Feb. 17, 1970 P. DAVIS 3,495,733

PLASTIC CONTAINERS

Filed Nov. 21, 1968

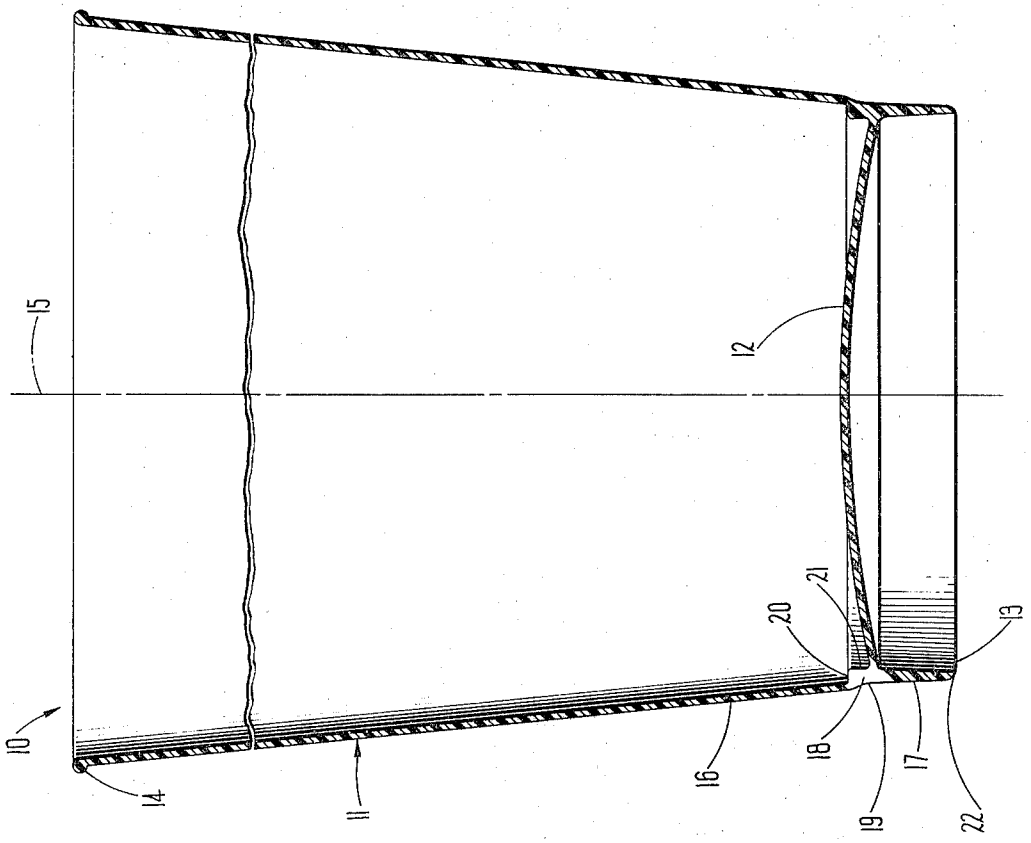


FIG. 1

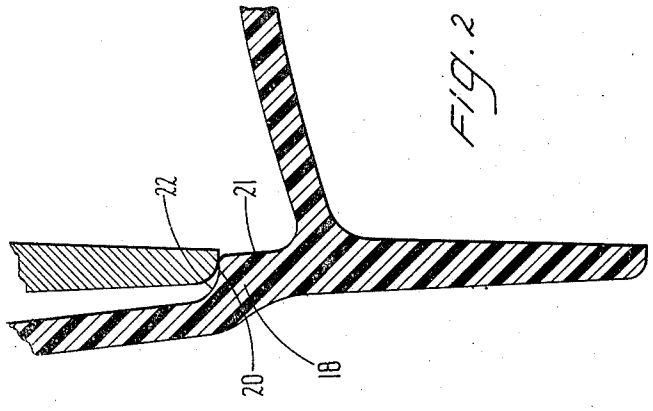


FIG. 2

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United States Patent Office 3,495,733
Patented Feb. 17, 1970

3,495,733

PLASTIC CONTAINERS

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Filed Nov. 21, 1968, Ser. No. 777,594
Int. Cl. A47g 19/23; B65d 21/02, 1/16
U.S. Cl. 220—97 4 Claims

ABSTRACT OF THE DISCLOSURE

Plastic containers are provided of the injection molded type which comprise a side wall having a top edge and a bottom edge defining a bottom plane with the side wall tapering generally outwardly from the bottom edge to the top edge. A transverse bottom wall is positioned above the bottom plane to form a false bottom and meets the side wall at an inwardly extending rim portion of the side wall. A lower portion of the side wall extends directly below the inwardly extending rim portion with the rim portion defining a stacking ledge in the side wall. The taper of the side wall is predetermined to prevent jamming of the side wall when one container is stacked in another with the bottom edge of one container resting on the stacking ledge and positioned over the lower edge of the second container.

BACKGROUND OF THE INVENTION

Injection molded plastic tumblers, glasses and containers of various sorts have come into increasing use. Some difficulties are encountered in the construction of such containers in connection with stacking and nesting of the containers. Structural deficiencies often exist, particularly with false bottom containers, i.e., containers having transverse bottom walls spaced above the lower edge of the side wall. When stacking lugs are positioned on the inside of the side walls, due to the somewhat frangible nature of many plastics used, the lugs tend to crack or chip when subjected to stress as when a stack is dropped during handling or shipment. When the containers are nested so that the lower edge of the side wall rests directly on the bottom wall of an adjacent container in a stack, there is a possibility of cracking or stressing the bottom wall at the junction between the bottom wall and the side wall.

It is an object of the present invention to provide a structurally strong plastic container which can be efficiently stacked with similar containers.

SUMMARY OF THE INVENTION

According to the invention, a plastic container comprises a side wall defining a top edge and a bottom edge with the side wall having an integral inwardly extending rim portion. The bottom edge defines a bottom plane. The side wall tapers outwardly from bottom to top and a transverse bottom wall is positioned above the bottom plane to form a false bottom which meets the side wall at the rim portion. A lower portion of the side wall extends directly below the rim side wall portion with the rim portion defining a stacking ledge in the side wall. The taper of the side wall is predetermined to prevent jamming of the side wall of one container with the side wall of another identical container when the containers are stacked with the bottom edge of one container resting on the stacking ledge and positioned over the lower edge.

Since the stacking ledge is directly above the lower portion of the side wall, there is substantially no sheer stress tending either to separate the rim portion from the main body of the side wall or to separate the bottom wall from the side wall when identical containers are

nested. Moreover, the present construction enables ease and efficiency of high speed production by conventional injection molding procedures.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other features and advantages of the present invention will be better understood from the following specification when read in connection with the accompanying drawings in which:

FIG. 1 is a cross sectional view taken through the central axis of a preferred embodiment of an injection molded plastic drinking glass of this invention; and

FIG. 2 is an enlarged fragmentary cross sectional view through a lower portion of two such identical glasses.

DESCRIPTION OF PREFERRED EMBODIMENTS

With reference now to the drawings, an injection molded plastic drinking glass is illustrated generally at **10** in FIG. 1 and has an upwardly and outwardly extending continuous generally frustro-conical side wall **11** closed substantially near its bottom by an integral bottom wall **12** to form an integral plastic container.

The glass **10** is preferably formed by conventional injection molding techniques as an integral unit of clear polystyrene. In addition to polystyrene, other conventional injection molding plastics can be used including but not limited to polyethylene, polypropylene, acrylates, polystyrene mixtures and copolymers with other synthetic organic materials such as rubbers to form impact polystyrene.

The side wall **11** preferably tapers upwardly and outwardly from its bottom edge **13** to its top edge **14** both of which preferably lie in parallel planes with the side wall symmetrical about a central axis **15** of the glass. The upward inclination of the side wall is predetermined to prevent jamming of the side wall of one container with the side wall of another identical container when the containers are stacked with the bottom edge of one container resting on the stacking ledge as will be described.

The side wall **11** has an upper portion **16** above the bottom wall **12** and a lower portion **17** forming a base for the glass and lying below the bottom wall **12**. Intermediate the upper and lower portions of the side wall is an integral rim portion **18** defining a gentle curve **19** on the outside of the glass.

The rim portion **18** defines a preferably continuous horizontal stacking ledge **20** on the inside of the glass. The stacking ledge **20** is positioned directly above the lower edge **13** when the glass is upright and the wall portion **17** and rim portion **18** define a solid support column. In some cases, ledge **20** is slightly downwardly inclined toward the cup axis and has a frustro-conical shape to aid in centering one glass in another when stacked.

The stacking ledge **20** preferably has an inside diameter at an inner cylindrical wall **21** less than the outside diameter of the lower side wall portion **17** at the lower portion thereof denoted at **22**. When two identical glasses **10** are stacked as illustrated in FIG. 2, pressures of the top glass on the lower glass are transmitted vertically through solid plastic to the bottom plane defined by the bottom edge **13**. Thus, there is substantially no shearing stress tending to shear a portion lying below the stacking ledge from the main portion of the side wall.

The height of the ledge **20** above the bottom wall can vary greatly but is preferably minimized in order to minimize nesting height of a column of stacked glasses. Preferably the height above the bottom wall is sufficient to strengthen the cup at the junction of the bottom wall with the side wall and may be in the order of at least 1/16 of an inch.

The bottom wall **12** shown preferably has a dome shape positioned to provide a false bottom. Flat false bottoms can also be used.

In a preferred embodiment of this invention, the side wall **11** has a substantially uniform thickness of 0.025 inch with a thicknes at the rim portion **18** of .05 inch and an upward inclination of 5° 30 minutes from a vertical axis. The height of the stacking ledge **20** is 0.063 inch. The over-all height of the cup is 3.99 inches, the outside diameter at the top is 2.9 inches and the diameter at the bottom is 2.040 inches.

While a specific embodiment of the present invention has been shown and described, it should be understood that many variations are possible. For example, the height of the annular rim created on the inside of the cup which forms the substantially horizontal stacking ledge **20** can vary considerably as can the dimensions of the glass and the side wall thickness. In all cases, the side wall thickness is maintained within the range of from 0.01 to 0.60 inch and preferably 0.02 to 0.06 inch with the exception of the rim portion **18** which preferably has a thickness twice that of the side wall portion **16**. In some cases, it is desirable to form venting means on the rim portion to permit air passage from the top edge **14** to the space between bottom walls **12** of two stacked glasses. The vents can be simple indentations in the rim portion extending from ledge **20** to wall **21**. The number and dimensions of such vents if used are minimized to maintain the ledge substantially continuous so as to maximize the area thereof available to counter impact forces. In some cases, venting can be accomplished by providing indentations at edge **13**, extending substantially radially through the side wall.

Thus, in some cases, a stacking ledge can be provided by a substantially uniform or decreased thickness side wall portion having an outer configuration following the contour of the inner surface such as provided by ledge **20** and wall **21** and such configuration is included within the scope of this invention. While the rim portion which forms the stacking ledge of the preferred embodiment has a thickness greater than the thickness of other portions of the side wall, the rim portion does not have to have increased side wall thickness.

What is claimed is:

1. A one-piece, injection molded, solid plastic container comprising,

a sidewall having a top edge, a bottom edge defining a bottom plane and a rim portion between said top edge and said bottom plane,

said sidewall being inclined upwardly and outwardly from bottom to top,

a lower portion of said side wall extending directly below said rim portion and having a thickness forming a solid support column with said rim portion,

a transverse bottom wall positioned above said bottom plane to form a false bottom meeting said side wall at said rim portion,

said rim portion defining a stacking ledge in said side wall axially spaced from said bottom wall and lying directly above said solid support column,

the inclination of said side wall being predetermined to prevent jamming of the side wall of one container with the side wall of another identical container when said containers are stacked with the bottom edge of said one container resting on the stacking ledge of the other container and positioned over the bottom edge of said other container whereby forces exerted by said bottom edge of said one container are transmitted directly through solid plastic to said bottom edge of said other container.

2. An integral plastic container in accordance with claim **1** wherein said side wall has a thickness in the range of from 0.02 to 0.60 inch.

3. A plastic container in accordance with claim **2** wherein said rim portion defines a continuous annular stacking ledge lying substantially in a plane perpendicular to the axis of said container.

4. An integral plastic container in accordance with claim **3** wherein said transverse bottom wall is upwardly domed.

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U.S. Cl. X.R.

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