

March 4, 1941.

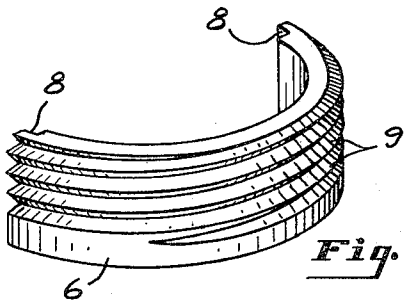
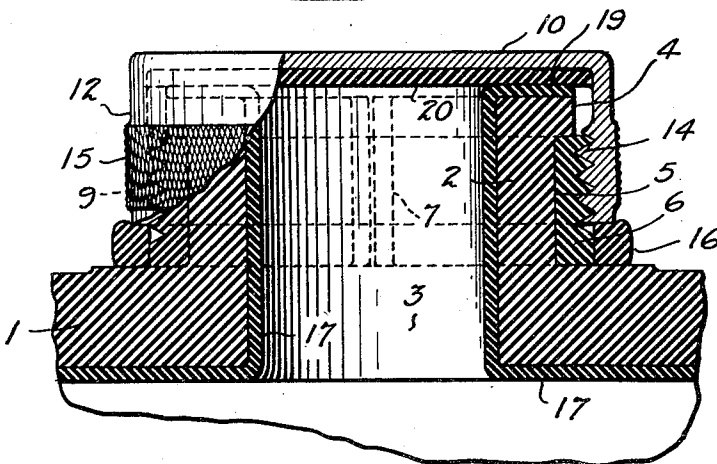
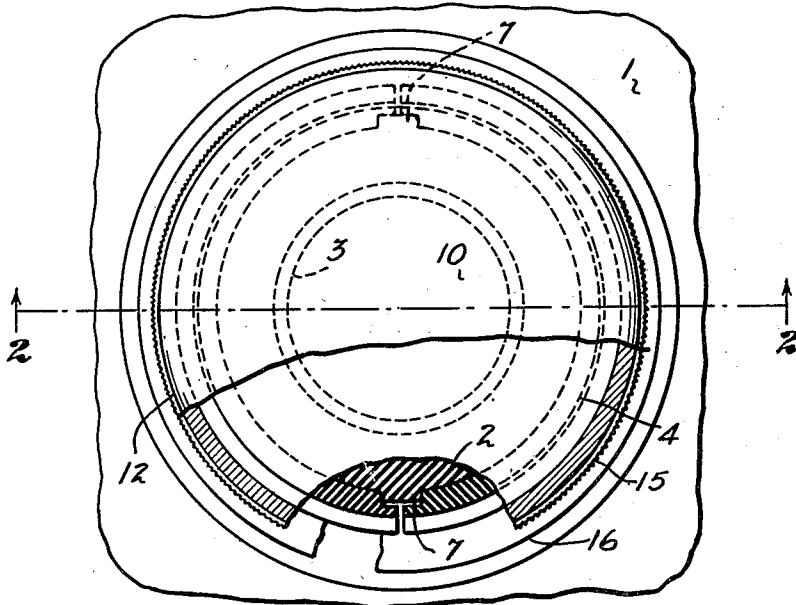
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2,234,084

CONTAINER CLOSURE

Filed Dec. 24, 1937

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

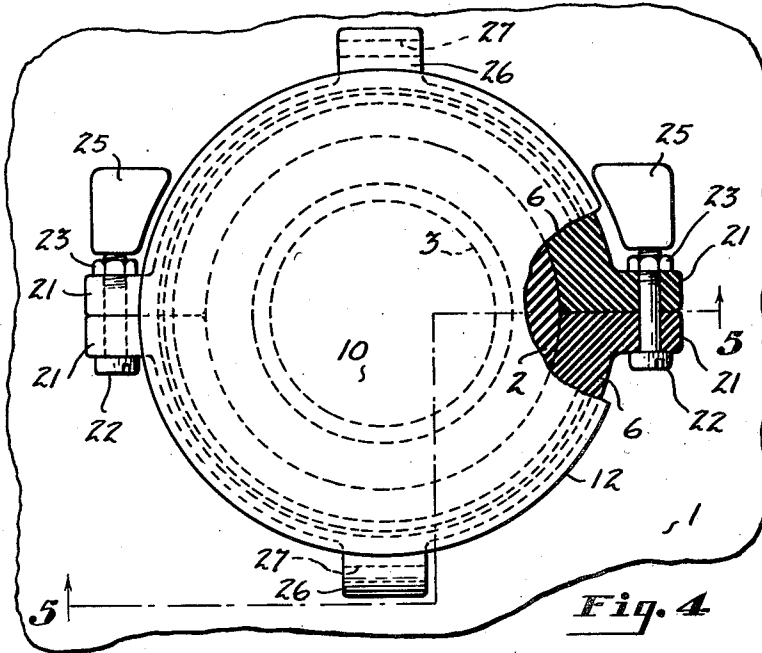


Fig. 4

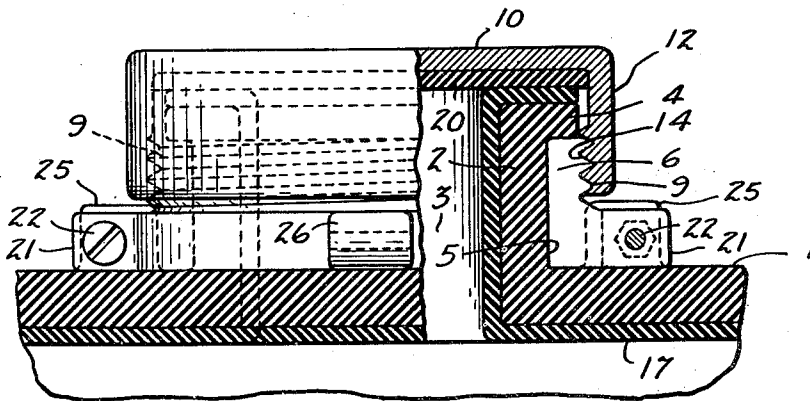


Fig. 5

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UNITED STATES PATENT OFFICE

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CONTAINER CLOSURE

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mesne assignments, to The General Tire & Rubber
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7 Claims. (Cl. 220—39)

This invention relates to closure devices for
containers, and more particularly to devices of
this character which are for use in connection
with containers formed of material which is not
advantageously threaded to secure a cap, such for
example as a rubber container for acids and the
like.

It is an object of this invention to provide a
container closure of relatively simple design and
inexpensive to manufacture, which affords a tight
seal for the opening of a container and which has
its essential elements removable from a container
so that it may be successively used on a plurality
of containers.

Suitable embodiments of the invention are illus-
trated in the drawings which show particular
combinations and arrangements of parts.

Figure 1 is a top or plan view partly in section
and with parts broken away, illustrating the
closure as applied to the neck member of an acid
container or the like;

Fig. 2 is a vertical sectional view taken partially
on the line 2—2 of Fig. 1;

Fig. 3 is a perspective illustration of one of the
segmental threaded holding elements used in the
closure construction described; and

Figs. 4 and 5 are views similar to Figs. 1 and 2
illustrating a modified embodiment of the in-
vention.

The closure illustrated in Figs. 1 to 3 inclu-
sive is shown as applied to a container for corro-
sive materials such as acids. Preferably the con-
tainer construction is designed so that the closure
may be applied to one of the heads of the con-
tainer indicated by the numeral 1. An upstand-
ing neck member 2 is formed on the head 1 and
has a central axial aperture 3 extending there-
through and communicating with the interior of
the container. This neck member is substan-
tially cylindrical in shape and at its upper ex-
tremity has formed thereon a peripheral radially
extending shoulder 4. There is thus provided
between the radial shoulder 4 and the head 1 of
the container a channel or groove 5 which ex-
tends circumferentially about the neck member 2.
Received in the channel 5 are a plurality of seg-
mental holding elements 6. These holding ele-
ments seat against the neck member 2 at the
bottom of the annular groove 5 and are of suf-
ficient thickness to extend a substantial distance
radially beyond the peripheral marginal edge of
the shoulder 4. It is preferable to form the hold-
ing elements and neck member 2 so that the
former cannot slide circumferentially about the
latter. This may be accomplished by providing

axially extending ribs 7 on the neck member 2
arranged crosswise of the channel 5. A suitable
location for these ribs has been found to be be-
tween the abutting ends of the segmental hold-
ing element 6. Accordingly, the ends of the ele-
ment have portions removed as indicated at 8 to
accommodate the ribs 7.

As shown in the drawings, the holding elements
preferably abut one another to provide a substan-
tially continuous collar extending circumferen-
tially about the neck 2. It is contemplated, how-
ever, that for certain applications the ribs 7 may
be made considerably wider than shown, so that
the ends of the holding elements 6 do not abut
one another but may be separated substantial
distances. All of the holding elements 6 have
their external circumferential surfaces formed
with threads 9 which cooperatively afford threads
extending continuously and circumferentially
about the neck member 2.

A cap 10 fits over the end of the neck member
2 across the opening of the aperture 3, thus clos-
ing and sealing the container. Preferably, the
cap is cup-shaped, having a depending annular
flange 12 formed on its peripheral marginal edge.
This flange is internally threaded at 14 so that it
may be screwed onto the holding elements 6.
Desirably, the outer surface of the flange 12 may
be knurled as indicated at 15 to facilitate the
tightening and loosening of the cap. The in-
ternal diameter of the flange 12 is sufficiently
greater than that of the shoulder 4 on the neck
member 2 so that in applying the cap to close the
opening 3 there is no engagement between the
threads 14 and shoulder 4. Accordingly, the se-
curing of the cap to the neck member 2 is solely
through the holding element 6.

As previously mentioned, the holding elements
are seated in the annular groove or channel 5.
They are restrained against axial movement on
the neck 2 by the head 1 of the container and
the radially extending shoulder 4 of the neck.
Thus, by means of the threads 9 and 14 the cap 10
may be tightened down upon the end of the neck
to securely seal the opening 3. When the cap is
in this position the holding elements 6 are sup-
ported between the neck 2 and circumferential
flange 12 of the cap to prevent their becoming
dislodged or displaced. In this tightening of the
cap there may be a slight deformation of the end
of the neck 2 and the shoulder 4 in the event
that these parts are formed of plastic or resilient
deformable material. This action is desirable
and beneficial, since the sealing action is im-
proved and the area of contact between the cap

and neck may be increased. In addition, the neck 2 is supported by the holding elements 6 which are seated in abutting relationship therewith. In tightening or loosening the cap 10 the ribs 7, engaging with the transverse cutaway portions or grooves 8 in the ends of the holding element 6, prevent the latter from moving circumferentially about the neck.

When the cap 10 is removed from the container it is desirable to provide means for preventing the holding elements 6 from becoming displaced from the groove or channel 5. This is accomplished by an annular band 16 which surrounds the neck and holding elements. Preferably this band is elastic in character, such for example as a rubber band. It is slightly distended when applied about the holding elements so that they are compressed and urged against the bottom of the groove 5. If desired, this band may be of slightly greater width than the distance between the head 1 of the container and the marginal edge of the flange 12 of the cap when the latter is applied to close the opening 3. Thus the band 16 will be slightly compressed between the flange 12 and head of the container, to afford a secondary seal between the cap and container and prevent foreign matter such as dirt and dust from reaching the threads 9 and 14. This secondary seal may be particularly effective if the band 16 is made of a relatively gumlike rubber.

It is contemplated that closures of this character will be applied to containers manufactured with the head 1 and neck 2 integrally formed of the same plastic composition such as rubber. Additionally, if a corrosion-resisting lining 17 is provided for the interior of the container it is intended that this lining shall be extended longitudinally through the opening or aperture 3 to the end thereof and then radially over the end of the neck member 2 to the peripheral margin of the shoulder 4. In this event a similar lining 20 will also be applied to the interior surface of the cap 10 so that a complete corrosion resisting lining will be afforded the container. The portion 19 overlying the end of the neck 2 is in contact with the lining 20 of the cap 10 for a relatively large extent and the sealing is increased because of the relatively soft character of the corrosion-resisting lining.

It will be apparent that a container closure of the character described above will be of advantage in numerous applications, particularly when applied to containers which are constructed of relatively soft yieldable material which cannot be satisfactorily threaded to retain other types of closures. The parts of the closures are arranged to confine and support the neck container opening so that the latter will not collapse. Furthermore, in the event that the particular container to which the closure is originally applied should become damaged or otherwise unfit for use, the several parts of the closure may be removed therefrom and used on another.

In Figs. 4 and 5 is illustrated a modified construction in which parts corresponding to those described in connection with the embodiment illustrated in Figs. 1 through 3 have been indicated by the same numerals of reference. In this modification the holding elements 6 are formed with radially directed ears 21 which seat on the head 1 of the container. The ears 21 from the two holding elements abut one another and are secured together by bolts 22 and nuts 23, the former extending through suitable apertures in the ears.

Upstanding bosses or stops 25 are formed on the head 1 or secured thereto by vulcanization and engage the bolts 22 so as to prevent rotation of the holding elements 6.

An extension 26 projecting radially from a central portion of each of the holding elements 6 is disposed against the head 1 of the container and is formed with an aperture 27 so that shipping tags may be tied thereto. As illustrated in Fig. 4, the extensions 26 may be diametrically opposed to one another on opposite sides of the neck 2 of the container so that a wire seal of well known construction may be placed across the cap 10 to seal the container, since the closure cannot then be removed without breaking the wire seal. When used for this purpose the ends of the wire seal are passed through the apertures 27 on opposite sides of the cap and then twisted together and sealed over the top thereof.

In addition to holding the elements 6 against rotation the stops 25 protect the closure from injury and if desired for this purpose a multiplicity of the stops 25 may be provided in addition to those shown, all being located at substantially equal radial distances from the axis of the neck 2 and disposed outside the peripheral outline of the cap 10.

Other modes of utilizing the principles of the invention are contemplated and may be resorted to without departing from the scope of the invention, change being made in the details of construction shown and described as desired, it being understood that the particular embodiments shown in the drawings and set forth in the specification are given for purposes of explanation and illustration.

What I claim is:

1. In combination with a container having a protruding self sustaining neck member of resilient deformable material formed thereon and an opening through said member communicating with the interior of the container, a closure device comprising holding elements stiffer than said neck member disposed against the outside of the neck member, a cap over an end of the neck member to close the opening, said cap having an annular flange which embraces the elements to retain the latter against the member, interfitting formations on the elements and cap for securing the cap in embracing position, and a resilient band embracing the elements and neck member to independently retain the elements against the neck member upon removal of the cap.

2. In combination with a container having a protruding neck member formed thereon and an opening through said member communicating with the interior of the container, a closure device comprising holding elements disposed against the outside of the neck member, a cap over an end of the neck member to close the opening, said cap having an annular flange which embraces the elements to retain the latter against the neck member, interfitting formations on the elements and cap for securing the cap in embracing position, a deformable and removable band embracing the elements and neck member to independently retain the elements against the member upon removal of the cap, and a peripheral shoulder on the cap flange engageable with the deformable band to compress the latter and effect a seal therewith.

3. A closure construction for a self-sustaining deformable rubber container comprising a substantially cylindrical self-sustaining deformable

rubber neck member integral with the rubber of the container, an opening through the neck member communicating with the interior of the container, a radial circumferential shoulder formed about the neck member by the material of the container, a laterally projecting rubber flange on the end of the neck, a segmental holding element removably disposed against the outside of the neck and between said flange and said radial shoulder formed by the container, the element having opposite side edges in engagement with the flange and the container shoulder to resist axial movement of the element with respect to the neck, a cap over the flanged end of the neck member to close the opening through the neck, a flange on the cap overlying the element, and interfitting formations on the element and cap flange for securing the cap on the neck, said interfitting formations being arranged for progressive tightening of the cap to effect a deformation of the neck flange, thereby effecting a fluid tight seal between the cap and neck flange.

4. A closure construction for a self-sustaining deformable rubber container having a relatively thin lining of corrosion-resistant material, comprising a substantially cylindrical self-sustaining deformable rubber neck member integral with the rubber of the container, an opening through the neck member communicating with the interior of the container, a laterally projecting rubber flange on the end of the neck, a relatively thin lining of corrosion-resistant material integral with the container lining and extending continuously over the walls of the opening through the neck and radially over the rubber flange at the end of the neck, a segmental holding element removably disposed against the outside of the neck between the neck flange and the container, a cap over the flanged end of the neck to close the opening, a corrosion-resistant lining inside the cap at the end thereof which closes the opening, said cap lining having circumferential contact with the radial portion of the neck lining disposed over said flange, a flange on the cap disposed in overlying relation with respect to the holding element, and interfitting formations on the element and cap flange for progressively tightening the cap against the neck flange, said cap and holding element being arranged, on progressive tightening thereof, to deform the neck flange and tightly compress the corrosion-resistant lining overlying the neck flange against the corrosion-resistant lining of the cap to seal the opening.

5. In combination with a container having a

protruding deformable and resilient neck member formed thereon and an opening through said member communicating with the interior of the container, a closure device comprising a pair of holding elements seated against the member, a projecting rib formed on said neck member, an end of each holding element having a portion removed for interfitting relation with the rib, the ends of said elements being spaced and opposed to one another and separated by said rib to abut thereagainst to resist endwise movement of the elements about the neck member, a cap over an end of the neck member to close the opening, said cap having an annular flange which embraces the elements to retain the latter against the member and to draw the spaced ends of the elements together around the resilient neck and against the opposite sides of the rib, and interfitting formations on the elements and cap for securing the cap in embracing position.

6. A closure construction for a container comprising a substantially cylindrical neck member integral with the container and having an opening therethrough in communication with the interior of the container, holding elements embracing the neck, said elements having their ends in abutting relation, fastening means securing said ends together, protruding formations on the container engageable with the said fastening means only, to prevent rotation of the holding elements on the neck member, a cap over the end of the neck member to close the opening, and interfitting formations on the elements and cap to secure the cap on the neck.

7. A closure construction for a container comprising a substantially cylindrical deformable and resilient neck member integral with the container and having an opening therethrough in communication with the interior of the container, a radially directed circumferentially extending shoulder formed about the neck member by the material of the container, a laterally projecting flange on the end of the neck, an axially disposed rib formed on the neck and integrally joined to the neck flange and container shoulder, holding elements disposed against the outside of the neck between the flange and shoulder, said elements having their ends spaced from one another abutting against the rib, a cap over the flanged end of the neck to close the opening, and interfitting formations on the holding elements and cap to secure the cap on the neck and to draw the spaced ends of the elements together around the resilient neck and against the opposite sides of the rib.

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