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METAL BARREL BUNG AND METHOD OF MAKING SAME

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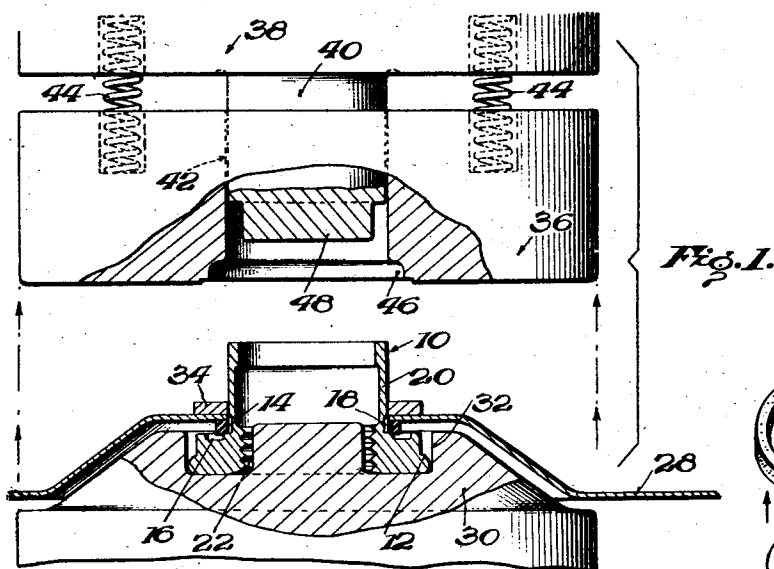


Fig. 2.

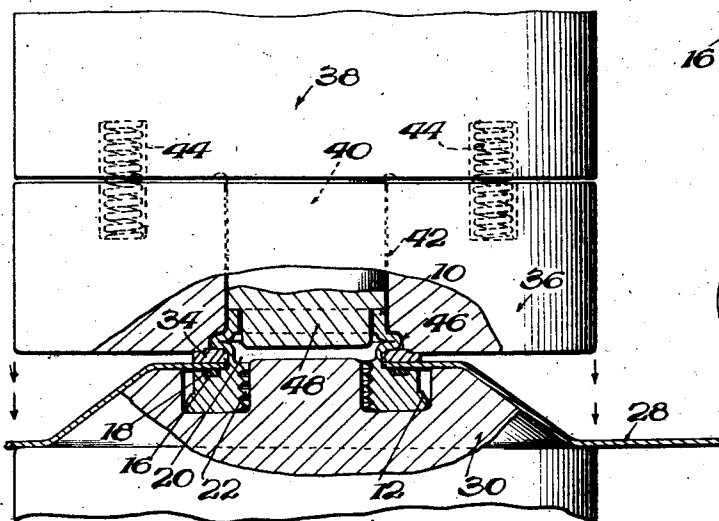
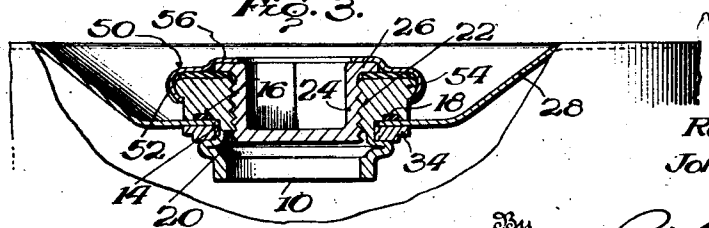


Fig. 3.



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METAL BARREL BUNG AND METHOD OF  
MAKING SAME

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9 Claims. (Cl. 29—148.2)

This invention relates to bung fixtures for hollow receptacles made of sheet material and has particular reference to the application of such fixtures to metallic receptacles adapted to contain fluid substances.

An object of the invention is to so associate the bung fixture with the wall of a sheet material container that a fluid-tight seal is produced and to so interengage the said fixture with the opening in which it is inserted that rotation of the bung fixture with reference to the container itself is substantially impossible.

An important feature of the invention resides in the method by which the above desiderata are accomplished in a few operations requiring a minimum of manual labor, thereby reducing the cost incident to this phase in the manufacture of such receptacles.

Various other objects and meritorious features of the invention will become apparent from the following description taken in conjunction with the drawing, wherein:

Figure 1 is a sectional elevation illustrating one step in uniting the bung fixture with the container;

Figure 2 is a similar section showing another step in the operation;

Figure 3 is a section showing the improved bung fixture assembled and provided with a capped closure;

Figure 4 is a perspective of the bung fixture per se, and

Figure 5 is a perspective of the cap seal used.

Referring now to the drawing, particular reference being made to Figure 4, the improved bung fixture per se consists broadly of a tubular body portion 10 provided with a flange 12 at one end. For the sake of brevity the tubular portion of the fixture will be referred to hereinafter as the "bung".

The exterior surface of the bung adjacent the under side of the flange is roughened, as indicated by the knurling 14. It is immaterial just how this roughened surface is produced, the important feature residing in the fact that a series of biting surfaces are provided on the exterior of the bung adjacent the base of the flange for a purpose to be brought out more clearly hereinafter. An annular gasket seat 16 is countersunk in the base of the flange and a resilient gasket 18 conforming in contour to the seat, but of substantially greater cross-sectional area, is slipped over the bung prior to assembling the fixture with a container.

In the form illustrated herein a midsection of

the bung wall is reduced in thickness. This detail of construction is indicated at 20 and it is to be understood that the term "midsection" refers to a length of wall positioned intermediate the ends of the bung fixture and not necessarily to a portion located at the precise middle of the fixture. The purpose of this midsection of reduced thickness, while secondary, will be brought out more clearly hereinafter.

The flange is provided with a threaded bore 22 of less diameter than any other portion of the bung interior. An externally threaded closure plug 24 may be threaded into the bung flange, the said plug being provided with a peripheral flange 26 adapted to overlie said bung flange.

The improved method of uniting the bung fixture with the container is illustrated clearly in Figures 1 and 2. One wall 28 of the container is provided with an opening adapted to receive the bung. The wall portion herein illustrated represents the conventionally depressed portion of the top of a sheet metal container, but the particular shape of the container wall to which the bung fixture is applied is obviously immaterial insofar as this invention is concerned. The bung fixture is first inserted in the opening provided in container wall 28 and these associated elements are then positioned on the anvil 30 of a die assembly, which anvil is provided with a countersink 32 corresponding in depth to that of the flange 12 and forming a seat therefor. The outer portion of the anvil conforms in contour to the desired shape of the container wall with which the bung fixture is associated, as indicated in the drawing. The gasket 18 is seated around the bung adjacent the flange and between said flange and container wall 28. A washer 34 is seated around the bung on the under side of the container wall 28.

The die punch assembly includes an outer punch member 36 and an inner punch member 38 having a central depending punch portion 40 extending down through a central bore 42 in the outer punch member. The inner punch is normally retained in spaced relation to the outer punch by means of coil springs 44 seated in aligned pockets provided in the two punch members. The normal spacing of the two punches is such that the depending punch portion 40 is withdrawn in the bore 42. The outer punch member 36 is provided with a peripheral pocket 46 at its base and depending punch portion 40 is cut away at its extremity to form a pilot 48.

Assuming the parts to be in the position illustrated in Figure 1, described above, the die punch assembly is moved downwardly until outer

punch member 36 strikes the washer 34 and forces the container wall 28 down upon the anvil 30, thereby squeezing the oversized gasket 18 into the seat 16 provided therefor. At the same time the biting surfaces 14 are cleared of the gasket, which is squeezed into its seat under considerable pressure and produces a fluid-tight seal between the underside of the bung flange and the top of container wall 28. At the same time the wall of the bung opening in container wall 28 and the washer 34 surrounding the bung are brought into the plane of the biting surfaces 14.

In the second stage of the uniting operation the inner punch member 38 is depressed against the resistance of springs 44, pilot 48 enters the bore of the bung, and punch portion 40 descends upon the bung to extrude the metal along midsection 20, outwardly and downwardly over the washer 34 to firmly grip the container wall and washer between the bung flange and the extruded portion of the bung. By virtue of the decreased thickness of the metal along midsection 20, which is obtained by reducing the thickness from the inside of the bung wall to thereby leave a smooth outer surface, the metal along such midsection tends to flow outwardly into the peripheral pocket 46 as the inner punch member descends.

During the extrusion of the metal along midsection 20 the biting surfaces 14 are forced outwardly to bite into the walls of the openings in washer 34 and container wall 28. This biting action precludes relative rotative movement of the bung fixture in the opening.

Containers of this sort are usually sealed in some manner so that any tampering or attempted tampering with the contents of the container during transit, or at any other time, may be readily detected. For this purpose we have illustrated a cap seal 50 having a depending skirt portion 52. This cap is placed over the flange 26 of closure plug 24 and the depending skirt portion is crimped around the enlarged head portion 54 of the bung flange by some suitable tool. The seal ring is offset around its inner circumference, as indicated at 56, to seat firmly on the top of flange 26. As is apparent from Figure 3, offset 56 must necessarily be mutilated before the closure plug 24 can be removed.

It will be seen from the foregoing that the several steps involved in uniting the bung fixture with the opening in container wall 28 comprise a method whereby the said wall is clamped firmly between the under side of the flange and the extruded portion of the bung wall to provide a fluid-tight seal and that the biting action between the outer surface of the bung and the wall of the container opening insures against relative rotation of the bung in the opening.

While that portion of the bung which has been reduced in thickness along the interior has been illustrated as a portion lying between the ends of the bung, it will be apparent that the interiorly reduced wall portion might be carried through to the end of the bung wall opposite the flange. In any event the wall folds down upon itself during the extruding operation to form a gripping flange of twice the thickness of the metal.

Various modifications of the invention will be apparent to those skilled in the art and for that reason we wish to limit ourselves only within the scope of the appended claims.

What we claim is:

1. A method of uniting a bung having a flange at one end with a container having an opening therefor which includes the steps of roughening

the exterior of the bung wall adjacent the flange, positioning the bung in the opening, aligning said roughened exterior with the side wall of the opening, and subsequently extruding a section of the bung wall outwardly over the wall of the said container to grip the same tightly between the flange and the extruded portion and force the roughened exterior of the bung wall laterally into the side wall of the opening to thereby preclude relative rotation between the container and bung.

2. A method of uniting a flanged bung with a container wall having an annular opening therein which includes the steps of providing the exterior of the bung wall with a biting surface removed from the extremity thereof, positioning said bung in the opening so that the biting surface is adjacent and in lateral alinement with the side wall of the opening, and expanding the bung wall laterally to produce biting engagement with the side wall of the container opening.

3. That method of uniting a flanged bung with a container having an opening therefor which includes the steps of providing the exterior wall of said bung adjacent the flange with a biting surface and the under side of said flange with a gasket seat, positioning the bung in said opening, squeezing an oversized gasket into said seat and retaining the gasket in seated position while extruding a section of the bung wall outwardly over the wall of the container on the side opposite the gasket to grip the same between the extruded portion and the flange and force said biting surface into the side wall of the opening.

4. A bung fixture for association with an annular opening in the wall of a sheet metal container comprising a tubular wall having a flange at one end and a plurality of biting surfaces around the outer surface of said wall adjacent the flange and spaced from the extremity of the tubular wall while lying within its circumference.

5. A bung fixture for association with an opening in the wall of a sheet metal container comprising a tubular wall having a flange at one end, a plurality of biting surfaces around the outer surface of said wall adjacent the flange and spaced from the extremity of the tubular wall, and a gasket seat extending around the under side of said flange.

6. A bung assembly for an apertured hollow sheet metal container comprising a flanged bung having a series of biting surfaces around the outer surface of the bung wall, removed from the extremity thereof and lying within its circumference, in biting engagement with the side wall of the aperture to secure the bung against relative rotation, and a section of the bung wall extruded outwardly to clamp the container wall adjacent the aperture against the under side of the flange.

7. A bung assembly for an apertured hollow container including, in combination, a bung having a flange at one end, a gasket seat on the under side of said flange, a biting surface on the outer surface of the wall of said bung adjacent the flange, said biting surface being in biting engagement with the side wall of said aperture to prevent relative rotation of the bung therein, an oversized gasket in said seat, and an outwardly extruded section of the bung wall clamping the container wall against the under side of the flange and squeezing said gasket into its seat.

8. A bung assembly including in combination with a container having a circular opening

5 therein an annular washer alined with said  
opening and seated on one side of the container  
wall, a flanged bung extending through said  
opening with the under side of the flange seated  
10 against the opposite side of the container wall,  
biting surfaces extending around the exterior  
surface of the bung wall in biting engagement  
with the side walls of said opening and washer,  
said bung wall being forced outwardly beyond  
15 the washer to compress the same against the  
container wall.

9. A bung assembly including in combination  
with a container having a circular opening  
therein an annular washer alined with said  
15 opening and seated on one side of the container

wall, a flanged bung extending through said  
opening with the under side of the flange seated  
against the opposite side of the container wall,  
an annular gasket seat extending around the  
under side of the flange, an oversized gasket 5  
positioned therein, biting surfaces extending  
around the exterior surface of the bung wall in  
biting engagement with the side walls of said  
opening and washer, said bung wall being forced  
outwardly beyond the washer to compress the 10  
same against the container wall and force the  
gasket into the seat to form a leak-proof seal  
on the flange side of the container wall.

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