansion, which in turn adversely affects the self-standing capability of the bottle-shaped body to a significant extent. Such an expansion can results in an deformation.

On the other hand, in a bottle-shaped body provided with a base cup for keeping it upright, the height of the base cup is required to be of a relatively large in order to accommodate the outwardly projecting semispherical bottom portion of the bottle-shaped body so that the overall appearance of the bottle-shaped container will be aesthetically poor because of the disproportional large base cup. Moreover, the bottom of such a bottle-shaped body can not protect expansion and deformation when a large internal pressure is applied thereto.

Besides, a biaxially oriented blow-molded bottle-shaped container made of acrylonitrile resin is insufficiently resistive to shocks applied to the bottom and can produce cracks and fissures on the bottom when it is inadvertently dropped.

SUMMARY OF THE INVENTION

In view of the above described problems, it is therefore the object of the present invention to provide a bottle-shaped container having a depressed area at the center of the bottom for providing with a pedestal as self-standing means wherein said bottom has an enhanced and stable self-standing capability and protects any expansion and deformation and at the same time has highly resistive to shocks.

According to the invention, the above object is achieved by providing a synthetic resin bottle-shaped container comprising a biaxially-oriented blow-molded bottle-shaped body having a relatively long press-fit recess on a curved outer peripheral surface area of a curved bottom portion and a cylindrical pedestal body having a straight and cylindrical upper half portion with an outer diameter substantially equal to that of a body portion of said bottle-shaped container, said upper portion being so configured as to be closely engaged with said press-fit recess at its curved inner peripheral surface, said cylindrical pedestal body further having a hollow pedestal-shaped lower half portion for accommodating the bottom of said bottle-shaped body portion so that the lowest end of the lower half portion of said pedestal body is positioned below the lowest end of the bottom portion of the body portion.

Said press-fit recess formed on the curved peripheral surface area of the bottle-shaped body is preferably so formed that the recess is progressively deeper toward the lower end thereof.

Since the press-fit recess is formed in progressively deeper toward the lower end thereof on the curved outer peripheral surface area of the bottom portion, and the matching curved inner surface area which is formed on the inner peripheral surface of the upper half portion of the cylindrical pedestal body is tapered toward the upper end thereof. Therefore, the bottom of the bottle-shaped body is closely engaged with the pedestal body by simply pressing downward the bottle-shaped body until said curved outer peripheral surface area of the bottom of the bottle-shaped body is completely in contact with the matching curved inner peripheral surface area of the cylindrical upper half portion of the pedestal body.

When said press-fit recess formed on the curved outer peripheral surface area of the bottle-shaped body is so configured that the recess is progressively deeper toward the lower end thereof and a relatively high projecting portion is provided

at the lower end of the press-fit recess, a press-fit rib projecting at the lower end of the curved inner peripheral area of the cylindrical upper half portion of the pedestal body is closely engaged with the high projecting portion to produce a firm and stable engagement between the bottle-shaped body and the pedestal body.

With such an arrangement, since the curved outer peripheral surface of the bottom of the bottle-shaped body is closely engaged with the inner surface of the pedestal body, an enhanced inner pressure is supported by the inner surface of the pedestal body, and the bottom of the bottle-shaped body is protected against any undesirable expansion and deformation due to such an enhanced inner pressure.

Besides, since the lowest end of the lower half portion of the pedestal body is always positioned below the lower end of the bottom of the bottle-shaped body, the lower end surface of pedestal body provides a firm and stable support for the bottle-shaped body regardless of expansion and deformation of its bottom.

Moreover, since the pedestal body is not integral with the bottle-shaped body and the pedestal body serves as a shock absorber that effectively protects the bottom of the bottle-shaped body from cracks and fissures, the bottom of the bottle-shaped body has sufficiently high sensitivity to any shocks even if the bottle-shaped container is made of acrylonitrile resin and it is dropped from a high position.

Now the present invention will be described in greater detail by referring to the accompanying drawings that illustrate a preferred embodiment of the invention.

BRIEF EXPLANATION OF THE DRAWINGS

Fig. 1 is a front view of the embodiment showing the pedestal body in partial longitudinal cross section.

Fig. 2 is an enlarged longitudinal sectional view showing only the encircled area in Fig. 1.

PREFERRED EMBODIMENT

In Figs. 1 and 2, reference numeral 1 denotes a biaxially-oriented blow-molded bottle-shaped body portion made of synthetic resin and a bottom portion 3 is integrally formed at the lower end of the body portion 2 of the bottle portion 1. The bottom section 3 has a depressed area 6 at the center thereof and a peripheral projecting area surrounding said depressed area can serve as a stand or support structure in a conventional hollow bottle-shaped body of the self-standing type.

Now referring to Fig. 2, a relatively long press-fit recess 4 is formed on the outer peripheral surface area of the curved surface of the bottom portion 3 near the body portion 2 and the recess 4 is so configured that its depth is progressively increased as it approaches the lower end thereof. Therefore, a relatively high projecting portion 5 is formed at the lower end of the press-fit recess 4.

On the other hand, a pedestal body 7 for supporting the bottle-shaped body 1 is formed as a whole in the form of a short and straight cylinder and an upper half cylindrical portion 9 of the pedestal body 7 is provided with a curved inner surface area 10 matching the outer peripheral surface area of the press-fit recess 4. Since the both curved surfaces have a same radius of curvature, they are closely engaged with each other in a press-fit manner when assembled. A press-fit rib 11 is projected at the lower end of said curved inner surface area 10 of the upper half cylindrical portion 9 of the pedestal body and is closely engaged with the lower edge of the press-fit recess 4 when assembled.

With such an arrangement, since a step is formed at the boundary between the press-fit cylindrical upper half portion 9 and the lower half pedestal portion 8 of the pedestal body 7, the projecting portion 5 does not constitute any obstacle when the bottle-shaped body 1 and the pedestal body 7 are assembled.

Said press-fit rib 11 is so sectionally constructed in a sharp top shape that it can be resiliently deformed. While, the curved inner surface area 10 is so tapered toward the upper end thereof that it provides a guide surface for properly engaging the bottle-shaped body 1 with the pedestal body 7. The press-fit rib 11 can be resiliently deformed and easily pass over the projecting portion 5 for engagement of the bottle-shaped body 1 and the pedestal body 7 when they are assembled together.

Because of the engagement between the rib 11 and the projecting portion 5, the pedestal body 7 is strongly fitted to the bottom portion 3 of the bottle-shaped body 1 once they are assembled.

Said pedestal body 7 is made of a synthetic resin material which is highly resistive against shocks and therefore can provide satisfactory protection for the bottle-shaped body 1 against external shocks even when the bottom portion 3 of the bottle-shaped body 1 is made of acrylonitrile resin.

Because of the construction described above, the present invention provides the following advantages.

Firstly, since the pedestal body is formed in the form of a short and straight cylinder having an outer diameter substantially identical with that of the body portion of the bottle-shaped container, the flat bottom surface of the lower end of the pedestal

body provides the stable support for the bottle-shaped body in its upright position.

Secondly, since the overall height of the pedestal body is only slightly greater than that of the bottom portion having a depression at the center thereof, the pedestal body has a sufficiently reduced height relative to that of the elongated bottle-shaped main body. Consequently, the pedestal body does not provide poor impression of the container in appearance.

Thirdly, since the pedestal body is tightly press fitted to the outer peripheral area of the bottom portion of the bottle-shaped body, it can effectively prevent any expansion and deformation of the bottom portion occurring due to an enhanced internal pressure. Consequently, the resistance against the inner pressure of the bottle-shaped body having a depressed central area at the bottom portion can be considerably increased.

Additionally, since the bottle-shaped body is closely engaged with the pedestal body by a simple press-fit operation, the two bodies can be assembled without any difficulty. Moreover, since the two bodies are conveniently and mutually guided to a proper position, they can be accurately assembled.

Finally, since the pedestal body is made of a highly shock-absorbing synthetic resin material, it can effectively protect the bottom portion of the bottle-shaped body from external impacts, and prevent the bottle-shaped body from damages when the container is dropped even if the container is made of a material having a relatively poor shock resistivity such as acrylonitrile resin.

Claims

1. A synthetic resin bottle-shaped container comprising;

a biaxially-oriented blow-molded bottle-shaped body (1) having a relatively long press-fit recess (4) on a curved outer peripheral surface area of a curved bottom portion (3); and

a cylindrical pedestal body (7) having a straight and cylindrical upper half portion (9) with an outer diameter substantially equal to that of a body portion (2) of said bottle-shaped body (1) and a hollow pedestal-shaped lower half portion (8); wherein

said upper half portion (9) of the pedestal body (7) is so configured as to be closely engaged with said press-fit recess at its curved inner peripheral surface (10), and

said hollow pedestal-shaped lower half portion (8) of the pedestal body (7) is so configured as to accommodate the bottom of said bottle-shaped body (1) so that the lowest end of the lower half portion of said pedestal body (7) is positioned below the lowest end of the bottom portion of the body (1).

2. The synthetic resin bottle-shaped container according to claim 1, wherein said press-fit recess (4) formed on the curved outer peripheral surface area of the bottom portion (3) of the bottle-shaped body is so formed that the recess is progressively deeper toward the lower end thereof.

FIG. 1

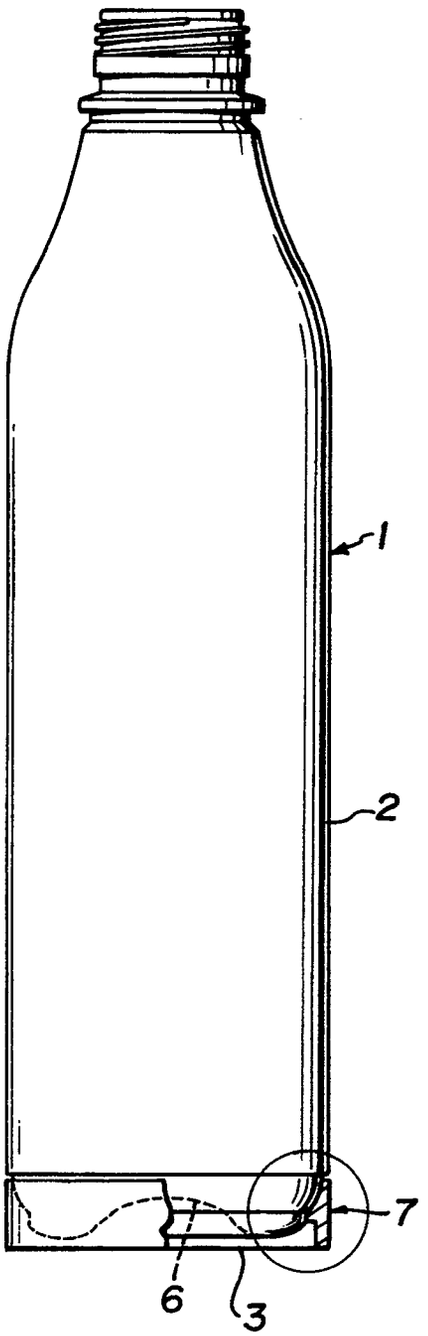
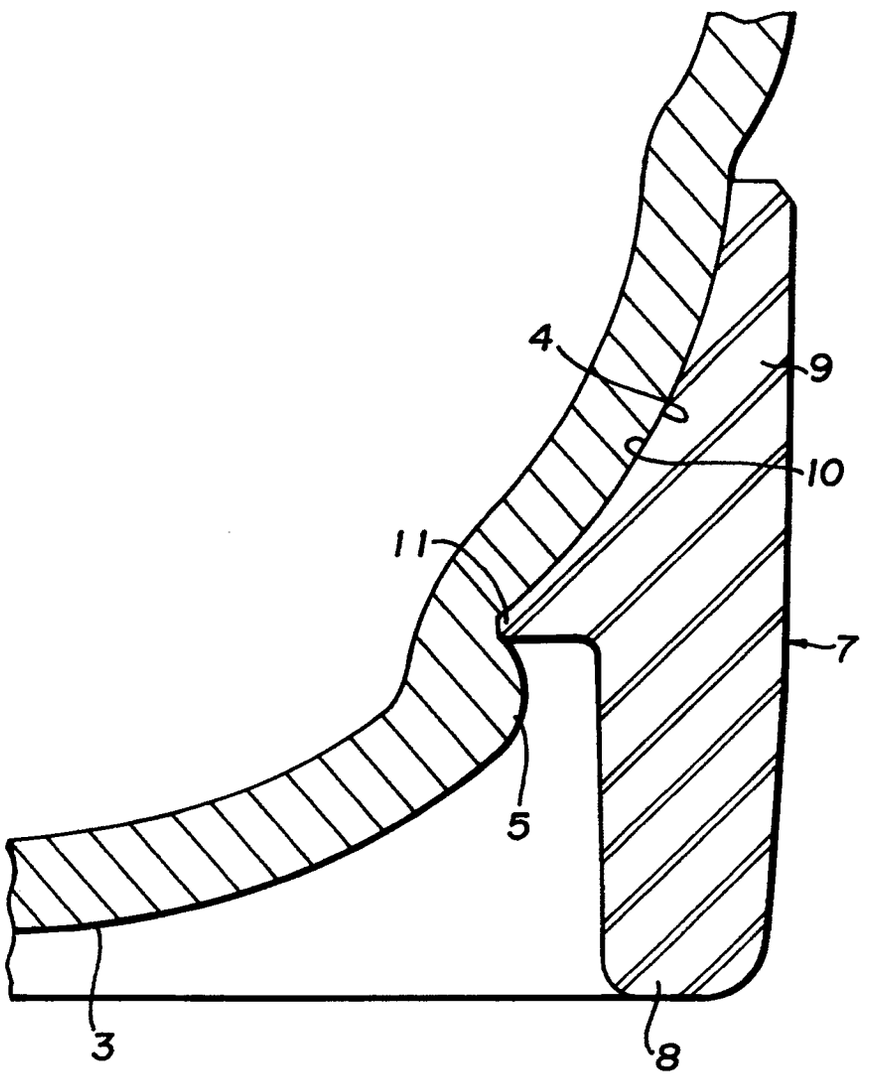


FIG. 2



INTERNATIONAL SEARCH REPORT

International Application No PCT/JP90/00867

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl[5] B65D23/00

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
IPC	B65D23/00

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

Jitsuyo Shinan Koho	1925 - 1988
Kokai Jitsuyo Shinan Koho	1973 - 1989

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y	JP, A, 51-30068 (Illinois Tool Works Inc.), 13 March 1976 (13. 03. 76), Fig. 4 & US, A, 3927782 & BE, A2, 830892 & DK, A, 297075 & NO, A, 752407 & SE, A, 7507503 & NL, A, 7507875 & DE, A1, 2529334 & FR, A1, 2276998 & BR, A, 7504080 & AU, A1, 8263675 & CA, A1, 1021276 & GB, A, 1509289 & FR, B3, 2276998 & IT, A, 1039611	1, 2
Y	JP, Y2, 60-38498 (Toyo Seikan Kaisha, Ltd.), 18 November 1985 (18. 11. 85), Fig. 2	1
Y	JP, Y2, 53-9576 (Sekisui Plastics Co., Ltd.), 13 March 1978 (13. 03. 78), Fig. 2	1
Y	JP, U, 58-3445 (Dainippon Printing Co., Ltd.), 10 January 1983 (10. 01. 83), Fig. 1	1

* Special categories of cited documents: [10]

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
September 20, 1990 (20. 09. 90)	October 1, 1990 (01. 10. 90)
International Searching Authority	**Signature of Authorized Officer**
Japanese Patent Office	