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CLOSURE CAP

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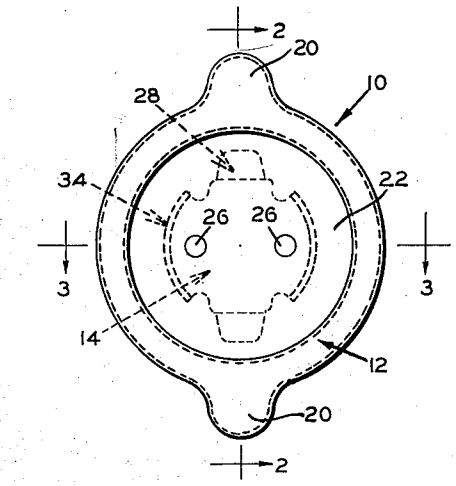


FIG. 1

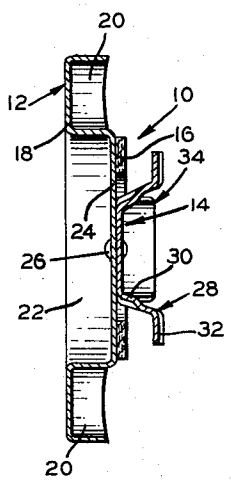


FIG. 2

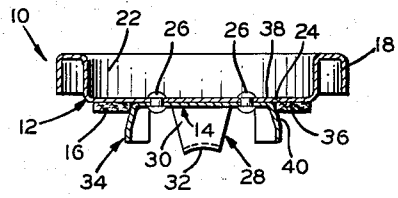


FIG. 3

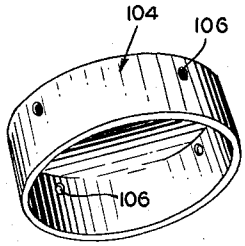


FIG. 6

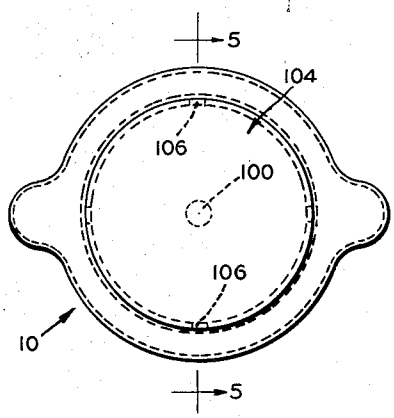


FIG. 4

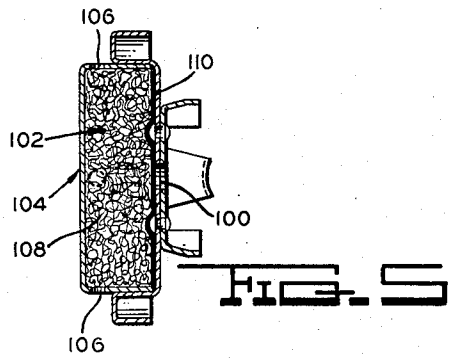


FIG. 5

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CLOSURE CAP

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4 Claims. (Cl. 220—40)

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This invention relates to closures and more particularly to cap closures for the filler neck openings of containers such as fuel tanks, radiators or the like.

Broadly, the invention comprehends the provision of a closure comprising three basic elements: a cap or shell, a keeper or resilient locking member affixed to the cap, and an annular gasket freely supported between the cap and keeper, thereby providing a novel and simple closure for effectively closing off a filler opening to which applied.

Among the several objects of the invention is the provision of a closure that is simple and economical of construction, that is designed for use on filler necks of containers having more than average variation in cam heights and still maintain a satisfactory seal; that can be used on filler necks where the opening is either flush or above the surface of the containers; that incorporates a singular stamping combined filler opening pilot and resilient locking member for the closure; and that provides a recess or well in the cap member thereof that is adapted to receive a filter assembly therein when venting provision is made in the closure.

Other objects and advantages of the invention will appear from the following description taken in connection with the drawings, forming a part of the specification, and in which:

Fig. 1 is a top elevation view of a closure, constituting the basis of the invention;

Fig. 2 is a cross-sectional view taken substantially along lines 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken substantially along lines 3—3 of Fig. 1;

Fig. 4 is a top elevation view of a modified form of the closure of Fig. 1;

Figs. 5 is a cross-sectional view taken substantially along lines 5—5 of Fig. 4; and

Fig. 6 is a perspective view of a cup-shaped element of the closure of Figs. 4 and 5.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

This closure was devised for the purpose of providing a closure which is simple of construction and economical of manufacture but which has a wide range of uses in that it is adaptable through the provision of a resilient locking member for use on filler necks having more than average variation in cam heights and on filler necks where the opening is either flush or above the surface of the container through the appropriate designing of the cap or outer shell member thereof. The cap member which is a single stamped member is additionally designed to provide a central recess or well therein which is adapted to receive a filter assembly in nestled relation therein when the cap is provided with vent means in the required use of providing ventilation for the container to which applied.

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The resilient locking member similarly to the cap is a single stamping and in addition, to a pair of oppositely disposed resilient fingers adapted to be freely movable over an extended range in engaging the cam engageable and locking means of the filler neck of containers to which the closure is applied, includes a pair of oppositely disposed axially extended wall sections, arranged intermediate to the resilient fingers, serving as a pilot for the closure to aid in the application of the closure to a filler neck therefor.

The resilient locking member is appropriately secured to the cap member and supports therebetween with the cap member an annular sealing gasket.

Referring to the drawings for more specific details of the invention 10 represents a closure, adapted for application to the filler openings of containers comprising a cap member 12, a resilient locking member 14 and an annular sealing gasket 16.

The cap member 12 is in the form of a shell having an annular channel section 18 interrupted by two diametrically opposite radially extending projections or wings 20, the purpose of which will hereinafter appear. A recess or well 22 is provided centrally of the channel section having a bottom portion 24 of the cap member integrally formed with the channel section.

The locking member 14 is fixedly secured to the bottom 24 of the cap member in centrally disposed relation thereto on the side thereof opposite to the well 22 by rivets 26 or other suitable means and includes a pair of diametrically oppositely disposed fingers 28, each having an angular portion 30 extending axially and radially away from the bottom 24 and a tip portion 32 integral with the angular portion at the extremity thereof extending radially outwardly therefrom, the purpose of which will hereinafter appear, and a pair of arcuate diametrically oppositely disposed axial extending wall sections 34, said sections being integral with and arranged intermediate the fingers 28.

The annular sealing gasket 16 of suitably pli-

able yet resistant material is supported in assembly between the cap member and the locking member with one face thereof in bearing relation upon the underside 36 of the bottom portion 24 of the cap member and with its internal peripheral edge 38 bearing upon tapered or shoulder portions 40 of wall sections 34. By providing the wall sections with the slightly tapered or shoulder portions 40 which have a greater diameter therebetween than the internal diameter of the sealing gasket, the gasket is restrained from movement from between the cap and locking member.

It is to be noted in the designing of the cap member that the channel section thereof was made to lie above a plane passing along the underside 36 of the bottom portion 24 of the cap member so that the closure could be used on a filler neck of a container having an opening either flush with or above the surface of the container.

For simplicity and economy of manufacture both the cap and locking members are preferably stamped to their desired shape with the fingers 28 of the locking member having a portion thereof displaced from between the oppositely disposed wall sections so as to lend effective resiliency thereto.

In the application of closure 10 to the filler neck of a container the wall sections 34 initially pilot the closure into the opening of the filler neck, whereas the tip portions 32 of the fingers 28 are received in appropriate slots provided in the filler neck of the container. Upon insertion of the locking member of the closure to a depth wherein the sealing gasket comes into sealing contact upon the top of the container to which the closure is applied, the closure is rotated through gripping relation with the projections 20 on the cap member and the tip portions 32 of the fingers 28 are made to engage appropriate cam surfaces provided in the filler neck of the container such that as the closure is rotated a resilient locking action occurs between the locking member and the cam sufficient to restrain accidental removal of the closure from the container. Because of the predetermined provided length of the fingers and the axial and radial extension of portions 30 thereof effective locking yet resilient fingers are provided permitting of an extended range of axial movement of the tip portions 32 of the fingers to compensate for variation in cam heights that may result from manufacture.

Figs. 4 through 6 illustrate a modified form of closure from that shown by Figs. 1 through 3 wherein air vent means in the form of an aperture 100 is provided extending axially through the locking member and bottom portion 24 of the cap member on the axis thereof into interconnected relation with well 22 in the cap member. As an effective means of filtering air passing into the container to which the closure is applied, through the aperture 100 in the closure a filter assembly 102 is provided adapted to be received in the well 22 of the cap member.

Filter assembly 102 comprises a cup-shaped member 104 having a plurality of circumferentially spaced apertures 106 in its axial wall, a mass of copper wool or like suitable filter material 108 held within member 104 and a wire screen 110 of predetermined desired mesh as an enclosure upon the open end of member 104 with material 108 within member 104. The filter assembly 102 is inserted into well 22 with the cup-shaped member 104 inverted such that the screen

110 is placed in adjacent relation to the bottom portion 24 of the cap member at the bottom of the well and with the outer periphery of the member having a snug fit relation with the inner peripheral wall of the channel section of the cap member for effectively retaining the filter element fixed with relation to the closure. It will be noted in the assembly of Fig. 5 that the cup-shaped member is provided having a height greater than the channel section of the cap member so that the apertures 106 will be exposed and thereby permit of atmospheric communication of the container to which the closure is applied by way of apertures 100 and 106 respectively in the closure and filter assembly communicating with the interior of the cup-shaped member disposed in well 22.

While this invention has been described in connection with certain specific embodiments, the principle involved is susceptible of numerous other applications that will readily occur to persons skilled in the art. The invention is, therefore, limited only as indicated by the scope of the appended claims.

What we claim is:

1. A closure for containers comprising a cap member having integral annular channel and central plate sections providing a cylindrical recess bounded on one end by the central plate section and on its external periphery by the channel section, a resilient locking member fixedly secured to the plate section of the cap member, on the side thereof opposite the recess, including a pair of angular outward radially extended diametrically oppositely disposed sections terminating in spring fingers lying in a plane parallel to the plate section and a pair of substantially axially extended diametrically oppositely disposed at least partially angular wall sections arranged intermediate the sections terminating in spring fingers, and an annular sealing gasket supported intermediate the plate section of the cap section and the angular portion of the resilient locking member, said channel section being disposed on the opposite side of a plane passing through the central plate section, from the sealing gasket and resilient locking member.

2. A closure according to claim 1, wherein the annular channel section of the cap member includes a plurality of outward radially extended wings.

3. A closure according to claim 1, wherein the wall sections are arcuate and the sealing gasket has an internal diameter that is smaller than the maximum external diameter of the wall sections.

4. A closure for containers comprising a cap member having an annular channel section, a plate section secured to the channel section adjacent the open axial end of the channel section and disposed centrally thereof providing a cylindrical recess bounded on one end by the plate section and on its external periphery by the channel section, a locking member fixedly secured to the plate section of the cap member on the side thereof opposite the recess including a pair of resilient diametrically oppositely disposed and outward radially extended fingers and a pair of axially outward angularly extended wall sections arranged diametrically opposite to one another intermediate the resilient fingers and an annular sealing gasket supported axially intermediate the wall sections and the underside of the plate section opposite the recess, said channel section lying wholly on one side of a plane in which the

central plate lies opposite from the locking member.

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