

[54] BEER KEG

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[73] Assignee: **Huck Finn, Inc.**, Spring Lake Park, Minn.

[22] Filed: **Oct. 18, 1972**

[21] Appl. No.: 298,469

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Assistant Examiner—Steven M. Pollard

Attorney, Agent, or Firm—Dugger, Johnson & Westman

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 217,306, Jan. 12, 1972, which is a continuation-in-part of Ser. No. 58,341, July 27, 1970, abandoned.

[52] U.S. Cl. 220/1 R, 220/39 R, 220/70,
220/83

[51] Int. Cl. B65d 1/20

[58] **Field of Search** 220/1, DIG. 1, 3, 70, 72,
220/5 R, 27, 1 R

[56] **References Cited**

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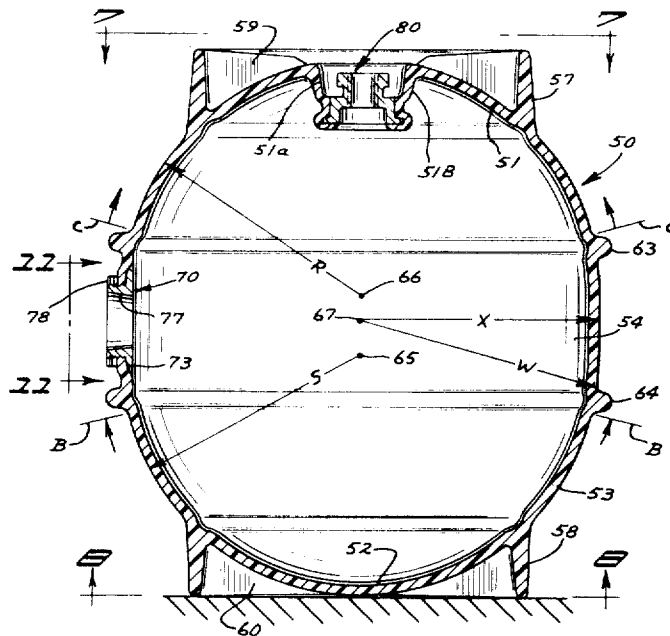
1,986,447 1/1935 Rishel 285/39

[57]

ABSTRACT

A beer keg having the top, bottom and side walls made of plastic, and tapper and filler plug mounting members made of plastic or metal which in one embodiment are cast in position as the top and side walls are formed. In the second and third embodiments, the filler plug mounting member is retained in the central part of the keg mold as the keg is molded and thereafter mounted in a filler opening formed in the keg.

14 Claims, 21 Drawing Figures



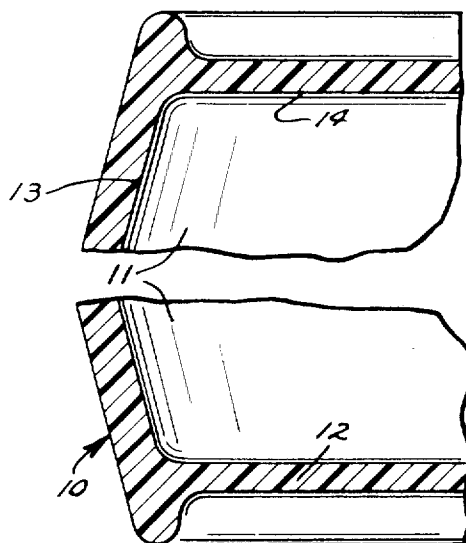
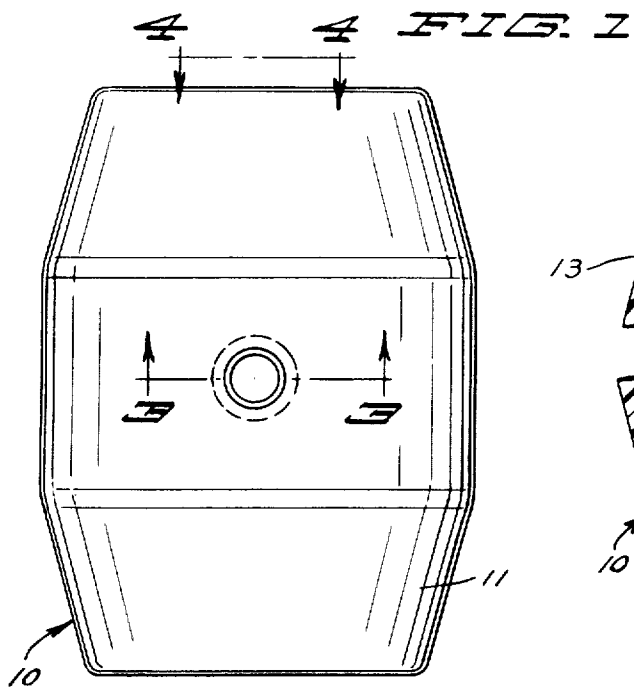


FIG. 2

FIG. 4

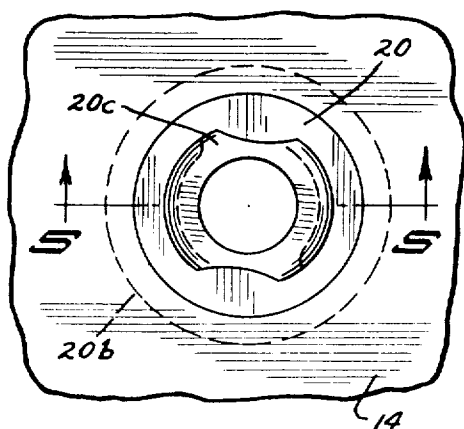


FIG. 3

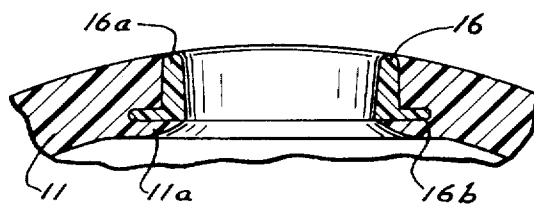
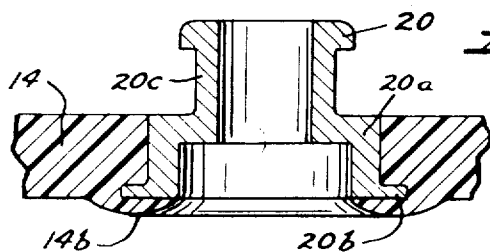


FIG. 5



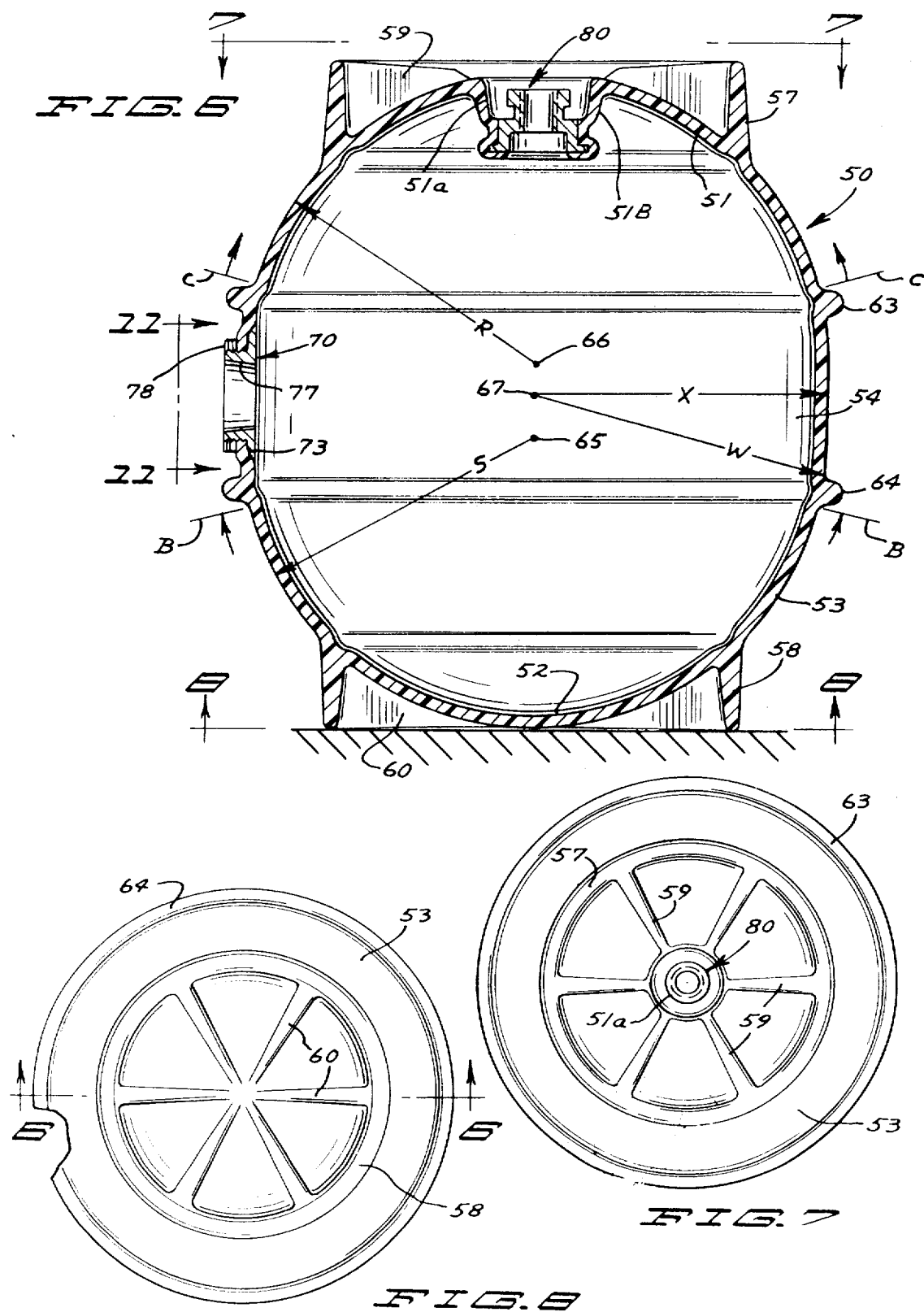


FIG. 9

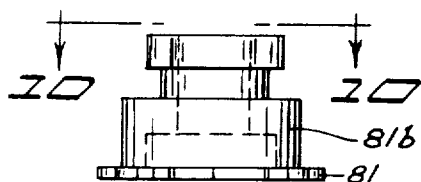


FIG. 10

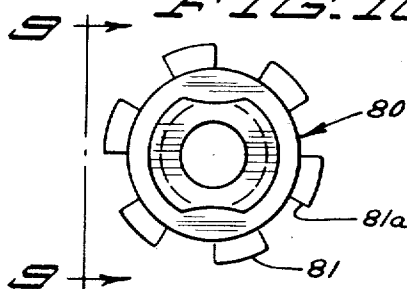


FIG. 11

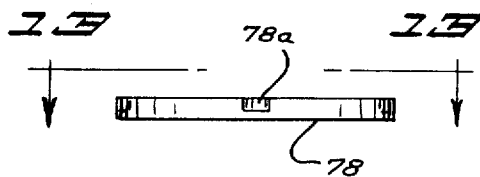
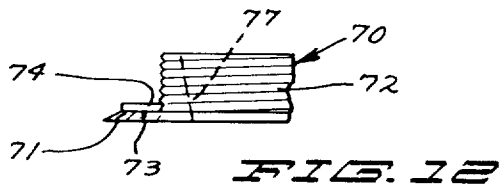
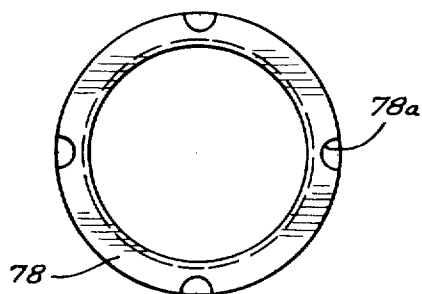
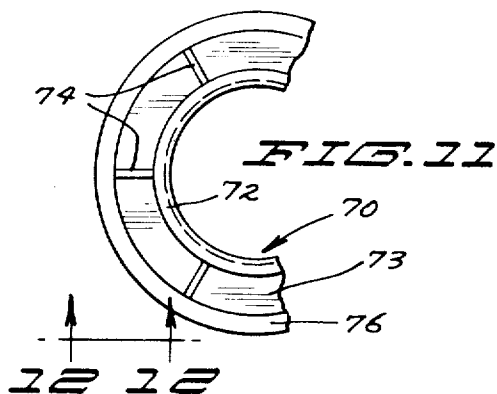


FIG. 14

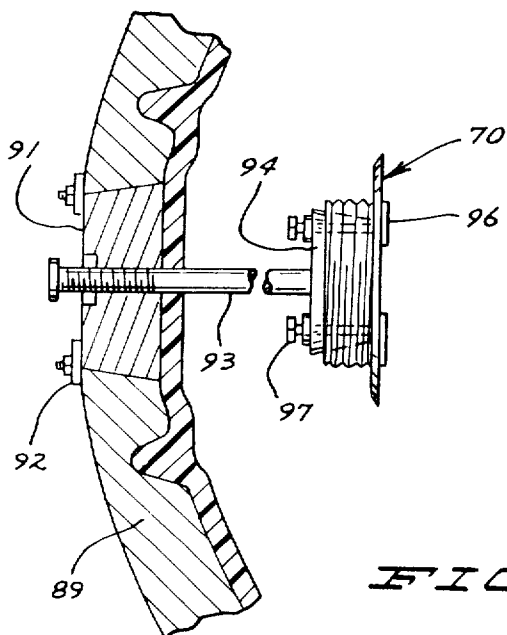


FIG. 15

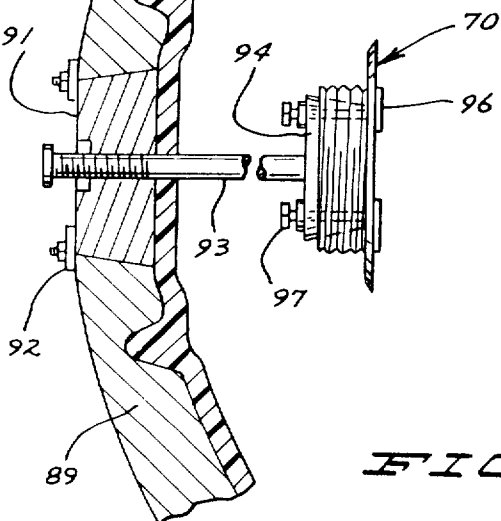


FIG. 16

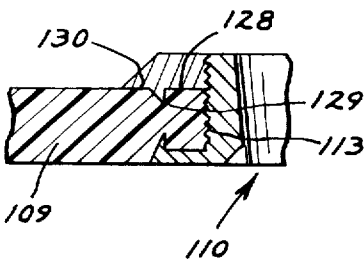


FIG. 18

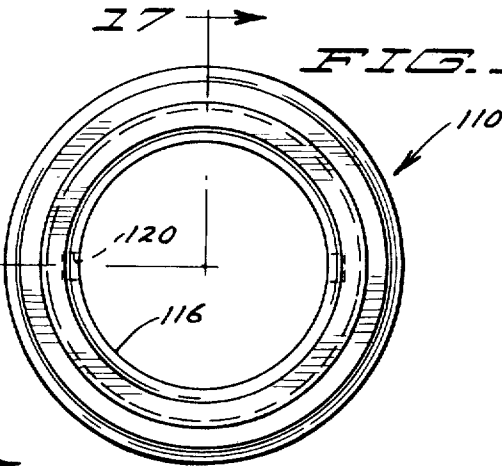


FIG. 19

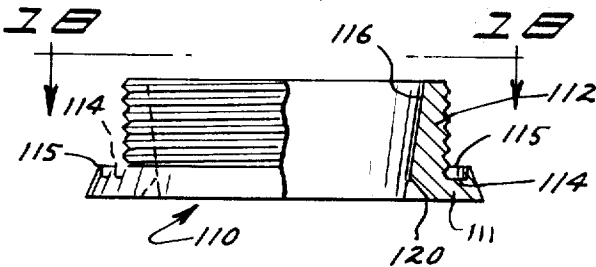
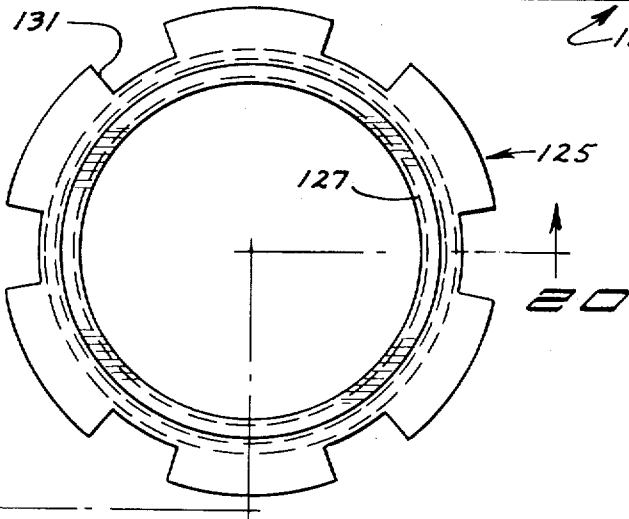


FIG. 17

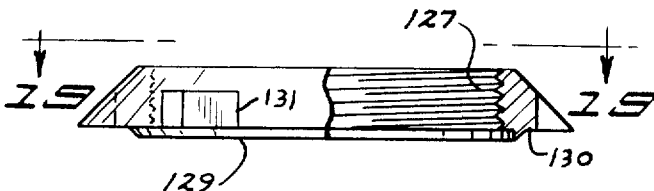


FIG. 20

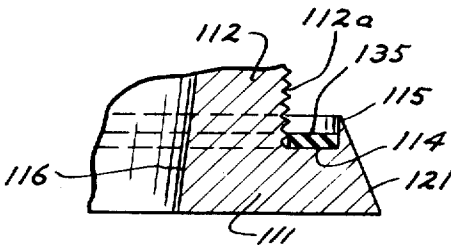


FIG. 21

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BEER KEG

RELATED APPLICATIONS

This application is a continuation-in-part application of my application Ser. No. 217,306, filed Jan. 12, 1972, which in turn is a continuation-in-part application of my application Ser. No. 58,341, filed July 27, 1970, now abandoned.

BACKGROUND OF THE INVENTION

A keg for beer. In the prior art it is old to make metal kegs, for example for aluminum for storing beer, and provide an opening in the side wall of the keg and in the top wall of the keg in which a filler plug mounting member and a taper plug mounting member are respectively subsequently mounted. However metal kegs are relatively heavy, relatively expensive to make, dent relatively easy and are noisy in handling. In U.S. Pat. No. 2,983,403 to Mauser there is disclosed a barrel for beer that includes a thin wall inner shell of metal or synthetic material that at the ends is provided with reinforcing rings, the shell and rings being covered by a layer 23 of synthetic material. However, such is not an integrally formed unit and not as economical to produce as desired. In order to overcome objections of the above mentioned nature, as well as others, the present invention has been made.

SUMMARY OF THE INVENTION

A beer keg having plastic top, bottom and side walls that are of integral unitary construction, and a taper mounting member cast in position in the top wall and a filler plug mounted in the side wall.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the first embodiment of the beer keg of this invention;

FIG. 2 is an enlarged fragmentary cross-sectional view of the beer keg of FIG. 1 showing the joining of the top and bottom walls to the side wall;

FIG. 3 is an enlarged fragmentary cross-sectional view generally taken along the line and in the direction of the arrows 3—3 of FIG. 1 to show the mounting of filler plug mounting member;

FIG. 4 is an enlarged fragmentary plan view generally taken along the line and in the direction of the arrows 4—4 of FIG. 1 to show the mounting of the taper plug mounting member;

FIG. 5 is a fragmentary cross-sectional view generally taken along the line and in the direction of the arrows 5—5 of FIG. 4;

FIG. 6 is a vertical cross-sectional view of the second embodiment of the beer keg of this invention, said view being generally taken along the line and in the direction of the arrows 6—6 of FIG. 8;

FIG. 7 is a top view generally taken along the line and in the direction of the arrows 7—7 of FIG. 6;

FIG. 8 is a bottom view generally taken along the line and in the direction of the arrows 8—8 of FIG. 6;

FIG. 9 is a side view of the taper plug mounting member, said view being generally taken along the line and in the direction of the arrow 9—9 of FIG. 10;

FIG. 10 is a top view of the mounting member of FIG. 9, and view being generally taken along the line and in the direction of the arrows 10—10 of FIG. 9;

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FIG. 11 is a fragmentary view of the filler plug mounting member of the second embodiment, said view being generally taken along the line and in the direction of the arrows 11—11 of FIG. 6;

FIG. 12 is a fragmentary view generally taken along the line and in the direction of the arrows 12—12 of FIG. 11;

FIG. 13 is a view of the retainer ring of the second embodiment that is generally taken along the line and in the direction of the arrows 13—13 of FIG. 14;

FIG. 14 is a side view of FIG. 13;

FIG. 15 is a fragmentary cross-sectional view showing the filler plug mounting member of the second embodiment mounted in the central portion of the keg as the keg is being formed;

FIG. 16 is a fragmentary cross-sectional view of the third embodiment of the invention;

FIG. 17 is in part a side view and in part a cross-sectional view of the filler plug mounting member of the third embodiment, said view being generally taken along the line and in the direction of the arrows 17—17 of FIG. 18;

FIG. 18 is a view of the filler plug mounting member of FIG. 17 that is generally taken along the line and in the direction of the arrow 18—18 of FIG. 17;

FIG. 19 is a view of the retainer ring of the third embodiment, said view being generally taken along the line and in the direction of the arrows 19—19 of FIG. 20;

FIG. 20 is in part a side view and in part a cross-sectional view of the retainer ring of FIG. 19, said view being generally taken along the line and in the direction of the arrows 20—20 of FIG. 19; and

FIG. 21 is an enlarged, fragmentary cross-sectional view of the mounting member and gasket thereon.

Referring to FIGS. 1—5, there is shown the first embodiment of the beer keg, generally designated 10, of this invention. The keg 10 includes an annular side wall 11, a bottom wall 12 and a top wall 14. The top and bottom walls are fixedly joined to the opposite ends of the side walls whereby there is provided a keg member 13.

In a central portion of the side wall there is provided an annular mounting member 16. Member 16 has a generally axially extending annular flange portion 16a that opens through the outer peripheral surface of the side wall and a radially extending, annular flange portion 16b having an outside diameter substantially greater than the outside diameter of flange portion 16a. The plastic material of the side wall surrounds the radially outwardly, axially extending surfaces of the mounting member in sealing engagement therewith. Further the side wall includes an annular portion 11a integrally formed with the adjacent portions of the side wall that covers a substantial part of the axially inner, radially extending surface of the mounting member. Thus, flange portion 16b, other than for its juncture to flange portion 16a, is embedded in plastic material on all sides thereof. The filler member 16 has a central aperture opening into the keg for filling the keg.

Mounted by the central portion of the top wall 14 is the taper plug mounting member 20. Tapper member 20 has an axially extending, annular flange portion 20a and a radially enlarged flange portion 20b integrally joined to the axially inner end of flange portion 20a. Thus the outer diameter of flange portion 20b is substantially larger than the outer diameter of flange por-

tion 20a. The plastic material surrounds and is in sealing engagement with the exposed outer peripheral surfaces of flange portions 20a, 20b and at least a substantial annular portion of the axial inner surface of flange portion 20b. As may be noted, plastic material 14b extends over the last mentioned surface. Thus the surfaces of flange 20b are covered by plastic material; i.e. flange 20b embedded in plastic. Member 20 has a central aperture opening into the interior of the keg. A pumping attaching portion 20c is joined to flange 20a to extend axially outwardly thereof, portion 20c having internal grooves (not shown) to have a taper plug (not shown) removably secured in portion 20c.

Referring to FIGS. 6-14, the second embodiment of the beer keg, generally designated 50, includes a top wall 51, a bottom wall 52 and a side wall 53 that is integrally joined to the adjacent edges of walls 51 and 52 respectively to form a keg chamber 54. A top annular flange 57 has its lower edge integrally joined to the top and side walls at the juncture thereof, the outer edge of flange 57 being at a substantially higher elevation than the maximum elevation of the top wall. Likewise, a bottom annular flange 58 has its top edge integrally joined to the bottom and side walls at the junction thereof, the lower edge of the bottom flange extending to a lower elevation than the lowermost part of the bottom wall.

Generally radially extending reinforcing flanges 59 are integrally joined to the top wall to extend thereabove and to flange 57 to extend radially inwardly thereof at a maximum elevation lower than the top edge of flange 57. Also radially extending reinforcing flanges 60 are integrally joined to the bottom wall to extend therebelow and to flange 58 to extend radially inwardly thereof at a minimum elevation above the bottom edge of flange 58.

Vertically spaced, exterior annular ribs 63, 64 respectively are integrally joined to the side wall, the ribs being of the same size. Other than for flanges 58, 60, the exterior surface of the bottom wall, and the adjacent part of the side wall that is below flange 64 has a radius of curvature R emanating from point 65, i.e. the portion arcuately from line B to line B, is in the shape of a portion of a sphere. Likewise, other than for flanges 57, 58 and the filler plug recess, the exterior surface of the top wall and the adjacent part of the side wall that is above the flange 63 has a radius of curvature S emanating from point 66. Vertically between and slightly closer to point 66 than point 65, there is a point 67, the horizontal dimension X from point 67 to the exterior surface of the sidewall being slightly greater than the dimensions of radii R, S; while the dimension W to the exterior surface adjacent the junctures of ribs 63, 64 respectively with the side wall (between the ribs) is slightly greater than the dimension X. Further the vertical distance from the top of rib 63 to point 66 is about one-third of the distance from the top of the rib to the bottom of the rib 64 while the corresponding distance of point 65 is about two-thirds of said distance between the ribs.

In the vertical central portion of the side wall (between ribs 63, 64), there is provided an annular plug mounting member, generally designated 70; that includes an annular flange 71 that is of a substantially larger outer diameter than the externally threaded reduced diameter annular flange 72 and integrally joined thereto. The flange 72 extends through a circular aper-

ture in the side wall portion while flange 71 has a generally flat annular surface 73 to abut against a flat annular surface of the interior surface portion of the side wall surrounding flange 72. A plurality of circumferentially spaced, radially extending teeth 74 are integrally joined to flange 71 to bite into the side wall to prevent the member 70 turning relative to the side wall. Member 70 has a frusto-conical plug receiving aperture 77 that is of progressively smaller cross-sectional areas in a direction toward the interior of the keg. Further, flange 71 has a tapered surface 76 extending between surface 73 and the axially opposite surface which forms a close fit with a corresponding surface of the side wall. A retainer nut 78 is provided to be threaded on flange 72 and abut against the exterior surface of the side wall to retain member 70 in position on the keg, member 78 having spaced wrench cutouts 78a.

Mounted by the top central portion of the top wall 51 is the taper plug mounting member, generally designated 80 (see FIGS. 9 and 10), that is of the same construction as mounting member 20 except that the radially enlarged flanged portion is provided with circumferentially spaced cutouts 81a that the plastic material of the keg extends into, to prevent rotation of member 80 relative to the keg. The top wall has a cylindrical recess 51a of a substantially larger diameter than the outer diameter of the annular flange portion 81b. The top wall has an inwardly protruding portion 51b that mounts member 80 with the top surface thereof recessed with reference to the continuation of exterior surface of the side wall in which recess 51a is formed. The same portions of member 80 are surrounded by plastic material of parts of portion 51a as the portions of member 20 that are surrounded by plastic.

Preferably a rotocasting process is utilized in making the kegs of this invention to provide kegs of a single layer of unitary, continuous walls of plastic joined to one another to enclose the keg chamber other than for the openings for members 16, 20 and 80. In order to mount the filler plug member 70 in place with the surface 73 abutting a corresponding interior annular surface of the side wall and without the opposite annular surface of flange 71 covered with plastic, the mold 89 used includes a tapered plug 90 having an inner flat surface of a larger area than the outer surface (see FIG. 15). Suitable attaching members 92 are provided for removably attaching the plug to the remainder of the mold whereby selectively the plug 90 is retained in a fixed position on the mold, and the mold may be removed from the keg while the plug 90 is not removed therefrom. An elongated rod 93 is mounted by plug 90 to extend radially inwardly to the central part of the mold, the inner end of the rod mounting a block 94 having a frusto-conical surface to form a close fit with the member 70 wall that defines the plug aperture 77. Latch members 96 are mounted by block 94 for releasably retaining member 70 on block 94 but which can be turned by turning bolts 97 to permit withdrawing the block 94 from member 70.

With powdered or granular uncured plastic material in the mold and mounting member 70 mounted in the central part of the mold by the above structure, the mold is simultaneously rotated about two axes and heated. During the rotation the plastic material adheres to the mold but not to block 94 or member 70 since they are too cool for the powder to adhere to. After the rotocasting step, the mold (other than for plug 91) is

removed from the keg, then rod 93 pulled radially outwardly an appropriate distance and thence an aperture cut in the keg side wall that is only slightly larger than flange 72. Next rod 93 is further radially moved to pull member 72 to extend outwardly of the keg, bolts 97 turned to release latches 96 and block 94 removed from member 70. Now the retainer nut 78 is threaded on flange 72 to draw radial teeth 74 into the keg side wall sufficiently that surface 73 forms a sealing fit with the side wall. The shape of the mold is such that during the casting step, the side wall adjacent plug 91 provides an inner keg surface that subsequently forms a tight fit with the filler plug mounting surface 76 including a recess into which flange 71 fits.

As an example of the invention and not otherwise as a limitation thereof, dimensions R and S may be 7-11/32"; dimension W 7-19/32"; dimension X 7-15/32"; the spacing of point 66 from point 65 1-7/8"; the spacing of point 67 from point 65 1-11/16"; and the maximum outer diameters of each of flanges 57, 58 5-11/32".

Referring to FIGS. 16-21, the third embodiment of the invention includes a keg that advantageously is of the same construction as the keg of the second embodiment and includes an annular plug mounting member, generally designated 110, that is mounted in the side wall 109 of the keg in the same place that plug 70 is mounted. Plug 110 has an annular flange 111 that is of a substantially larger outer diameter than the externally threaded reduced diameter annular flange 112, flange 112 being integrally joined to flange 111 to extend axially away therefrom. The flange 112 extends through a circular aperture 113 in the side wall while flange 112 has a generally flat annular surface 114 to abut against a flat annular surface of the interior surface portion of the keg side wall surrounding flange 112, provided no gasket 135 is provided. The axial length of flange 112 is substantially greater than the thickness of the keg wall portion defining opening 109. An annular tooth 115 is formed integral with flange 111, surrounds the flat surface 114, is triangular in cross section parallel to the central axis of bore 116 which extends axially through plug portions 111, 112, extends away from surface 114 in the same direction that portion 112 extends away from flange 111, and has an apex remote from surface 114. The threaded outer surface 112a of flange 112 is of generally circular cylindrical shape while the adjacent inner surface of tooth 115 is of a circular cylindrical shape. The radially outer surface of the tooth and flange 111 advantageously are co-extensive, frusto-conical and are tapered to extend radially inwardly in the direction flange 112 extends away from flange 111. The wall defining plug bore 116 is of a frusto-conical shape and has a major base remote from flange 111. Spaced notches 120 are provided in the interior surface portion of flange 111 that define the part of the bore extending therethrough to cooperate with projections on a tool for holding the mounting member in position in the aperture 113 while the retaining ring, generally designated 125, is being threaded thereon. As may be noted in FIG. 17, the notches 120 terminate adjacent the juncture of flange 111 to flange 112 whereby, when a plug is placed in bore 116, no fluid passageway is provided to permit fluid escaping through from the keg between the plug and mounting member. Further, the annular tapered surface 121 of flange 111 corresponds to surface 76 and functions in the same manner.

The retainer ring, generally designated 125, is of a unitary, integral construction and has an internally threaded bore 127, the threads of which form a mating fit with the threads of the outer surface portion of flange 112. Further, ring 125 has a flat annular surface 128, an annular tooth 129 having an apex edge remote from surface 128 that is of substantially the same shape and size as tooth 114, and an annular flat surface 130 surrounding tooth 129 and substantially coplanar with surface 128, tooth 129 being radially between surfaces 128, 130. The radially outer portion of the ring is provided with a plurality of wrench notches 131.

Advantageously a gasket 135 may be provided on the mounting member to abut against surface 114 and extend between surface 112a and the adjacent surface of tooth 115, the thickness of the gasket being substantially less than the axial height of tooth 115 (the maximum distance the tooth extends away from surface 114).

Preferably the method of making the third embodiment is the same as the second embodiment. The nut 125 is threaded onto the mounting member to tightly clamp the keg side wall portion that extends therebetween the teeth or locking flanges 115, 129 which extend toward one another to bite into the side wall portion. Thus, the locking flanges form annular depressions in the keg side wall portion with surface portions 128, 130, 114 abutting against the adjacent surfaces of the keg side wall portion, if no gasket is provided; or if a gasket is provided surface portions 128, 130 and the gasket abutting against the surfaces of the side wall portion. As a result of providing the teeth 115, 129 the side wall portion cannot pull away from the mounting member whereby fluid could leak between the side wall portion and the mounting member. It is to be mentioned the axial height of each of the annular teeth is many times less than the thickness of the wall portion that they protrude into.

The filler and taper plug mounting members of each embodiment advantageously may be made of metal, for example stainless steel or aluminum, or the same type of plastic that the walls of the keg are made of. In making the keg, the filler plug mounting members of the second embodiment and the taper plugs of both embodiments are mounted in position in the mold and then the walls of the keg are formed whereby said mounting members are at least partially embedded as above described. Preferably a rotocasting process is utilized in making the keg, and that the type of plastic used is a high-impact polyethylene.

By using preformed plug mounting members and at least partially embedding them during the wall forming process as referred to above, such that plastic material extends over both inner and outer surface portions (relative the keg), a good fluid seal is formed and the mounting members are firmly held in place. Further there is provided a durable, relatively light weight keg that can be used in the same manner as prior art kegs, but that is relatively inexpensive to produce. Additionally by making a keg of the shape of the second embodiment, it can be used for storing beer under higher pressure than the keg of the first embodiment that has the same wall thickness.

In each of the embodiments, the filler plug aperture may be modified for receivably retaining a twist-lock type of plug (not shown).

Further, with reference to the second and third embodiment, the retainer rings may be secured to the mounting member in a manner other than by threading. For example, the outer surface 112a and the inner surface 127 of the mounting member 110 and retainer ring 125 respectively may be smooth and form close mating fits, and with the thus modified retainer ring in position on the thus modified mounting member in clamping relationship to wall portion 109, the retainer ring is welded, riveted, swaged or otherwise fixedly mounted on the mounting member. Appropriate tools may be used to hold the retainer ring and mounting member tight clamping relationship to the keg wall portion 109 while they are fixedly secured to one another.

By making the kegs of plastic, they do not dent like metal barrels, and are much quieter when being handled, including during transport and filling operations.

What is claimed is:

1. A container for beer comprising a keg having unitarily continuous top, bottom and side walls of plastic defining a keg chamber, one of said walls having an opening therethrough that opens into the keg chamber and exterior and interior surfaces surrounding the opening, a mounting member mounted by the one wall to extend through the wall opening and having a central opening therethrough, said mounting member having a first annular flange extending through and outwardly of the wall opening and extending in close fitting relationship with the wall portion defining said opening, a second annular flange having an outer diameter substantially larger than the maximum outer diameter of the first flange, joined to the first flange and bearing against the wall interior surface, and a tooth joined to the second flange and protruding into the wall portion, and a retainer ring mounted on the second flange and bearing against the wall exterior surface to clamp the wall portion between said ring and first flange.

2. The apparatus of claim 1 further characterized in that the first flange extends axially away from the second flange, that the second flange has a surface portion adjacent the wall inner surface and that the tooth extends axially relative the second flange in the same direction as the first flange to a position more closely adjacent the retainer ring than the second flange surface portion.

3. The apparatus of claim 2 further characterized in that the tooth in cross section in a plane parallel to the central axis of the first flange is substantially triangular and has a terminal apex more closely adjacent the retainer ring than the second flange.

4. The apparatus of claim 2 further characterized in that there are provided a plurality of teeth joined to said second flange, said teeth being angularly spaced and extending radially relative the first flange.

5. The apparatus of claim 2 further characterized in that said tooth extends annularly and is of a substantially larger radius of curvature than the maximum diameter of the first flange.

6. The apparatus of claim 5 further characterized in that the second flange surface portion is annular and extends between the tooth and the first flange.

7. The apparatus of claim 6 further characterized in that the second flange surface portion bears against the wall interior surface.

8. The apparatus of claim 6 further characterized in that a gasket is provided between the second flange sur-

face portion and the keg wall inner surface, the axial height of the first flange being substantially greater than the tooth.

9. The apparatus of claim 6 further characterized in that the retainer ring has an annular tooth and an annular surface surrounded by the ring tooth that bears against the wall exterior surface, said ring tooth extending more closely adjacent the second flange than the ring annular surface.

10. The apparatus of claim 9 further characterized in that the retainer ring has a second annular surface surrounding the tooth, said ring annular surfaces being generally coplanar, the outer diameter of the second annular surface being substantially larger than the outer diameter of the second flange.

11. A container for beer comprising a keg having integrally joined top, bottom and side walls defining a keg chamber, said walls being made of unitary formed plastic, said side wall having a portion defining a plug mounting member opening and said top wall having a portion defining a taper plug mounting member opening, a filler plug mounting member mounted in the side wall opening by said side wall portion, and a taper plug mounting member mounted in said top wall opening in adhered relationship to the top wall portion, said filler plug mounting member having a first annular flange that has an annular surface bearing against the inner surface of the side wall, the first annular flange having an outer diameter greater than the side wall opening, and a second annular flange integrally joined to the first flange to extend outwardly through the side wall opening and having external threads, and a retainer nut threaded on the second flange to bear against the outer surface of the side wall, the first flange having a flat surface portion and a tooth extending axially relative the flat surface portion to a position more closely adjacent the nut than the flat surface portion.

12. A container for beer comprising a keg having unitarily continuous top, bottom and side walls of plastic defining a keg chamber, one of said walls having an opening therethrough that opens into the keg chamber and exterior and interior surfaces surrounding the opening, a mounting member mounted by the one wall to extend through the wall opening and having a central opening therethrough, said mounting member having a first annular flange extending through and outwardly of the wall opening and extending in close fitting relationship with the wall portion defining said opening, a second annular flange having an outer diameter substantially larger than the maximum outer diameter of the first flange, joined to the first flange and bearing against the wall interior surface, and a retainer ring mounted on the first flange and bearing against the wall exterior surface to clamp the wall portion between said ring and second flange, said ring having an annular tooth and an annular surface surrounded by the ring tooth that bears against the wall exterior surface, said tooth extending more closely adjacent the second flange than the ring annular surface.

13. The container of claim 12 further characterized in that the tooth has an apex edge remote from the annular surface.

14. The container of claim 12 further characterized in that said first flange and ring have threaded portions forming a mating fit.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,825,145

Dated July 23, 1974

Inventor(s) Richard W. Reynolds

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 13 "for" should be --of--;
Column 2, line 41 "walls" should be --wall--;
Column 2, line 41 "member" should be --chamber--;
Column 3, line 2 "wite" should be --with--;
Column 3, line 47 "the" should be omitted.

Signed and sealed this 8th day of October 1974.

(SEAL)

Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents