Feb. 20, 1968 R. W. DIKE 3,369,688

BOTTLE CONSTRUCTION

Filed Aug. 8, 1966 2 Sheets-Sheet 1

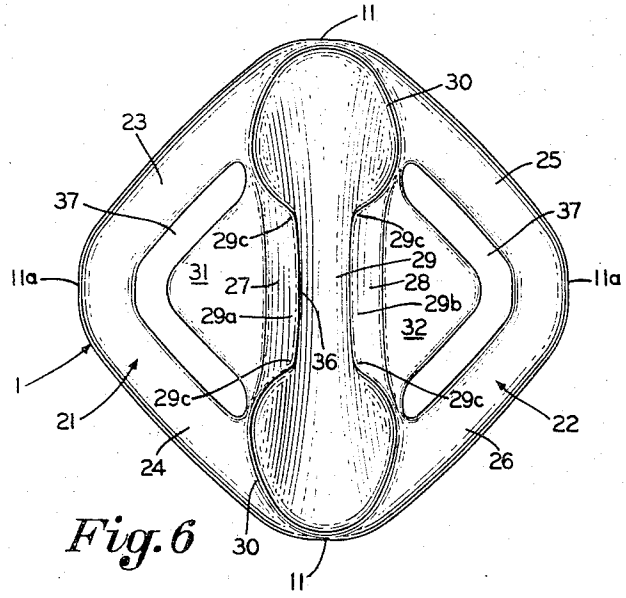


Fig. 6

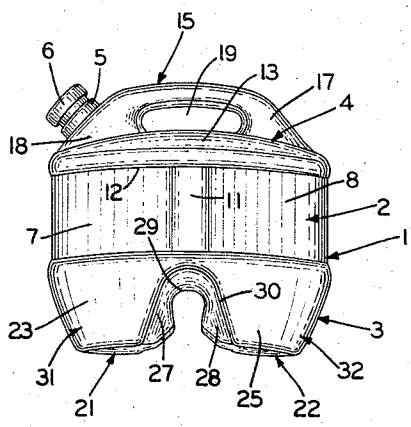


Fig. 1

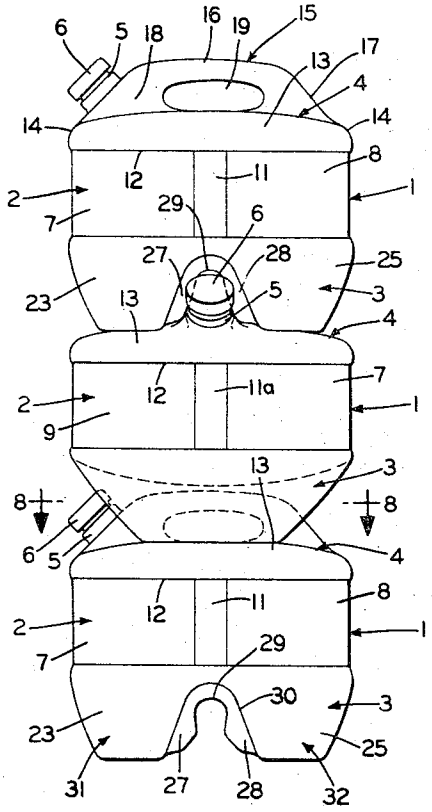


Fig. 7

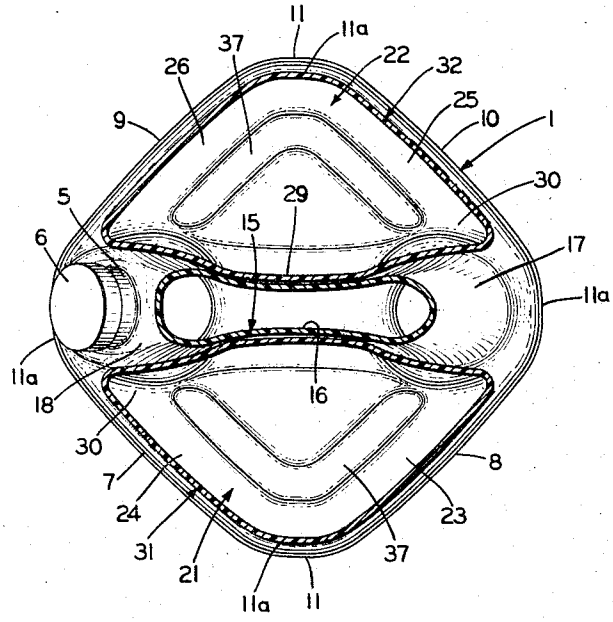


Fig. 8

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BOTTLE CONSTRUCTION

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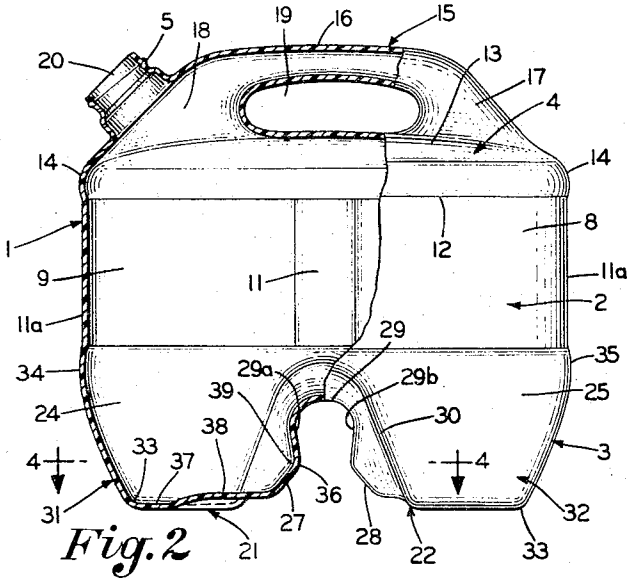


Fig. 2

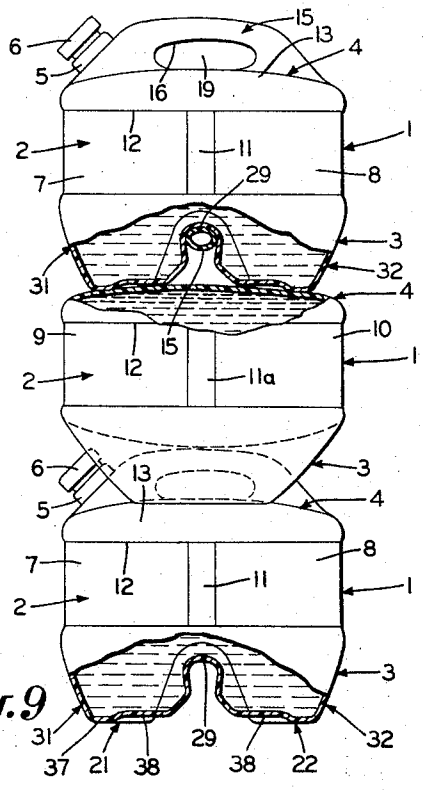


Fig. 9

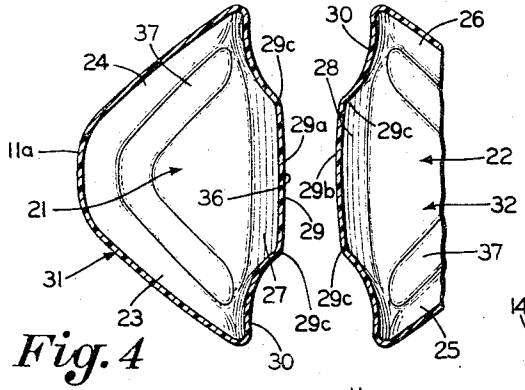


Fig. 4

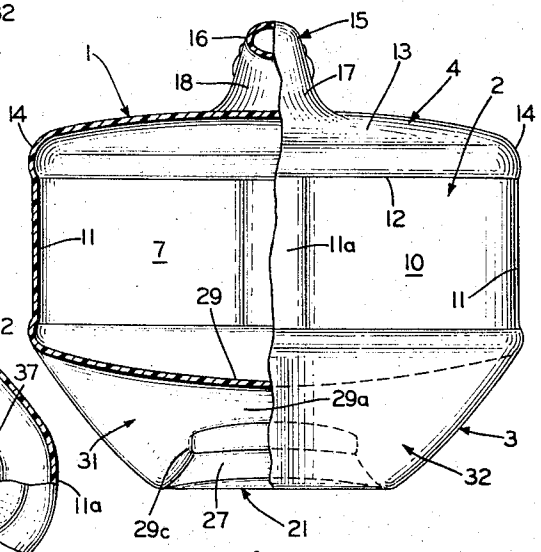


Fig. 3

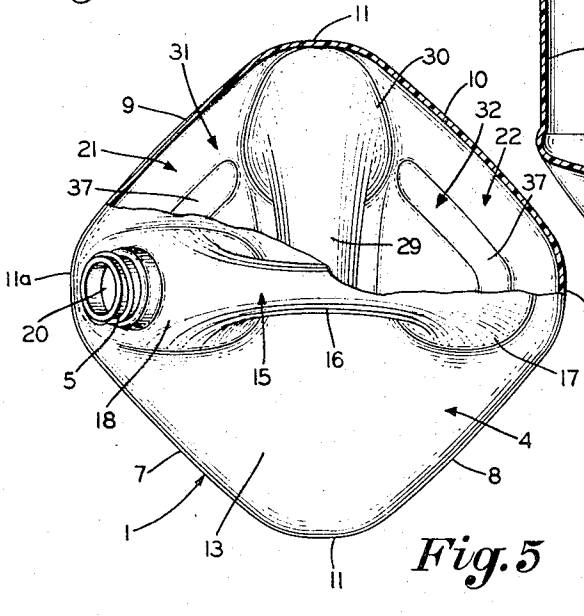


Fig. 5

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3,369,688

BOTTLE CONSTRUCTION

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Filed Aug. 8, 1966, Ser. No. 570,784
8 Claims. (Cl. 215—10)

ABSTRACT OF THE DISCLOSURE

A cube-shaped, flexible, plastic material bottle having generally rectangular vertically extending side walls, base wall and recess wall portions forming a diagonally extending bottom recess, the recess wall portions converging downwardly, a dome-shaped top wall and an upwardly projecting, diagonally disposed tubular handle member oriented 90° with respect to the diagonal bottom recess, the median zone of each recess wall portion having ends formed in horizonal cross section with shoulder abutments, each base wall having a relatively narrow outer marginal flat portion and a relatively wide inwardly, slightly upwardly inclined concave portion connecting the marginal flat portion and one of said recess median zones.

The invention constitutes improvements upon the bottom construction disclosed in my prior Patent No. 3,214,052, issued Oct. 26, 1965; and relates to bottles, jugs, containers and the like which may be used for the bottling, storage, distribution and use of various products, for example, liquids generally, and particularly the invention relates to a new bottle construction which may be used advantageously for the distribution of liquid cleaning products, such as bleaches, ammonia and the like, with a greater facility, efficiency, safeness and usability than prior art containers heretofore used for such purpose.

The bottle construction of my prior patent differs from prior bottle constructions for such purposes in that it eliminates the upwardly opening, usually central, filling and pouring nozzle, spout or neck, and eliminates other difficulties which have existed in connection with the use of such conventional bottles.

The patented bottle provides a hollow diagonally disposed handle upon the top of the bottle, and the filling and pouring nozzle, spout or neck is located in one end thereof. A diagonally disposed recess in the bottom of the bottle also is provided to receive the handle of a similar bottle when the bottles are stacked for display, storage or shipment.

However, it has been found that when such bottles are formed of flexible plastic material, the bottle walls may bulge and particularly the botttm wall of the bottle may bulge or become somewhat rounded downwardly when filled with liquid. This bulging or rounding of the bottom wall of the bottle may permit the bottle to rock when located on a horizontal surface, thus providing some instability when the bottles are stacked for shipping, display or distribution.

The patented bottle also had a downwardly and outwardly flared recess in its bottom surface to receive the handle of the next lower bottle when stacked in a nested stack. It was found that due to the flared shape of the recess there sometimes was a tendency for the bottles to be easily displaced laterally of the recess or handle when stacked in a nested stack.

Accordingly, objects of the invention are to provide a new compact bottle construction which eliminates the described difficulties encountered in the use of the patented bottles while retaining the benefits thereof; to provide a new bottle construction in which the bottom of the bottle is so shaped as to prevent bulging or rounding of the bottom surfaces when the bottle is filled with lqiud; to provide a new bottle construction incorporating a unique bottom wall structure, having a narow outer marginal flat portion for contact with a supporting surface with the remainder of the bottom wall of the bottle being inclined or recessed upwardly and inwardly; and to provde a new nesting, interlocking bottle structure in which the diagonally disposed recess in the bottom of the bottle, for receiving the handle of a stacked next lower bottle, is tapered downwardly and inwardly and is formed with end shoulders.

These and other objects and advantages, apparent to those skilled in the art from the following description and claims, may be obtained, the stated results achieved, and the described difficulties overcome, by the devices, constructions, structures, arrangements, combinations, parts and elements which comprise the present invention, the preferred embodiment of which—illustrative of the best mode in which applicant has contemplated applying the principles—is set forth in the following description and shown in the drawings, and which are particularly and distinctly pointed out and set forth in the appended claims forming part hereof.

The nature of the improved compact bottle construction of the present invention may be stated in general terms as including in a bottle of a type having blow-molded flexible plastic material side, bottom and top wall means integrally connected to form a generally cubically-shaped bottle, in which the side wall means includes generally rectangular vertically extendng side walls and connecting corners forming a generally square cross-sectional shape, in which the bottom wall means includes base wall, side wall and recess wall portions forming a bottom recess extending diagonally of the square between opposite side wall corners dividing the bottom wall means into two spaced leg cups each generally having a base formed by one of the base wall portions, in which the top wall means is formed with a dome-shaped top member and an upwardly projecting tubular handle means extending diagonally of the square between opposite side wall corners and oriented 90° with respect to the diagonal bottom recess, and in which the tubular handle member is outwardly and downwardly flared at each end and has a reduced central tubular handle portion spaced upwardly from the dome member to provide an elongated handle opening; the combination of bottom recess wall portions each having a median zone downwardly and inwardly tapered to form a keyhole-like shaped recess in vertical cross section, each median zone having each end formed in horizontal cross section with a shoulder abutment; and the base wall of each leg cup having a narrow, outer, marginal flat portion and an inwardly upwardly inclined concave portion connecting said margial flat portion and one of said recess median zones.

By way of example, an embodiment of the improved bottle construction is shown in the accompanying drawings forming part hereof in which;

FIG. 1 is a perspective view of the new bottle construction;

FIG. 2 is a vertical sectional elevation of the bottle upon a larger scale;

FIG. 3 is a vertical sectional elevation of the bottle taken at right angles to the plane of FIG. 2;

FIG. 4 is a horizontal sectional view taken on the line 4—4, FIG. 2;

FIG. 5 is a top plan view of the bottle with parts broken in section;

FIG. 6 is a bottom plan view of the bottle;

FIG. 7 is a view illustrating a plurality of bottles stacked in an interlocked nested stack; shown on a smaller scale;

FIG. 8 is a larger scale, horizontal sectional view taken on the line 8—8, FIG. 7; and

FIG. 9 is a view similar to FIG. 7 showing the bottles filled with liquid, parts being broken in section for the purpose of illustration.

Referring now more particularly to the embodiment of the invention illustrated in the drawings, in which similar numerals refer to similar parts throughout the various figures, the improved bottle construction is illustrated as comprising substantially a cube modified in the manner to be described to achieve the new concepts of the invention.

The bottle **1** may be made by usual blow-molded procedures preferably of flexible plastic material so as to be light in weight, strong, not readily breakable as is glass, and with a minimum tendency to mar, scratch or dent another object upon accidental contact therewith.

Although the bottle shape and the inter-related shape and arrangement of its components are of fundamental importance, the size of the bottle may be varied to provide bottles having various volumetric capacities such as one quart, one-half gallon and one gallon sizes.

The bottle **1** is formed of a number of integrally connected walls comprising side wall means generally indicated at **2**, bottom wall means generally indicated at **3** and top wall means generally indicated at **4**. The wall means **2**, **3** and **4** form a closed bottle or container having a filling and pouring neck **5** closed by a usual bottle cap **6**.

The side wall means **2** includes a plurality of generally rectangularly arranged, vertically extending side walls, **7**, **8**, **9** and **10** which are connected by rounded vertical corners **11** and **11***a* between adjacent side walls. Thus, the bottle **1** is generally square in cross section, as best illustrated in FIGS. 5, 6 and 8. The side walls **7**, **8**, **9** and **10** are preferably provided with a slight panel indentation **12** for receiving a label.

The top wall means **4** preferably includes a generally rectangular, convex, dome-shaped top member **13** connected by rounded corners **14** with the bottle side walls **7**, **8**, **9** and **10** and corners **11** and **11***a*. The top wall means **4** also includes an integral, tubular handle, generally indicated at **15**, extending diagonally between opposite side wall corners **11***a* and oriented 90° with respect to the diagonal bottom recess to be later described.

The tubular handle **15** has a reduced tubular median portion **16** terminating in outwardly, downwardly flared end portions **17** and **18** connected with the member **13** adjacent the bottle corners **11***a*. The reduced median handle portion **16** is spaced upwardly from the dome member **13** as shown, providing an elongated handle opening **19**.

As shown, the bottle filling and pouring neck **5** is connected with the flared handle end portion **18** and thus locates the pouring opening **20**, formed by the neck **5**, below the top of the handle member **15**.

As best shown in FIG. 8, the reduced median handle portion **16** of the handle has a smaller cross-sectional area than any portion of the handle **15** at either side of the center, above or beyond the handle opening **19**. The increasing size of the handle **15** at either side of the central portion **16** blends smoothly into the flared handle portions **18** and **19**.

The bottom wall means **3** preferably includes base wall portions, indicated generally at **21** and **22**, side portions **23**, **24**, **25** and **26**, and recess portions **27** and **28**. The recess portions **27** and **28** form a concave bottom recess **29** extending diagonally between opposite side wall corners **11**.

As best shown in FIG. 6, the recess **29** is of the smallest cross section at its center, being flared gradually outward on each side of the center and terminating in the enlarged end portions **30**, at opposite ends, adjacent the corners **11** of the bottle.

As best shown in FIG. 8, the recess **29** is of smallest cross section at its median portion and gradually increases in width toward each end in the same manner as the median portion of the handle **15**.

The recess **29** divides the bottom wall means **3** into two spaced leg cups, generally indicated at **31** and **32**, the leg cups being generally triangular in cross section as best shown in FIGS. 4, 6 and 8. The leg cup **31** has base wall portion **21** as its bottom wall, and side portions **23** and **24** and recess portion **27** as its side walls.

Leg cup **32** similarly has base wall portion **22** as its bottom wall, and portions **25**, **26** and **28** as its side walls. As shown, the cup side portions **23** and **24** and the enlarged recessed end portions **30** of the leg cup **31**, and the side portions **25** and **26** and the enlarged recessed end portions **30** of the leg cup **32** taper upwardly outwardly from the base wall portions **21** and **22** respectively, by slightly rounded corners **33** and **34**.

The side portions **23** and **24** of leg cup **31** connect with the bottle side walls **7** and **9** by slightly rounded corners **34**, and similarly the side portions **25** and **26** of the leg cup **32** connect with the bottle side walls **8** and **10**, by slightly rounded corners **35**.

Th side wall portions (FIGS. 2 and 4) of diagonal recess **29** have median zones **29***a* and **29***b* that converge downwardly and inwardly to form a keyhole-like shape for the recess **29** in vertical cross section as well shown in FIGS. 1, 2, 7 and 9.

These median zones **29***a* and **29***b* (FIGS. 4 and 6) have ends formed in horizontal cross section with a shoulder abutment **29***c*. The lower extremity of the keyhole-shape of recess **29** is narrowest at **36**, the width being slightly greater at this location than the width of the upper portion of handle **15** at any corresponding complementary portion (FIG. 8).

Thus, the shoulder abutments **29***c* of the bottom wall recess portion formation engage the flared handle portions **17** or **18** when a number of bottles are stacked one upon another and force is applied tending to slide one bottle laterally along the handle next below.

The bottom or base walls **21** and **22** of the leg cups **31** and **32** are formed with flat outer marginal V-shaped portions **37** around the outer edges of each base wall **21** and **22** (FIGS. 4, 6 and 8). Each base wall then is inclined gradually upwardly and inwardly to form a concave portion **38** which connects the marginal flat portion **37** through an abruptly upwardly and inwardly angled portion **39** at **36** with one of the median zones **29***a* or **29***b* (FIG. 2).

With this construction, when the bottle is empty, as shown in FIG. 2, only the narrow outer marginal flat portions **37** of the base walls **21** and **22** of the leg cups will contact with the floor or shelf or other surface by which it may be supported.

Even when the bottle is filled with liquid, as shown in FIG. 9, the weight of the liquid upon the base walls of the cup legs **31** and **32** will not bulge the inner portions **38** thereof downward sufficiently to contact the supporting surface therefor.

As best shown in FIG. 9, a plurality of the improved bottles, filled with liquid, may be stacked on one another to considerable height, without danger of the stack becoming unstable because of downwardly bulged or rounded bottom walls of the flexible bottles due to the weight of the liquid therein.

The improved bottle retains all of the benefits and advantages disclosed in my prior patent above referred to, and in addition the improved bottom wall and recess wall constructions avoid difficulties that have been encountered.

In the foregoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such terms are used for descriptive purposes and are intended to be broadly construed.

Moreover, the description and illustration of the invention is by way of example, and the scope of the invention is not limited to the exact structure shown, because the sizes and shapes of the bottle and its components may be varied to provide other structural embodiments, without departing from the fundamental principles of the invention.

Having now described the features, discoveries and principles of the invention, the construction, advantages and use of a preferred form thereof, and the advantageous, new and useful results obtained thereby; the new and useful discoveries, principles, devices, constructions, structures, arrangements, combinations, parts, elements, cooperative relationships, and mechanical equivalents obvious to those skilled in the art are set forth in the appended claims.

I claim:

1. In bottle construction of a type having blow-molded flexible plastic material side, bottom and top wall means integrally connected to form a generally cubically-shaped bottle, in which the side wall means includes generally rectangular vertically extending side walls and connecting corners forming a generally square cross-sectional shape, in which the bottom wall means includes base wall, side wall and recess wall portions forming a bottom recess extending diagonally of the square between opposite side wall corners dividing the bottom wall means into two spaced legs cups each generally having a base formed by one of the base wall portions, in which the top wall means is formed with a dome-shaped top member and an upwardly projecting tubular handle member extending diagonally of the square between opposite side wall corners and oriented 90° with respect to the diagonal bottom recess, and in which the tubular handle member is outwardly and downwardly flared at each end and has a reduced central tubular handle portion spaced upwardly from the dome member to provide an elongated handle opening; the combination of bottom recess wall portions each having a median zone downwardly and inwardly converging to form a keyhole-like shaped recess in vertical cross section.

2. Bottle construction as defined in claim 1, in which each median zone has ends and in which each median zone end is formed in horizontal cross section with a shoulder abutment.

3. Bottle construction as defined in claim 1, in which the base wall of each leg cup has a narrow, outer, marginal flat portion and an inwardly upwardly inclined concave portion connecting said marginal flat portion and one of said recess median zones.

4. Bottle construction as defined in claim 3, in which the outer marginal flat base wall portion is V-shaped.

5. In bottle construction of a type having blow-molded flexible plastic material side, bottom and top wall means integrally connected to form a generally cubically-shaped bottle, in which the side wall means includes generally rectangular vertically extending side walls and connecting corners forming a generally square cross-sectional shape, in which the bottom wall means includes base wall, side wall and recess wall portions forming a bottom recess extending diagonally of the square between opposite side wall corners dividing the bottom wall means into two spaced leg cups each generally having a base formed by one of the base wall portions, in which the top wall means is formed with a dome-shaped top member and an upwardly projecting tubular handle member extending diagonally of the square between opposite side wall corners and oriented 90° with respect to the diagonal bottom recess, and in which the tubular handle member is outwardly and downwardly flared at each end and has a reduced central tubular handle portion spaced upwardly from the dome member to provide an elongated handle opening; the combination of bottom recess wall portions each having a median zone, each median zone having ends, and each median zone end being formed in horizontal cross section with a shoulder abutment, the shoulder abutments being adapted to engage the flared end portions of the handle of a similar bottle.

6. Bottle construction as defined in claim 5, in which the base wall of each leg cup has a relatively narrow, outer, marginal flat portion and a relatively wide inwardly slightly upwardly inclined concave portion connecting said marginal flat portion and one of said recess median zones.

7. In bottle construction of a type having blow-molded flexible plastic material side, bottom and top wall means integrally connected to form a generally cubically-shaped bottle, in which the side wall means includes generally rectangular vertically extending side walls and connecting corners forming a generally square cross-sectional shape, in which the bottom wall means includes base wall, side wall and recess wall portions forming a bottom recess extending diagonally of the square between opposite side wall corners dividing the bottom wall means into two spaced leg cups each generally having a base formed by one of the base wall portions, in which the top wall means is formed with a dome-shaped top member and an upwardly projecting tubular handle member extending diagonally of the square between opposite side wall corners and oriented 90° with respect to the diagonal bottom recess, and in which the tubular handle member is outwardly and downwardly flared at each end and has a reduced central tubular handle portion spaced upwardly from the dome member to provide an elongated handle opening; the combination of bottom wall recess portions each having a median zone, and each leg cup base wall having a relatively narrow, outer, marginal flat portion, and a relatively wide inwardly, slightly upwardly inclined concave portion connecting said marginal flat portion and one of said recess median zones.

8. In bottle construction of a type having blow-molded flexible plastic material side, bottom and top wall means integrally connected to form a generally cubically-shaped bottle, in which the side wall means includes generally rectangular vertically extending side walls and connecting corners forming a generally square cross-sectional shape, in which the bottom wall means includes base wall, side wall and recess wall portions forming a bottom recess extending diagonally of the square between opposite side wall corners dividing the bottom wall means into two spaced leg cups each generally having a base formed by one of the base wall portions, in which the top wall means is formed with a dome-shaped top member and an upwardly projecting tubular handle member extending diagonally of the square between opposite side wall corners and oriented 90° with respect to the diagonal bottom recess, and in which the tubular handle member is outwardly and downwardly flared at each end and has a reduced central tubular handle portion spaced upwardly from the dome member to provide an elongated handle opening; the combination of bottom wall recess portions each having a median zone, and each leg cup base wall having a V-shaped narrow, outer, marginal flat portion, and an inwardly, upwardly inclined concave portion connecting said marginal flat portion and one of said recess median zones.

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DONALD F. NORTON, *Primary Examiner.*