Dec. 30, 1969 H. H. SCHELLHAS 3,486,654

CONTAINER CLOSURE HAVING THREADED COLLAR

Filed Dec. 2, 1968

FIG 1.

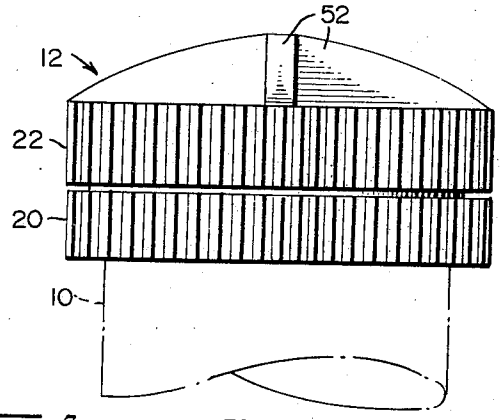


FIG 2.

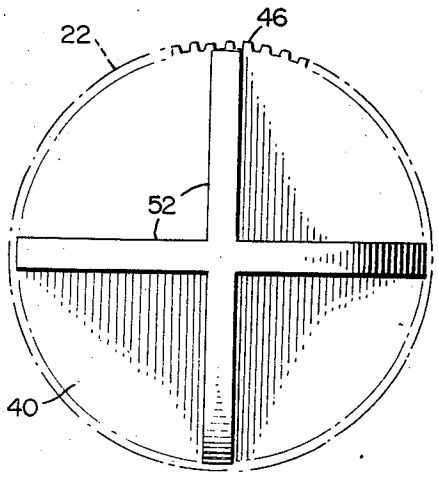


FIG 6.

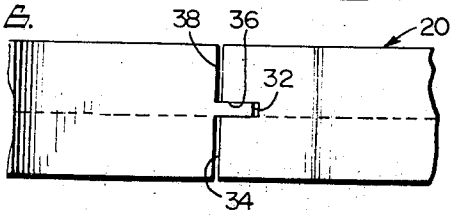


FIG 4.

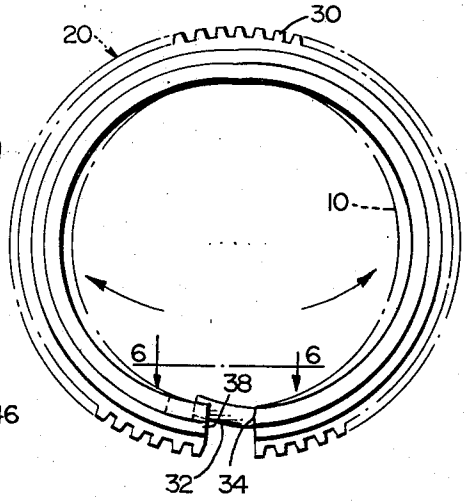
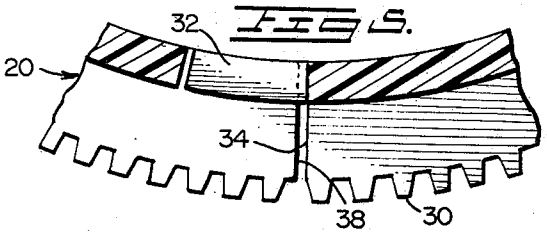


FIG 5.



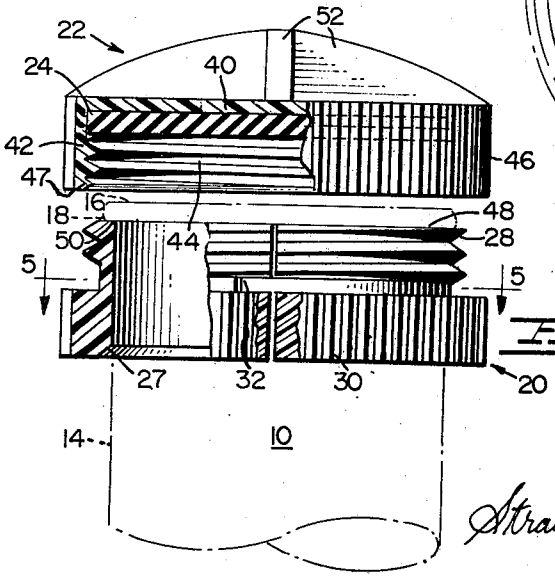


FIG 3.

INVENTOR

HERBERT H. SCHELLHAS

Strauch, Nolan, Neale, Nies & Kurz

ATTORNEYS

United States Patent Office 3,486,654 Patented Dec. 30, 1969

3,486,654

CONTAINER CLOSURE HAVING THREADED COLLAR

Herbert H. Schellhas, 8 Grant St.,
Pleasantville, N.Y. 10570

Filed Dec. 2, 1968, Ser. No. 780,388
Int. Cl. B65d 41/08
U.S. Cl. 215—43 5 Claims

ABSTRACT OF THE DISCLOSURE

A container sealing device including an externally threaded split-ring retainer adapted to surround the container and engage the bead at the opened end thereof, a cover having an internally threaded flange adapted to be threaded onto the split-ring component, and a gasket disposed in the cover and adapted to be compressed between the opened end of the container and the cover when the latter is threaded on the split-ring retainer to provide a seal between the interior of the container and the ambient atmosphere.

The present invention relates to devices for sealing containers, and, especially, to such devices which are capable of providing a substantially gas-tight seal between the interior of the container and the ambient atmosphere and are, therefore, particularly useful for resealing and minimizing the loss of carbonation from containers such as soft drink cans, beer cans, and the like.

A number of closure container devices at least generally similar in appearance to that invented by applicant have heretofore been proposed. Exemplary of these are the devices shown in U.S. Patents Nos. 2,448,569 issued Sept. 7, 1948 to A. M. Allen for Nursing Unit; 2,563,366 issued Aug. 7, 1951 to H. Raymond for Coupling Device; 3,145,868 issued Aug. 25, 1964 to E. J. Stengle for Container; and 3,297,187 issued Jan. 10, 1967 to W. C. Thiesen for Closure Devices for Containers, Jars, and the like.

Of the foregoing closure devices, that most nearly resembling the device invented by applicant is shown in Stengle Patent No. 3,145,868. Stengle's device includes a retainer ring adapted to surround and abut a bead on the container at the end to be sealed and a gasket carrying cover member. The latter is threaded on the retainer to compress the gasket between the end of the container and the top wall of the cover member, thereby providing a seal between the interior of the container and the ambient atmosphere.

Applicant has experimented extensively with closure devices of the type just described but has found them lacking in several respects. First, as mentioned above, applicant's invention is particularly adapted to the resealing of can-type containers. These commonly have beads at both ends; and it is, accordingly, necessary to employ a split-type retainer ring as mentioned in column two of Stengle or a multi-part retainer ring as shown in Raymond Patent No. 2,563,366 so that the retaining ring can be assembled on the container. Multi-part rings have the obvious disadvantage that it is difficult to hold them in an aligned position while the cover member is being threaded in place. The same is true of the split-ring type retainer (in this conjunction, unless the ends of the retainer or retainer components are precisely aligned, the continuity of the threads on the ring will be interrupted, making it difficult to thread on the cover component).

Another disadvantage of container sealing devices of the type shown in the Stengle and Raymond patents is that the cover completely surrounds the retaining ring, making it impossible to grip the latter and prevent it from rotating while the cover component is being threaded.

This makes it awkward to thread the cover on, especially in the case of multi-part and split-type retainer rings.

Applicant has further found through experimentation that the type of cover component shown in the Stengle and Raymond patents is not capable of producing a gas-tight seal and is therefore not satisfactory for applications such as the resealing of carbonated beverage containers due to lack of rigidity. With a cover member of the type shown in these patents threaded on the retaining ring, gas pressure within the container will cause the top wall of the cover component to bulge, and the seals between the container and gasket and/or gasket and cover component will accordingly not be tight enough to maintain pressure in the container.

As suggested above, the novel container sealing devices invented by applicant include generally the same components as are employed in the Raymond and Stengle devices; viz, a split-type retainer adapted to be assembled on the container to be sealed; a cover threadable on the retaining ring; and a gasket carried by the cover and adapted to be compressed between the latter and the opened end of the container to provide a gas-tight seal. However, while applicant's novel device resemble those shown in the Raymond and Stengle patents to this extent, it differs from the latter in several important respects.

More specifically, precise alignment of the ends of the split ring is assured by a projecting tongue on one end of the ring and a cooperating groove on the other or a comparable arrangement. Problems attributable to inexact alignment of the external threads on the retainer ring are accordingly completely eliminated in applicant's invention, making the assembly of the sealing device on a container much simpler.

Assembly of the cover component onto the retaining ring is further facilitated by a configuration of the latter which permits it to be readily grasped and prevented from rotating while the cover is being threaded onto it. This eliminates the slippage problem appurtenant to the Raymond and Stengle devices. To further facilitate this assembly step, peripheral portions of the retaining ring and/or cover member may be grooved or knurled to make them even easier to grasp.

A third important innovation in applicant's novel container sealing device is the addition of stiffening ribs to the top wall of the cover component. This eliminates the "bulging" problem encountered with cover components of the type shown in the Raymond and Stengel patents and makes it possible to obtain a gas-tight seal.

From the foregoing, it will be apparent that the primary object of applicant's invention is the provision of a novel, improved, closure device for containers. Other important, but more specific objects of the invention, reside in the provision of container closures in accord with the preceding object which:

(1) Are capable of providing a substantially gas-tight seal and are therefore particularly useful for resealing carbonated beverage containers and the like.

(2) Are more easily assembled on the container than those heretofore known.

(3) In conjunction with object No. 1, include a cover component provided with reinforcing ribs and therefore capable of compressing a gasket member in substantially gas-tight relationship between the cover component and the container to be sealed.

(4) In conjunction with object No. 2, include a retaining ring so configured that it can be easily grasped and held against rotation while a cover component is being threaded on it.

(5) In conjunction with object No. 2, employ an externally threaded, split-ring type retainer provided with

a novel arrangement which insures alignment of the threads on the member.

(6) In conjunction with object No. 2, include retaining ring and cover components with ridged or knurled peripheral portions to facilitate the threading of the cover component onto the retaining ring.

Other objects, further novel features, and additional advantages of applicant's invention will become apparent from the appended claims and from the ensuing detailed description and discussion of an exemplary embodiment of the invention as it proceeds in conjunction with the accompanying drawing, in which:

FIGURE 1 is a side view of a container and closure device constructed in accord with the principles of the present invention;

FIGURE 2 is a top view of the container closure device of FIGURE 1;

FIGURE 3 is an exploded view of the container closure device with the components thereof shown partly in section;

FIGURE 4 is a plan view of a split-type retainer ring employed in the closure device in a "spread" or distorted configuration which allows it to be slipped onto the container to be sealed;

FIGURE 5 is a fragmentary section through the retaining ring, taken substantially along line **5—5** of FIGURE 3; and

FIGURE 6 is a fragmentary view of the retaining ring, looking generally in the direction of arrows **6—6** in FIGURE 4.

Referring now to the drawing, FIGURE 1 depicts a container **10** on which a container closure device **12** embodying the principles of the present invention has been assembled to provide a seal between the interior of the container and the ambient atmosphere. As shown in FIGURE 3, containers of the type with which closure device **12** is intended to be employed will typically include a side wall **14**, a top[1] wall **16** in which one or more openings (not shown) will be made so that the contents of the container may be extracted, and a bead **18** which joins the container top and side walls and protrudes beyond the latter around the periphery of the container.

The container closure device **12** includes a retainer ring **20** dimensioned to surround and engage side wall **14** of container **10** and abut bead **18** on the side thereof opposite top wall **16**, a cover **22** adapted to surround the open end of the container and to be threaded on retainer ring **20**, and gasket **24**. The gasket is disposed in cover **22** and provides substantially gas-tight seals between container **10** and cover **22** and between cover **22** and the ambient atmosphere when the closure device is assembled on the container. This isolates the interior of the container from the ambient atmosphere.

Retainer ring **20** is of the split type as shown in FIGURES 3–6. It is typically fabricated of a plastic, metallic, or other material having at least a limited degree of flexibility so that its ends may be spread apart as shown in FIGURE 4, allowing it to be slipped over the bead **18** at the end of the container **10**, an operation facilitated by a chamfer **27** on the lower inner edge of the ring.[2]

The retainer ring has an upper portion on which external threads **28** are formed and a lower portion **30** which is preferably ridged or knurled so that it may be easily gripped and restrained against rotation while cover **22** is threaded on it. The threads **28** may be of the illustrated configuration or, alternatively, of the rolled type

[1] References to specific orientations are employed herein solely to facilitate the description of applicant's invention and are accordingly not to be construed as limitations on the scope of the coverage which the appended claims are intended to afford.

[2] Chamfer 27 also facilitates removal of the retaining ring from the container since it permits the ring to be easily slid over the bead (not shown) at the lower end of the container.

commonly employed on Mason jars and the like to facilitate assembly of the cover to the retainer ring.

As shown in FIGURES 3–6, a longitudinally extending tongue **32** is formed on one end **34** of retainer ring **20** between threads **28** and knurled portion **30**, and a correspondingly configured recess or groove **36** is formed in the opposite end **38** of the ring. This novel tongue and groove arrangement is an important feature of the present invention since it aligns external threads **28** at the juncture between the ends **34** and **38** of the ring, eliminating the alignment problem appurtenant to the "prior art" retaining rings discussed above and thereby facilitating the assembly of cover **22** on the retainer ring.[3]

The cover **22** which cooperates with retainer ring **20** to seal container **10**, as best shown in FIGURE 3, has a top wall **40**, which spans top wall **16** of container **10**, and a cylindrical depending flange **42**. Internal threads **44** in flange **42** are configured to mate with the external threads **28** on retainer ring **20** so that cover **22** may be threaded onto the retainer ring.

Cover **22** may be fabricated of the same material as retainer ring **20** although it does not have to be, the main requirement being that it have a reasonable degree of structural ragidity. As in the case of retainer ring **20**, the peripheral portion **46** of the cover is preferably ridged or knurled to facilitate the threading of the cover onto the retainer ring. In addition the "starting" of the cover on the retaining ring is preferably further facilitated by a chamfer **47** in the lower inner edge of cover **22**.

As shown in FIGURE 3, the gasket **24** is disposed in cover **22** adjacent the top wall **40** thereof and retained in place by friction and the upper most of the internal threads **44** on flange **42** or by cementing it to the top wall of the cover. Gasket **24** may be fabricated of any of the numerous available gasket materials. It is preferred, however, that the gasket material employed be resilient and relatively soft to provide as gas-tight a seal as possible. Gasket **24** may be of the solid, disc type illustrated in FIGURE 3 or of annular configuration and the number of gaskets may be increased, if desired.

As shown in FIGURE 3, retainer ring **20** is assembled on container **10** with its upper edge **48** abutting the ledge **50** formed by the lower side of bead **18**. Retainer ring **20** is then gripped to restrain it against rotation and cover **22** threaded onto the retainer ring. As mentioned above, this is facilitated by the cooperating ridging or knurling on the retainer ring and cover. The threading operation is also facilitated in applicant's invention by automatic alignment of the threads at the juncture of the ring ends and the provision of the lower portion **30** which is not surrounded by cover **22** and can accordingly easily be gripped while the cover is being threaded onto it.

As cover **22** is threaded onto retainer ring **20**, it moves downwardly with respect to container **10** because of the engagement between retainer ring **20** and ledge **50**. This compresses gasket **24** between the bead **18** at the upper end of the container and the top wall **40** of cover **22**, providing a substantially gas-tight seal between the container and the gasket and between the gasket and cover **22**, thereby isolating the interior of the container from the ambient atmosphere.

In conjunction with the foregoing, another novel and important feature of the present invention is the addition of radially extending, vertically oriented reinforcing ribs **52** to the top wall **40** of cover **22**. These reinforcing ribs are important in that they prevent the upper wall **40** of the cover from flexing or bulging upwardly and destroying the gas-tight seal provided by gasket **24** when cover **22** is tightened.

From the foregoing it will be apparent that applicant's novel closure device is particularly useful for applica-

[3] If desired, a comparable arrangement such as a pin and slot or male-female V-joint may be substituted for the illustrated tongue and groove type of aligning system.

tions such as the resealing of carbonated beverage containers because of the substantially gas-tight seal it provides. It will be equally obvious, however, that it is by no means limited to such applications but that it may instead be used in virtually any circumstances calling for a removable container closure device. The reference to the resealing of carbonated beverage containers is accordingly not intended by applicant to be a limitation on the scope of the invention.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. A container sealing device comprising an externally threaded retaining ring adapted to surround the container adjacent an open or opened end thereof; a cover adapted to be threaded onto said ring; and a gasket adapted to be clamped between said cover and said container to provide a seal between the interior of said container and the ambient atmosphere, said retaining ring being of the split type and fabricated of a resilient material, whereby said ring may be spread and fitted around said container, there being co-operating means on the ends of said ring for aligning the external threads on said retaining ring at the ends thereof; said cover including a top part configured to span the container end and a flange depending from said top and having therein internal threads configured to mate with the external threads on said retainer ring; said gasket being disposed in said cover adjacent the top thereof and thereby adapted to engage the container end when the cover is threaded on the retainer ring; and there being stiffening ribs on said cover top to add rigidity thereto so that said gasket is maintained in tight sealing engagement with said cover top and said container when said cover is threaded on said retainer ring.

2. The device of claim **1**, wherein the periphery of one or both of said components is knurled to facilitate the threading of said cover onto said retaining ring.

3. The device of claim **1**, wherein the inner edge of said retainer ring is chamfered at one side thereof to facilitate the assembly of the retainer ring on the container.

4. The device of claim **1**, wherein the inner edge of the cover flange at the side thereof opposite the cover top is chamfered to facilitate the threading of the cover on the retainer ring.

5. The combination of a container having a side wall and an end wall and a bead joining said side wall to said end wall and protruding beyond said wall with a container sealing device as defined in claim **1**, the normal diameter of the sealing device retainer ring being less than the diameter of said bead whereby, when the sealing device cover is threaded on said retainer ring, said ring is engaged with said bead on the side thereof opposite said cover top and said gasket therefore compressed between said bead and the top of said cover.

References Cited

UNITED STATES PATENTS

3,145,868	8/1964	Stengle	215—43
3,297,187	1/1967	Thiesen	215—43

GEORGE T. HALL, Primary Examiner

U.S. Cl. X.R.

215—95; 220—39, 46