

[54] SAFETY CLOSURE CAP

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[52] U.S. Cl. .... 220/40 R, 220/24 C, 220/24 GT

[51] Int. Cl. .... B65d 5/02, B65d 5/42

[58] Field of Search ..... 220/40 R, 40 S, 24 C, 220/24 GT; 215/50

[56] References Cited

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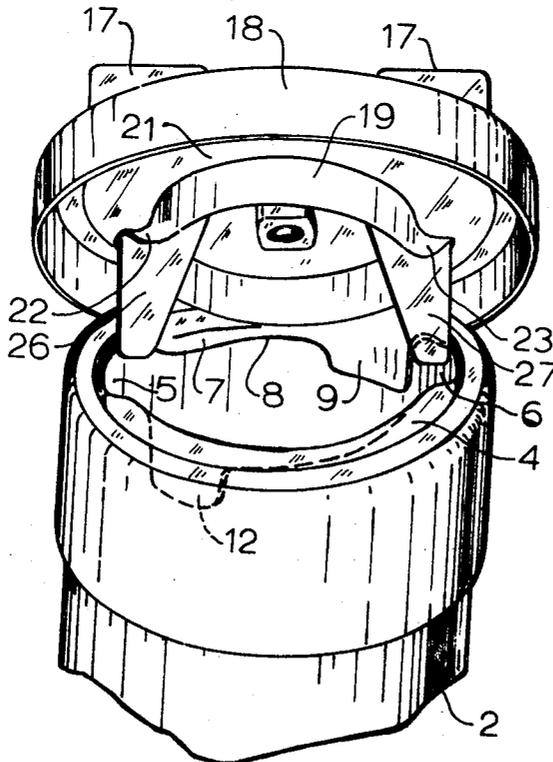
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Assistant Examiner—Allan N. Shoap  
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[57] ABSTRACT

A safety closure cap for bayonet connection with a spout, wherein latching lugs on the cap insertable through bayonet notches in the spout and latching is effected upon turning of the cap, is provided with elongated blocking prongs extending downwardly from and rigid with the lugs which prevent turning of the cap unless the cap is fully seated on the top of the spout.

8 Claims, 13 Drawing Figures



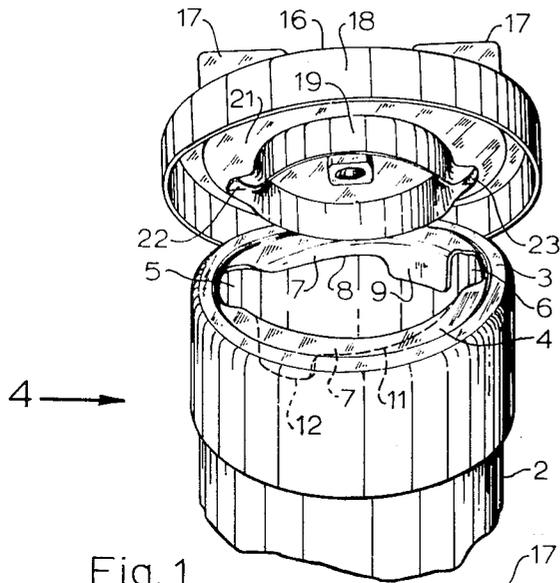


Fig. 1

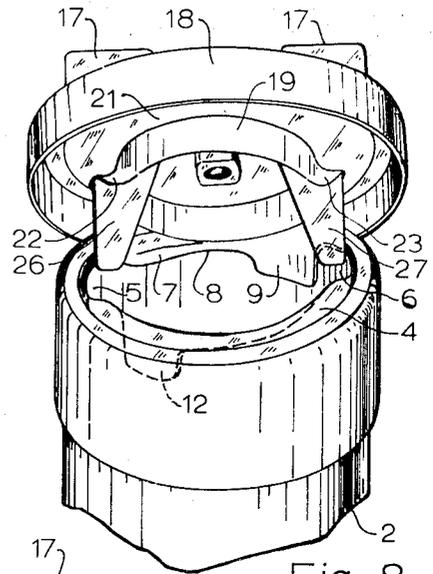


Fig. 8

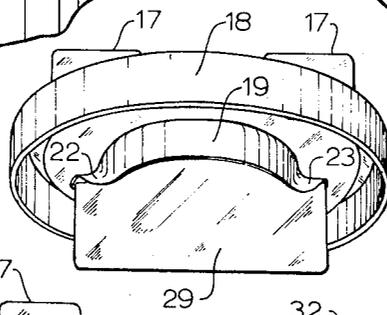


Fig. 13

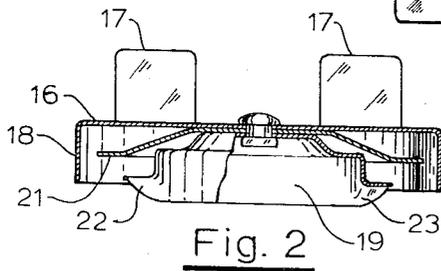


Fig. 2

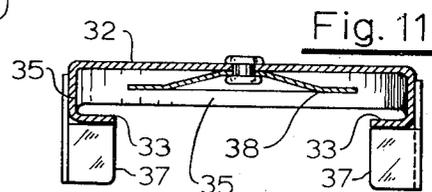


Fig. 11

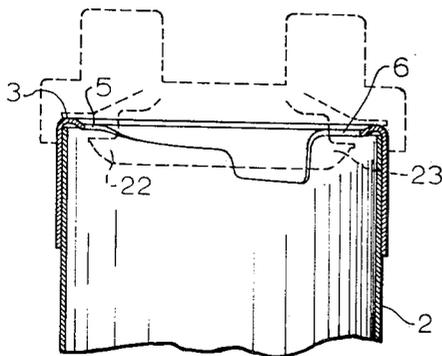


Fig. 3

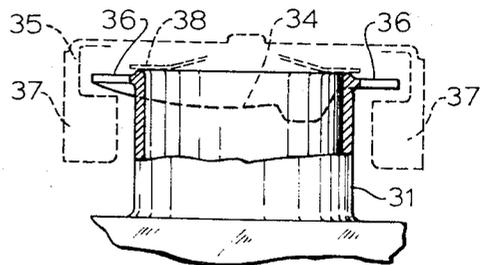


Fig. 12



**SAFETY CLOSURE CAP**

This invention relates to a safety closure cap for bayonet connection with a spout, and more particularly to such type of cap wherein means is provided to insure that the cap is evenly seated on the top of the spout before it can be turned to close or seal the same.

**BACKGROUND OF THE INVENTION**

A common type of closure cap for filling spouts on automobile gasoline tanks is adapted for bayonet connection with such filling spout. The filling spout comprises a top and diametrically opposite female notches adjacent the top through which latching lugs on the cap are insertable to provide a bayonet type connection upon turning of the cap over the top of the spout. Opposite cam surfaces are provided on the spout, each of which extends from and slopes downwardly from adjacent the end of a notch and terminates adjacent a downwardly extending stop. A spring pressed sealing disc is provided in the cap and upon twisting or turning (provided the latching lugs are inserted properly through the notches) the cap becomes securely and fully seated with the sealing disc tightly engaged in sealing contact with the top of the spout.

Gasoline station attendants are sometimes careless in applying the closure cap to the spout after the tank has been filled with gasoline. Instead of insuring that both of the latching lugs are properly inserted into the female bayonet notches, only one latching lug is so inserted and the other opposite latching lug merely rests or engages the top of the spout. Latching is thus effected by only one lug and the cap is seated with a tilt. As a result, the closure cap is not fully or evenly seated on the top of the spout so that when the cap is twisted to latch the same, an open space obtains at the upwardly tilted side of the cap which allows vapor and gasoline to escape grossly from the spout, especially when the vehicle is accelerating, thus creating a dangerous situation.

**SUMMARY AND OBJECTS**

Summarizing the invention hereof, it overcomes the foregoing problem by the provision of means in the form of blocking prongs which extend downwardly from the latching lugs of a conventional bayonet type closure cap, which insure that the cap becomes fully seated on the top of the spout before it can be turned to latch the same. These blocking prongs are made sufficiently long so that when only one of the prongs is inserted through a female notch of the spout and the cap is at an angle, the other blocking prong will engage an edge of the opposite notch of the spout and prevent turning of the cap unless it is fully seated on the rim of the spout.

From the preceding, it is seen that the invention has as its objects, among others, the provision of economical and simple means on a bayonet type connection, closure cap, which will insure that the cap is fully seated on a spout before it can be latched, to thus prevent escape of contents from the spout, which would otherwise occur if the cap is not sealed to the top of the spout. Other objects of the invention will become apparent from the following more detailed description and accompanying drawings in which:

**DESCRIPTION OF THE DRAWINGS**

FIG. 1 is an exploded perspective view of a common

type of closure cap and filling spout of an automobile gasoline tank;

FIG. 2 is a vertical section through the cap of FIG. 1;

FIG. 3 is a sectional elevation illustrating the cap of FIG. 1 in phantom lines seated properly on the top of the spout;

FIG. 4 is a vertical sectional elevation looking in the direction of arrow 4 in FIG. 1, with the cap fully seated after having been twisted 90° from the position shown in FIG. 3;

FIG. 5 is a horizontal sectional elevation, looking upwardly in the direction of arrow 5 in FIG. 7, of the top portion of the filling spout and the cap, illustrating the improper situation where only one latching lug has been properly inserted through an associated notch in the spout with the diametrically opposite latching lug resting on the top of the spout;

FIG. 6 is a view similar to FIG. 5, but illustrating the cap turned 90° from the position shown in FIG. 5, wherein it should normally be latched fully but is not so latched;

FIG. 7 is a fragmentary sectional elevation illustrating the tilted position of the cap when it is not properly latched because of the situation shown in FIG. 6, portions of the view being shown broken away for clarity;

FIG. 8 is a view similar to FIG. 1, but illustrating how the conventional cap of FIG. 1 is provided with blocking prongs extending downwardly from the latching lugs to accomplish the purposes of this invention;

FIG. 9 is a view similar to FIG. 5 illustrating how the blocking prongs of this invention prevent closing or latching of the cap unless it is properly seated on the top of the spout;

FIG. 10 is a sectional elevation illustrating how blocking by one of the blocking prongs shown in FIG. 9 is effected;

FIG. 11 is a vertical section of another embodiment of the instant invention wherein the closure cap is adapted for an external type bayonet connection;

FIG. 12 illustrates in vertical section a type of external connection on a filling spout, the cap being shown seated in phantom lines and;

FIG. 13 is a perspective view of the underside of the closure cap illustrating a modification wherein the blocking prongs are ends of an integral fin.

**DETAILED DESCRIPTION**

For purposes of reference in the following description, the positions of the parts are referred to considering the top of the spout and the cap as the uppermost parts, although it is to be understood that the spout and cap may be arranged, for example, horizontally, depending upon the environment wherein the spout is employed.

Referring to FIGS. 1 through 7 for purposes of explanation of the invention, a conventional filling spout and a conventional type of closure cap for the gasoline tank of an automobile are illustrated. These parts which are adapted for a bayonet type connection, comprise an upwardly extending tubular filling spout 2, having a top comprising rim 3, and horizontal flange 4 extending inwardly and substantially even with rim 3. Diametrically opposite notches 5 and 6, which provide for a bayonet connection, are formed in flange 4 which has a downturned flange 7 on each side of the spout extending between notches 5 and 6. The under edge of one of downturned flanges 7 forms a cam surface 8, which extends

from an edge of notch 5, slopes gradually downwardly and terminates adjacent a downwardly extending stop 9 at opposite notch 6. A like cam surface 11 and stop 12 are formed in the opposite flange 7, with cam surface 11 opposite cam surface 8 and stop 12 opposite stop 9.

The conventional cap for cooperation with the described spout comprises a flat top 16 having diametrically opposite upright lugs 17 for grasping to turn the cap on the spout, and a downwardly extending cylindrical flange 18 which fits over the spout. A centering hub 19 is secured to the underside of cap top 16; and a spring pressed sealing disc 21 is fixedly secured between the cap and the centering hub 19. Centering hub 19 has opposite outwardly extending latching lugs 22 and 23 stamped integral therefrom. Except for the outwardly projecting lugs 22 and 23, hub 19 is cylindrical and is adapted to fit between the aforementioned downwardly extending flanges 7.

When latching lugs 22 and 23 are inserted through notches 5 and 6, and the cap is twisted or turned 90° from the position shown in FIG. 1, tight sealing action is effected by the latching lugs 22 and 23 riding over cam surfaces 8 and 11, respectively, to the fully latched position where the lugs engage stops 9 and 12. Because of the pressure applied against sealing disc 21 by the camming action, the sealing disc becomes tightly pressed against the top of the spout, as illustrated in FIG. 4, so that the cap is sealed against the top of the spout. This position is shown in FIG. 4; and FIG. 3 illustrates in phantom lines proper initial positioning of the cap wherein both latching lugs 22 and 23 are properly inserted through the bayonet notches 5 and 6, respectively, whereby after the cap is twisted 90°, a tight seal can be effected against the top of the spout.

As can be seen from FIGS. 5 and 6, notches 5 and 6 of the aforesaid conventional cap are relatively wide compared to the width of the single pair of opposed latching lugs 22 and 23 located only at substantially the same level. They and spring pressed sealing disc 21 provide an initial loose fit to thus enable quick attachment of the cap without exact fitting thereof on the spout. Also cam surfaces 8 and 11 are relatively shallow. As a result of this loose fit, as can be seen from FIGS. 5, 6 and 7, it will be noted that it is possible for a person to inadvertently tilt the cap as shown in FIG. 7, and carelessly insert only one lug 22 through a notch 5 without inserting the opposite lug 23 through the opposite notch 6 but allow such opposite lug 23 to remain in engagement on top of the flange 4 as is shown in FIG. 5. Upon twisting of the cap in the usual direction, indicated by arrow D in FIG. 5, latching lug 22 will ride over cam 8 and become tightly latched when the lug 22 abuts against stop 9. However, the opposite lug 23 will merely ride on top of flange 4, as is indicated in FIG. 6, so that the cap becomes latched only by one of the lugs 22 with the cap tilted as shown in FIG. 7, thus forming an open space 24 through which, in the case of an automobile gasoline tank, gasoline can escape upon movement of the automobile and thus create a hazard.

As previously related, the foregoing described construction is a typical bayonet connection between a spout and a cap, and is the type of construction in which the improvement of this invention is made to overcome the foregoing problem. Referring to FIGS. 8, 9 and 10, such improvement comprises a pair of de-

pending blocking prongs 26 and 27 integrally connected with the respective latching lugs 22 and 23, and which are substantially perpendicular to top 16 of the cap. In the embodiment illustrated, these prongs are integrally soldered or welded to the underside of latching lugs 22 and 23 but may be otherwise formed integrally with or otherwise fastened to or immediately adjacent the latching lugs.

Each of the blocking prongs is sufficiently long so that when a person in positioning the cap over the spout to close the same has only one lug 22 properly inserted through a notch 5, as shown in FIG. 9, the other lug 23 and associated blocking prong 27 must be properly inserted completely through the opposite notch 6 before the cap can be twisted closed. Otherwise blocking prong 27 associated with lug 23 will engage against a side edge 28 of notch 6, as is shown in FIGS. 9 and 10, which will preclude twisting of the cap either partially or fully to an apparently latched or sealed position.

In other words, a person closing the cap must have both blocking prongs 26 and 27 fully inserted through the notches 5 and 6, respectively, to clear the same, before the cap can be twisted to closed position. Thus, the blocking prongs preclude latching of the cap when it is seated at an angle, as shown in FIG. 10, thus permitting latching only when the cap is fully seated on the top of the spout. To enhance the blocking, the blocking prongs are desirably wider at their upper edges than the depth of the notches 5 and 6. In this connection, the two blocking prongs can be formed as end parts of an integral fin 29 extending transversely and downwardly from the latching lugs, as shown in FIG. 13.

In the embodiment of the invention illustrated, which is for a conventional gasoline tank filler spout, the spout is about 2-1/4 inches outside diameter with horizontal flange 4 about one-fourth of an inch wide, the depth of cam flanges 7 at the highest point about three-sixteenths of an inch, notches 5 and 6 about five-eighths of an inch wide, stops 9 and 12 each about five-eighths of an inch wide and three-eighths of an inch long, and the lower edge of centering hub 19 about five-eighths of an inch below the top surface of the cap. For the described size, a suitable length for each of blocking prongs 26 and 27 beyond the lower edge of centering hub 19 is about three-fourths of an inch. This will insure that the cap must be properly and evenly seated on the top of the filling spout before it can be twisted to fully latched position.

The above dimensions are merely by way of example, as it is to be understood that the length of the blocking prongs may vary depending upon the size of the spout and the particular dimensions of the cap. It is only necessary that they be at least sufficiently long as can be readily determined, to insure that the cap cannot be latched by only one latching lug when it is inadvertently positioned at an angle with only one latching lug engaging a cam surface.

In the previously described embodiment of this invention, an internal type bayonet connection is illustrated which is common for closure caps on automobile gasoline tanks; and the blocking prongs 26 and 27 are spaced inwardly of cylindrical cap flange 18 for entry through internal bayonet notches in the spout. The principle of the invention is also applicable to an external type bayonet connection, as is illustrated in FIGS. 11 and 12, wherein, for example, a radiator tank filling

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spout 31 is shown. The cap 32 therefor has inwardly extending diametrically opposite latching lugs 33 which are adapted to latch the cap by the camming action described above, by riding over external cams 34 on the radiator spout which has opposite external notches 36 through which latching lugs 33 are insertable. Blocking prongs 37 are shown as rigidly connected to cylindrical cap flange 35, and depend downwardly from below latching lugs 33 to insure that the cap is fully and evenly seated on the rim of the spout with sealing disc 38 in engagement with the spout before the cap can be twisted closed, as is indicated by the phantom lines in FIG. 12. However, the blocking prongs may be formed integrally with or fastened directly to latching lugs 33.

I claim:

1. A safety closure cap for bayonet connection with a filler spout of an automobile tank or the like, wherein the cap has a spring pressed sealing disc secured to its underside for sealing against the top of the spout, and wherein the spout has opposite notches only adjacent said top through which opposite latching lugs on said cap are insertable and upon turning of the cap it becomes latched over the top of the spout as the lugs ride over opposite cam surfaces on the spout which are located only adjacent the top thereof, the cap and the spout having an initial fit sufficiently loose whereby latching can be inadvertently effected by only one of the lugs with the cap tilted and the opposite lug engaging the top of the spout, said cap having means thereon to preclude said latching by only one lug, comprising opposite elongated blocking prongs extending downwardly from the respective latching lugs and which are engageable with either of the notches to prevent turning of the cap unless the cap is fully seated on the top of the spout.

2. The safety closure cap of claim 1 wherein each blocking prong is of sufficient length to prevent turning of the cap when only one latching lug is fully inserted through a notch.

3. The safety closure cap of claim 1 wherein each blocking prong is substantially perpendicular to the top of the cap.

4. The safety closure cap of claim 3 wherein each blocking prong is wider at the top than the depth of each of the notches.

5. The safety closure cap of claim 8 wherein the cap has a downwardly extending cylindrical flange and the blocking prongs are spaced inwardly of said flange to cooperate with internal notches of said spout.

6. A safety closure cap for bayonet connection with a spout wherein said spout has a top and opposite notches through which opposite latching lugs on said cap are insertable and upon turning of the cap it be-

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comes latched over the top of the spout as the lugs ride over opposite cam surfaces on the spout; said cap having means thereon to preclude latching by only one of the lugs with the cap tilted and the opposite lug engaging the top of the spout, comprising opposite elongated latching lugs, blocking prongs extending downwardly from the respective cap latching lugs, and which are engageable with edges of the notches to prevent turning of the cap unless the cap is fully seated on the top of the spout, said cap also having a downwardly extending cylindrical flange with which the blocking prongs are connected to cooperate with external notches of said spout.

7. A safety closure cap for bayonet connection with a spout comprising a top, a spring pressed sealing disc secured to the underside of the top for sealing against the top of the spout, opposite latching lugs located only at substantially the same level on the cap for bayonet connection upon turning of the cap on the spout with opposite bayonet notches of the spout located only adjacent the top of the spout, the lugs being sufficiently small relative to the bayonet notches to form a sufficiently loose fit of the cap on the spout whereby latching can be inadvertently effected by only one of the lugs with the cap tilted and the opposite lug engaging the top of the spout, and an elongated blocking prong extending downwardly from and rigid with each latching lug to insure that the cap is fully seated on the top of the spout before it can be turned to latch said cap into the spout.

8. A safety closure cap for bayonet latching with the filler spout of an automobile tank or the like comprising a top, a cylindrical flange extending downwardly from the top of the spout, a spring pressed sealing disc secured to the underside of the cap top located within said flange for sealing against the top of the spout when the cap is turned to close the same, only one pair of opposite latching lugs located at substantially the same level adjacent said top of the cap for insertion through opposite bayonet notches located at substantially the same level adjacent the top of said spout, said latching lugs being sufficiently small relative to the bayonet notches to form a sufficiently loose fit of the cap on the spout whereby latching of the cap onto the spout can be inadvertently effected by only one of the lugs with the cap tilted and the opposite lug engaging the top of the spout, and opposite elongated blocking prongs spaced inwardly of said cylindrical flange extending downwardly from the respective cap latching lugs and which are engageable with edges of the notches to prevent turning of the cap unless the cap is fully seated on the top of the spout.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,784,047 Dated January 8, 1974

Inventor(s) Alfred Cooper

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

Column 5, line 46 (claim 5, line 1 of the claim), the numeral "8" should read numeral --1--.

Signed and sealed this 30th day of July 1974.

(SEAL)  
Attest:

McCOY M. GIBSON, JR.  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents