

Aug. 3, 1954

W. B. KOCHNER

2,685,383

PRESSURE BULB CAP

Filed Sept. 20, 1952

FIG. 1.

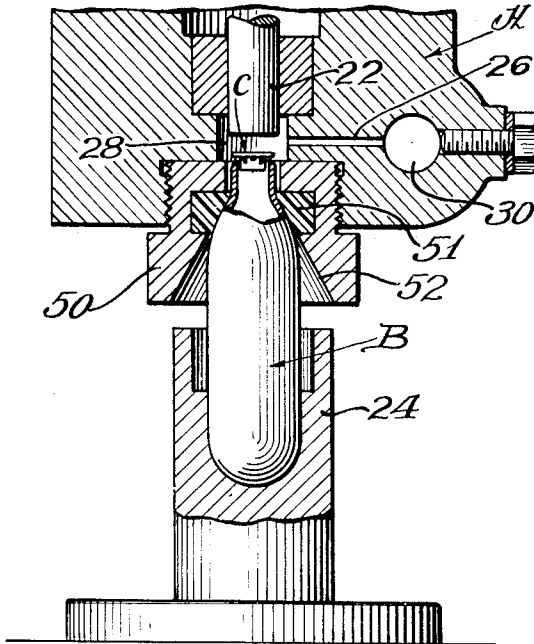


FIG. 2.

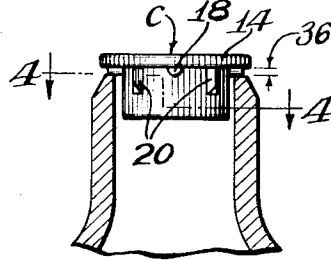


FIG. 3.

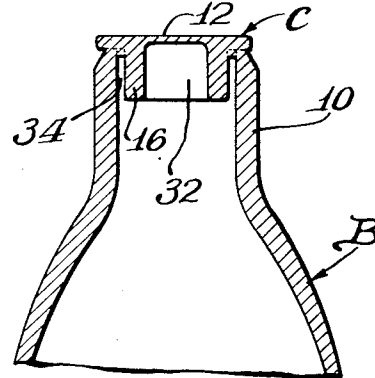


FIG. 5.

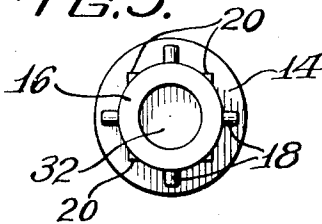


FIG. 6.

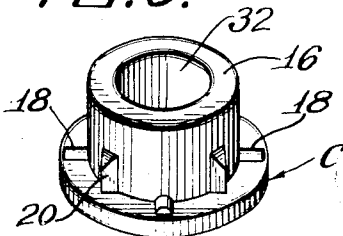
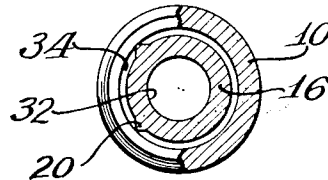


FIG. 4.



Inventor:
William B. Kochner;
By Bair, Freeman & Molinare
Attys

UNITED STATES PATENT OFFICE

2,685,383

PRESSURE BULB CAP

William B. Kochner, St. Louis, Mo., assignor to
Knapp-Monarch Company, St. Louis, Mo., a
corporation of Delaware

Application September 20, 1952, Serial No. 310,711

1 Claim. (Cl. 220—3)

1

This invention relates to a pressure bulb cap and particularly one that is to be welded to the neck of the pressure bulb. Pressure bulbs of the character disclosed may be of the "Sparklet" type such as shown in Weida Patent No. 2,425,448, and Tomasek et al, Patent No. 2,481,042. The Weida patent shows a cup-like cap over the neck of a pressure bulb; whereas Figure 5a of the Tomasek et al. patent shows one which is adapted to rest on the upper end of the neck and be welded thereto. The type of cap shown in this figure is pressed from sheet metal, but sometimes these caps fail to hold the pressure because the sheet metal is sharply folded upon itself.

It is, therefore, an object of my present invention to improve on the type of pressure bulb cap disclosed in the Tomasek et al. patent by "cold heading" the cap or cold forging it, thus eliminating the folding of sheet metal and the sometimes resultant fracture thereof.

A further object of the present invention is to provide a cap which will be accurately centered in relation to the neck of the bulb so that a flange on the cap does not project to one side of the neck and interfere with introduction of the capped pressure bulb into a holder of a syphon or the like.

Still a further object is to provide a cold-headed or forged pressure bulb cap provided with a flange and projections formed thereon to raise the flange above the upper end of the neck of a bulb so that the bulb can be properly charged with CO₂ or other gas when in a charging and welding chamber of an apparatus for charging and sealing metallic bulbs of the character disclosed in the Tomasek et al. patent.

An additional object is to provide projections on the side wall of the pressure bulb cap to center it accurately in relation to the interior of the neck of the pressure bulb so as to avoid dislocation of the cap when the gas is being introduced into the bulb.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my pressure bulb cap, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim and illustrated in the accompanying drawings, wherein:

Figure 1 is a cross-sectional view through a pressure bulb and a charging and sealing head therefor with one of my pressure bulb caps mounted on the bulb during the charging operation.

Figure 2 is an enlarged sectional view of the

2

neck of the bulb and a side elevation of my pressure bulb cap resting thereon.

Figure 3 is a similar view entirely in section showing the cap after it is welded in position.

Figure 4 is a horizontal detail sectional view on the line 4—4 of Figure 2.

Figure 5 is a bottom plan view of my pressure bulb cap; and

Figure 6 is a perspective view thereof with the cap inverted.

On the accompanying drawing I have used the reference character B to indicate in general a pressure bulb of the "Sparklet" type and H the head of a charging and sealing apparatus therefor. The charging and sealing apparatus is shown in detail in the Tomasek et al. patent hereinbefore referred to and includes a bulb seat element 24 and a sleeve 50 which has a cone-shaped entrance bore 52 to guide the bulb into the sleeve and against an insert 51 therein of Bakelite or the like for sealing purposes. The sealing is accomplished with respect to a pressure chamber 28 to which pressure may be introduced through a passageway 26 from a passageway 30 in the head H.

Slidable in the head H is an electrode 22 adapted to subsequently be lowered against my pressure bulb cap shown generally at C. The bulb seat element 24 constitutes a second electrode so that when current is passed between 22 and 24, it will weld the cap C to the bulb B as shown in Figure 3.

The present invention relates particularly to the construction of the cap C which is adapted to enter the neck 10 of the bulb B and to also cover the neck. The cap C is inverted cup-shape having a relatively thin wall 12 adapted to be pierced by a piercing pin when the bulb is subsequently introduced into a syphon or the like. The cup is further defined by an annular wall 16 which is relatively thick, the dimensions being illustrated in Figure 3.

The cap C is formed by a "cold-heading" operation from wire stock of suitable size and the cold-heading or forging dies form the relatively thick wall 16 as well as the relatively thin wall 12. They also form a flange 14 around the wall 16 and in line with the wall 12 as illustrated and additionally form projections 18 on the flange 14 and projections 20 on the outside of the wall 16.

When the cap C is placed in the neck 10 of the bulb B as shown in Figure 2, the projections 18 space the flange 14 from the upper end of the neck 10 as shown by the dimension indicated at

36 in Figure 2. At the same time the projections 20 space the annular wall 16 from the interior of the neck 10 equally all the way around the wall and neck as shown particularly in Figure 4. Thus the projections 18 and 20 cooperate to provide passage for the charging gas from the passageway 26 through the pressure chamber 28 and into the bulb.

After the desired quantity of gas has been introduced into the bulb under pressure in this manner, the gas is cut off beyond the passageway 30 and the electrode 22 lowered into contact with the cap C. Electric current is then passed between the electrode 22 and the bulb seat 24 for heating the contacting parts (upper end of neck 10 and lower surfaces of projections 18) so that these contacting parts are heated and under further pressure and movement of the electrode 22 downwardly, the bottom of the flange 14 finally engages the upper end of the neck 10 and a welding operation is effected between these two surfaces so that in effect the cap C and the bulb B become integral as indicated by the cross sectioning in Figure 3.

During the welding operation the projections 20 serve the further purpose of keeping the cap C centered in relation to the neck 10 of the bulb B so that the periphery of the flange 14 does not project at one point or another beyond the circumference of the neck and thus interfere with the introduction of the bulb subsequently into a bulb holder.

From the foregoing specification, it will be obvious that I have provided a pressure bulb cap which is an improvement over the type shown in the Tomasek et al. patent. It is also an improvement over the Weida patent above referred to in that it does not enlarge the diameter of the neck 10 by having a side wall surrounding the neck. At the same time the construction is such that even though the bulb cap is of intricate shape, it is readily formed of suitable steel in cold-heading forming dies, without introducing any weak spots which might leak as disclosed in the type of cap shown in Figure 5a of the Tomasek et al. patent.

Some changes may be made in the construction and arrangement of the parts of my pressure bulb cap without departing from the real

spirit and purpose of my invention, and it is my intention to cover by my claim any modified forms of structure or use of mechanical equivalents which may be reasonably included within its scope.

I claim as my invention:

In a welded fluid pressure bulb and cap structure, a container of resistance weldable metal having a tubular filling neck, and a closure cap of resistance weldable metal having a top wall of sufficient diameter to at least partially overlie the upper end of said neck, a solid depending tubular wall of substantially less external diameter than the internal diameter of said neck, said top wall, within the limits of the internal diameter of said depending tubular wall, being thinner than the remainder thereof to facilitate puncture thereof, and means to space the portion of said top wall overlying said neck and the outer surface of said depending tubular wall from the upper and inner surfaces respectively of said neck comprising at least three ribs on the under surface of said top wall and at least three ribs on the outer surface of said depending tubular wall, said first ribs being relatively thick and narrow so that the spaces between successive ribs and between said neck and said upper wall provide for free flow of the fluid with which said container is to be filled and said second ribs provide spaces between said tubular wall and said neck to thereby permit ready entrance of such fluid into said container while said closure cap is positioned thereon prior to being welded thereto, said first ribs, due to the relative narrowness thereof, being readily depressed into said neck and fused therewith upon welding said closure cap to said container and resulting in a continuous circular seal between the two.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,249,532	Smith et al.	Dec. 11, 1917
2,184,939	Green	Dec. 28, 1939
2,481,042	Tomasek et al.	Sept. 6, 1949
2,558,723	Ayres	July 3, 1951