May 1, 1945. C. W. GIBBS 2,375,101

CONTAINER

Filed Aug. 6, 1943

Fig. 1.

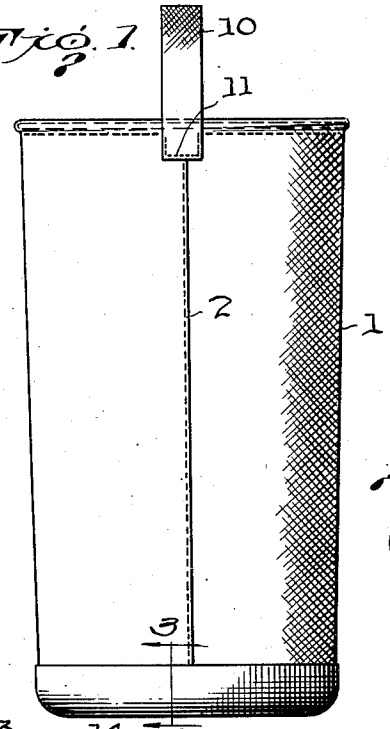


Fig. 2.

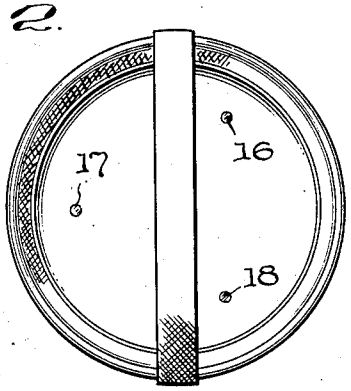


Fig. 4.

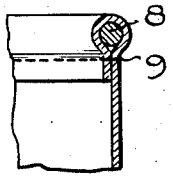
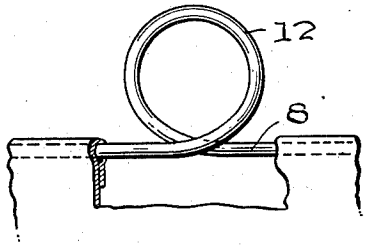


Fig. 5.



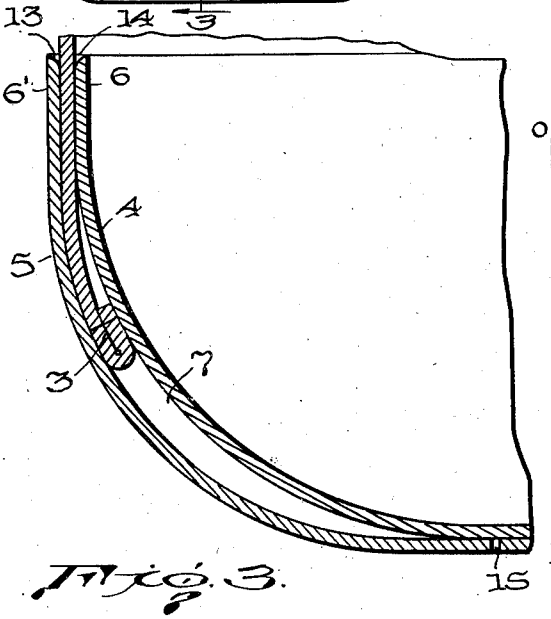
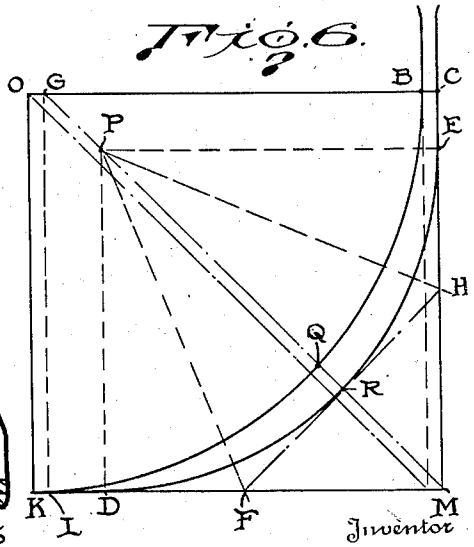


Fig. 3.

Fig. 6.



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UNITED STATES PATENT OFFICE

2,375,101

CONTAINER

Charles William Gibbs, Chevy Chase, Md.

Application August 6, 1943, Serial No. 497,655

5 Claims. (Cl. 150—50)

This invention relates to containers and it comprises a container having a tubular or cylindrically shaped body portion of flexible material such as waterproof fabric, canvas or the like, provided with a thickened or beaded lower end, and inner and outer substantially rigid cup-shaped members telescopically nested one within another with the lower end of the body portion fitting closely therebetween, said nested members defining an enlarged annular space therebetween for reception of the bead on the body portion, the bottoms of the cup-shaped members advantageously forming the bottom of the container and also advantageously secured together by spot welding, all as hereinafter more fully set forth and as claimed.

Heretofore the fabric side walls of such containers have been secured to metal bottom members by riveting or clamping the side wall to the bottom member. A common arrangement consists in forming a bead or thickened portion such as a hem on the lower end of the side wall and inserting the same in an annular peripheral groove or channel formed on the bottom member. The entrance to the channel is then closed by bending the side walls at the entrance together until they tightly engage and clamp the fabric therebetween. In other arrangements a wire or metal band is clamped or riveted through the fabric to the bottom member.

These prior constructions while providing containers useful in some relations have not proven generally satisfactory. Leakage and corrosion nearly always occur where rivets are used, and undue wear inevitably results where the metal of the bottom member clamps or is bent against the fabric.

It is an object of the present invention to provide an improved container of the type described which shall be strong and durable in use, capable of holding liquids without leakage and inexpensive and simple to manufacture.

A further object of the invention is to provide an improved joint for securing the fabric of the side wall to the metal bottom member.

A still further object of the invention is to provide an improved bottom member for such containers, the bottom member being formed of metal, plastic composition or other suitable substantially rigid material.

A still further object of the invention is the provision of a container of the character described composed of a few number of parts capable of assembly and dis-assembly by simply sliding one part over another or when assembled of being permanently secured in position without perforating or weakening the fabric.

These objects as well as others which will become apparent from the following detailed description of the invention are attained by means of the present invention, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing the advantages of the invention.

In the drawing:

Fig. 1 is a side view in elevation of the container of the present invention.

Fig. 2 is a top plan view of the container.

Fig. 3 is a detail vertical sectional view of the base of the container taken along line 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a detail vertical sectional view of the top edge and side wall of the container.

Fig. 5 is a detail view partly in section showing a modified construction for securing the handle to the top of the container, and

Fig. 6 is a diagrammatic view showing a preferred method of geometrically locating and designing the enlarged space for the fabric hem between the bottom cups.

Referring to the drawing wherein like numerals refer to similar parts throughout the several views, 1 is the body portion of the container which is formed of waterproof fabric or the like flexible material. As shown the body is tubular and is formed by overlapping and cementing or sewing two opposite ends of a rectangular piece of fabric together seam-like as at 2. While, as illustrated, the body is substantially cylindrical, it may be made in the form of a truncated cone or have other shapes. A small stitched hem 3 (Fig. 3) is provided at the bottom end of the tube to form a thickened or enlarged portion at this point. If desired a reinforcing member such as a wire or fabric cord (not shown) may be enclosed in the hem.

The bottom of the container is formed of two saucer or cup shaped members 4 and 5 respectively which are of the form of a disc curving off peripherally on a radius to terminate in a short cylinder 6—6' at right angles to the base. As stated, these members are formed of metal or plastic material or the like and are adapted to fit one within the other with their bottom walls in surface to surface contact and with the lower end of the fabric body portion sandwiched between the side walls of the members. For this purpose inner member 4 is constructed with a

cylindrical outside diameter equal to but not substantially greater than the inside diameter of the lower end of the fabric body portion, while the inside diameter of the outer member 5 is equal to but not substantially smaller than the outside diameter of the fabric body portion. Thus the cylindrical side walls of the cups, when the cups are nested or assembled with their side walls concentrically arranged, are spaced apart a distance equal to but preferably slightly less than the thickness of the fabric of the body portion above the hem. More or less frictional engagement or compression of the fabric between the side walls may be desirable depending upon the nature and texture of the fabric. To increase compression, the cups are constructed with diameters more nearly equal so as to provide a normal spacing of the side walls substantially less than the thickness of the fabric above the hem. Greater compression is desired when the fabric is composed of soft loose-woven material than when the material of the fabric is hard-spun and tightly woven. If desired, a waterproof cement may be applied to the fabric before the outer cup is slipped over the fabric on the inner cup. This will not only form a good seal and serve as an adhesive but will lubricate the surface and reduce the friction encountered in sliding the outer cup in place.

In order to accommodate the bead or hemmed lower end of the body portion, an enlarged space 7 is provided between the two cups at the points of curvature of the flat bottoms of the cups into the short upstanding cylindrical portions. This space may take substantially any form, such as an annular channel or indentation in the wall of one or both of the cups, and may be located between the side walls of the cups below their top edge or between the bottoms of the cups. A preferred construction consists in curving the bottom wall of the inner cup on a longer radius than the curvature of the wall of the outer cup as illustrated in Figs. 3 and 6 of the drawing. The maximum width of space 7 is advantageously not substantially greater than the thickness of the hem 3 or two and one-half times the thickness of the fabric.

As shown in Fig. 6, the rounded annular bottom portions of the cups intermediate the flat, disc-like bottoms and the short cylindrical side walls, are, in cross-section, curves of quadrants of large and small circles, respectively. The radius of curvature of the rounded, annular bottom portion or corner of the inner cup is somewhat dependent upon the characteristics of the fabric of the side wall of the container. Generally, if the fabric used is thin and flimsy, the corner can be made fairly sharp or in other words, the radius of curvature of the corner can be small. On the other hand, if the fabric is thick and stiff, a curvature of a larger radius is desirable.

One preferred method of obtaining the radius of curvature of the annular corner of the outer cup is illustrated in Fig. 6, wherein the arc B—K represents the curvature of the corner or bottom edge of the inner cup. As shown, curve B—K is the arc of quadrant B—O—K. To determine the center and radius of curvature of the bottom edge of the outer cup, radius line O—B is extended from B to C, as shown, a distance equal to the thickness of the fabric selected for the body of the container, and the distance B—C is laid off on O—B as shown at O—G. Using line G—C as one side, a square G—C—M—L is next drawn. The diagonal, G—M, of the square so formed is the center line of the arc of the bottom corner of the outer cup. From point Q, where the center line crosses arc BK, the distance Q—R, equal, advantageously to about two and one-half times the thickness of the fabric, is laid off on the line and at R a line is drawn at right angles to G—M which intersects lines L—M and C—M at F and H, respectively. Angles L—F—R and C—H—R are then bisected as shown and the point P on line G—M determined where these bisectors intersect. With point P then, as the center, and with the radius P—R, the arc D—R—E of the outer cup may be drawn.

Such construction is advantageous in that the approach of curves K—B and D—E toward each other at the top provides for extreme wedging of the hem on the lower end of the body portion and development of considerable friction and tightness between the cups when the fabric is pulled.

The body portion at the top is folded about a wire reinforcing ring 8 and stitched to itself as at 9. A fabric strap or handle 10 stitched to the top at each side as at 11 is provided for carrying the container.

In the modified handle construction shown in Fig. 5, wire ring 8 is formed with two upstanding diametrically opposite loops 12 which project above the top of the container for the purpose of attachment of a handle.

To permit ready assembly of the bottom cups to the fabric of the body portion and to decrease wear on the fabric at this point, the top edges of the cups are advantageously rounded off as shown at 13 and 14.

In one method of assembly of the container the inner cup is inverted and placed over a suitable mandrel. The tubular fabric body portion, also inverted, is next slipped down over the outside of the inner cup until the hem is positioned opposite the curvature on the bottom of the inner cup. The outer cup is then gently slipped or forced down over the fabric on the inner cup until the bottoms of the two cups lie in mutual contact. A small pinhole opening 15 is provided in the bottom wall of the outer cup to permit the air between the cups to escape during assembly. A slight downward pull or jerk on the fabric body portion wedges the hem 3 tightly between the walls of the cup after which pinhole 15 may be plugged by soldering to plug the hole or by spot welding the cups together over the hole. Additional spot welds may be provided, if desired, as at 16, 17 and 18. With this construction the more the pull on the fabric, as when material is placed in the container, the tighter the wedge or the joint and there is little or no tendency for the outer cup to slip off because of the absence of an entrance for air between the cups, because of the friction between the cups and, where the cups are spot welded, because of the spot weld.

If it is desirable to be able to disassemble the container for replacing the fabric body portion, spot welding of the cups together is dispensed with and the hole 15 reopened so as to admit air between the cups.

In actual practice, hole 15 may ofttimes be dispensed with depending upon the friction developed between the fabric and the cups and the character of the fabric used.

What I claim is:

1. A container comprising a flexible, tubular fabric body portion provided with a hem at one end and a pair of interfitting substantially rigid

cup-shaped bottom closure members each provided with a substantially cylindrical, vertically disposed side wall and a flat bottom wall, said side walls being adapted to engage and hold the hemmed end of said body portion wedged between them said cup-shaped members forming the bottom of the container, the outside diameter of the inner cup at the top being substantially equal to the inside diameter of the fabric body portion above the hem, the inside diameter of the outer cup at the top being substantially equal to the outside diameter of the fabric body portion above the hem, the side walls of said cup below their top edge defining an enlarged space for reception and retention of the hem.

2. A container comprising a tubular body portion formed of flexible fabric material and provided with a hem at one end, and inner and outer substantially rigid cup-shaped bottom closure members each provided with a substantially cylindrical, vertically disposed side wall and a substantially flat bottom wall, said members being telescopically nested one within the other with the hem provided end of the body portion fitting closely between said vertically disposed cylindrical side walls, said nested members defining an enlarged space therebetween for the reception of the hem, the bottoms of the cup-shaped members being advantageously in mutual surface contact and forming the bottom of the container.

3. The subject matter of claim 1 wherein the flat bottoms of said cup-shaped members are secured together by spot welding at said mutual surface to surface contact.

4. A container comprising a tubular body portion of fabric cloth material provided with a thickened portion adjacent its lower end, inner and outer substantially rigid cup-shaped members telescopically nested one within the other with their bottoms in substantially mutual surface to surface contact, the bottoms of said cup-shaped members forming the bottom of the container and being substantially flat and curving upwardly peripherally to form substantially vertical side walls, said radius of curvature of said inner cup being larger than the radius of curvature of said outer cup whereby a space is provided between said cups at said curved portions for receiving and entrapping the thickened portion on the lower end of the body during assembly of said cups to the body portion, the side wall of said cups above said space being spaced apart a distance substantially equal to but not greater than the thickness of the fabric of the body portion above the hem.

5. A fabric to metal joint comprising a hem formed on the edge of the fabric, a pair of inner and outer, cup-shaped metal members of curved, vertical cross-section adapted to fit substantially congruously one over the other with the hem of the fabric positioned therebetween, the curvature of said members being substantially arcs of circles drawn with different radii from centers off-set, the bottoms of said curves intersecting each other while the tops of said curves are spaced apart a distance equal to the thickness of the fabric beyond the hem whereby an enlarged space is formed between and approximately mid-way of the ends of said arcs for reception of the hem of the fabric, said members being engageable one within the other with the hem of the fabric positioned therebetween in said enlarged space by simply sliding said members one within the other whereby the hem is entrapped in the enlarged space and thereafter securing said metal members together.

CHARLES WILLIAM GIBBS.