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C. SCHOONMAKER

2,040,798

TELLTALE CLOSURE DEVICE

Filed June 5, 1934

FIG. 1.

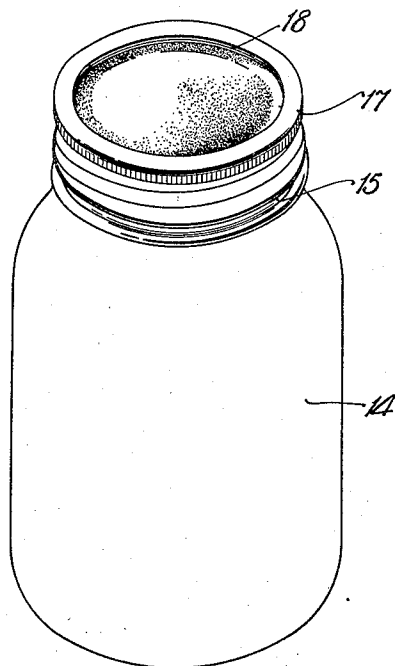


FIG. 2.

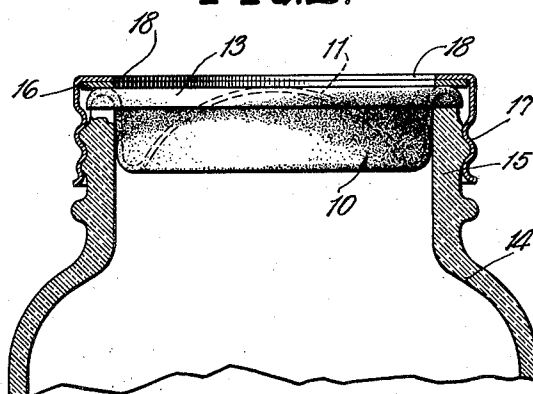


FIG. 3.

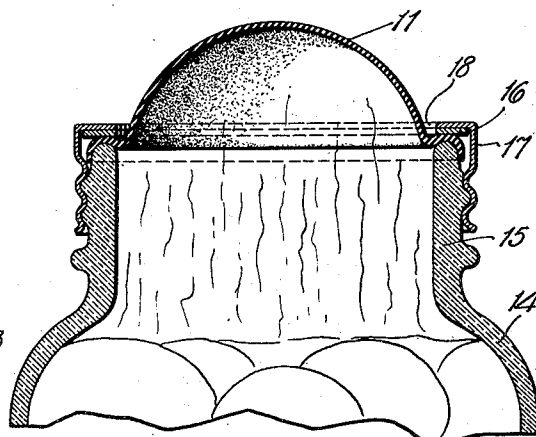


FIG. 5.

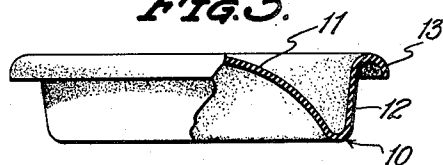


FIG. 4.

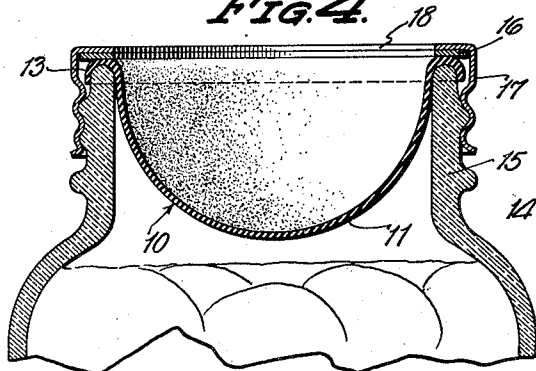
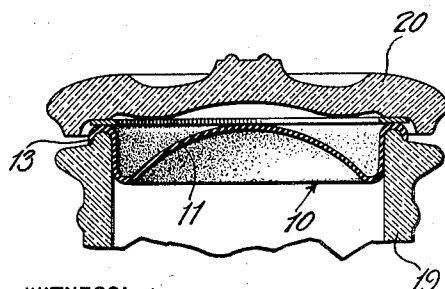


FIG. 6.



WITNESS:

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UNITED STATES PATENT OFFICE

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TELLTALE CLOSURE DEVICE

Carl Schoonmaker, New York, N. Y.

Application June 5, 1934, Serial No. 729,069

6 Claims. (Cl. 215—37)

This invention relates to improvements in sealing and closure devices for jars or other like containers, and this application constitutes a continuation in part of my patent application Serial No. 634,310, filed September 22, 1932.

More particularly, the invention relates to a tell tale device which in itself seals the open top of a container and it also visibly indicates a difference in pressure between the interior of the container and atmospheric pressure to denote the positive sealing of the container.

Another feature of the invention resides in a tell tale sealing and closing device for use upon glass jars such as the Mason and wire clamp types, or other similar containers used in the home canning of foods, whereby a person upon completion of the canning process may positively know whether or not the contents of the container have been properly sealed.

A further object of my tell tale closure which has sealing engagement with the neck at the open top of a transparent container, and which is adapted to be flexed inwardly within the container a sufficient distance by reason of the rarified condition therein to visibly indicate through the side of the container that the same is vacuum sealed.

A further object of the invention is to provide a tell tale closure device of rubber or other like distendable material to enable the device to freely distend under the presence of steam pressure within a sealed container to relieve the pressure upon the walls of the container to avoid the danger of the explosion of the container, and should the pressure tend to distend the device beyond its limit, it may burst without serious danger or loss other than loss of the device.

A still further object of the invention is the provision of a jar sealing and closure device which may be substituted for the present rubber gasket and closure cap to seal the jar air tight.

A still further object is the provision of a combined jar sealing and tell tale closure device having the above features which is simple and inexpensive of construction, and capable of relatively long life and use.

Other objects of the invention will appear as the following specification is read in conjunction with the accompanying drawing, in which

Figure 1 is a perspective view of a Mason screw cap type jar with the invention in normal position thereon.

Figure 2 is an enlarged detail vertical sectional view showing the combined sealing and tell tale

closure device in elevation and in a normal position.

Figure 3 is a view similar to Figure 2 but showing the closure device expanded outwardly by the steam pressure within the jar.

Figure 4 is a view similar to Figure 3, but illustrating the position of the tell tale closure device indicating a vacuum within the jar.

Figure 5 is a side elevational view of the sealing and tell tale closure device with part broken away in section.

Figure 6 is a vertical sectional view showing the use of the invention in normal position upon a wire clamp type of jar.

Referring to the drawing by reference characters, the numeral 10 designates my tell tale sealing closure in its entirety which is molded of rubber or other like flexible material which is impervious to air and moisture. The device includes a normally dome-shaped body portion 11 as shown in Figure 5, an upstanding outwardly flared annular wall 12, and an outwardly extending downwardly curved annular flange 13.

In Figures 1 to 4 inclusive, the telltale sealing and closure device 10 has been shown as applied to a transparent jar 14 of the Mason fruit jar type, the same having an externally screw threaded neck 15. The tell tale device 10 is placed upon the open top of the neck 15 with the flange 13 seated upon the periphery of the open top while the annular wall 12 extends within the neck so as to dispose the dome shaped body 11 therein as best illustrated in Figure 2. The wall 12 is of such height, that the flange 13 terminates on a plane substantially flush with the top of the normal position of the dome shaped body.

After positioning the device 10 upon the neck 15 in the manner just described, a metal ring gasket 16 is placed upon the top of the flange 13 to provide a metal to metal contact between the gasket and the metal screw retaining member 17 which has threading engagement with the external screw threaded neck 15. The top of the retaining member is provided with a central aperture 18 of the size substantially to that of the inner diameter of the ring gasket 16. When the retaining member 17 is screwed home, the top of the same bears downwardly upon the metal gasket 16, which in turn compresses the top of the flange 13 down upon the top of the walls of the neck 15 to retain the tell tale closure in position against accidental displacement.

In the art of canning food, it is the practice to fill the jar or container 14 with the food to be canned while the food is in a heated condition.

After the jar has been so filled, the tell tale closure 10 is placed upon the neck 15 in the manner hereinbefore explained, with the dome shaped body 11 in the normal position shown in Figures 3 and 5. After the retaining member 17 has been screwed home upon the neck 15 of the jar, the same may be said to be air-tightly sealed. If the contents placed into the jar are steaming hot as shown in Figure 3, a steam pressure will be built up within the jar which is relieved by reason of the inherent characteristics of the tell tale device which enables the dome shaped body 11 to be outwardly distended as shown in Figure 3. This relieves the jar of steam pressure which subjects the jar to the danger of breakage caused by explosion, and also eliminates the danger of injury to the operator. Upon cooling of the contents of the jar, a contraction of the contents takes place, which in turn reduces the air pressure in the space above the level of the contents. This difference between the rarified air within the jar and the outer atmosphere causes the atmospheric pressure to collapse or depress the dome shaped body 11, which is exposed to the atmosphere through the opening 18 in the retaining ring 17. This difference in pressure causes the inward flexing of the dome shaped body 11 to a position below the plane of the lower edge of the retaining ring 17, or to the position shown in Figure 4 of the drawing. This pressure against the normal dome shaped body 11 also acts upon the flange 13 to seal the same with the top of the jar, so that an airtight seal may be obtained even though the retaining member 17 and metal gasket 16 were dispensed with. Thus, a person looking inwardly through the opening 18, or by looking through the side of the transparent glass jar 14 may readily observe that the dome shaped body 11 has been reversed from its normal position, and the contents of the jar are air-tightly sealed. If, for any failure of the operator to air-tightly seal the interior of the jar from the atmosphere, the pressure would be the same as atmospheric pressure with the result that the tell-tale closure would not function. In the event that the seal between the tell tale closure and the jar should accidentally become broken after once being sealed, the inverted dome-shaped body 11 will return to its normal position shown in Figure 2. Thus, the operator or intended user of the jar is able to visibly determine whether the proper seal has been made and maintained before removing the contents for consumption. It will be appreciated that should the seal fail, the contents of the jar may become unfit for eating due to fermentation thereof, and the health and possibly the lives of those who might otherwise eat the contents will be spared.

In Figure 6 of the drawing, I have illustrated the use of my tell tale closure device 10 upon a jar 19, normally closed by a removable solid cap 20 and held closed by the well known wire bail clamp (not shown). The device 10 is positioned upon the jar 19 in the same manner as described in the use of the same upon Mason type jars, but in this use, the outward expansion of the dome shaped body 11 would be restricted by the cap. Otherwise, the function and result are the same as hereinbefore explained.

Although I have illustrated the use of the invention upon two well known types of jars, the same may be made in different sizes to fit mayonnaise and other commercial jars to adapt them for canning purposes and which jars might otherwise be thrown away.

By constructing the body portion of the tellcap of a normally concavo-convex configuration, it is possible for the same to be drawn down into the container the required indicating distance without reaching beyond the point of distortion, thereby insuring the device of longer life, and reducing the danger of breakage of the seal over long period of use and reuse. By normally positioning the concavo-convex body within the top and bottom planes of the annular wall of the tell cap, the underside of a solid closure cap such as shown in Figure 6 will not distort such normal position. This shape of body also enables the container to be substantially filled without possibility of the rubber cap coming in contact with the contents of the container.

By the use of this tell cap, it is possible for an observer to immediately tell by looking through the side of the container whether the contents are properly sealed. In instances where such sealed containers are stored upon shelves, the observer may detect any container not properly sealed without disturbing or handling the containers. Therefore, it is necessary that the concavo-convex body be flexed inwardly a sufficient distance to extend below the plane of the bottom of the metal retaining ring or other securing means employed for mechanically holding the tell cap in position.

While I have shown and described what I deem to be the most desirable embodiments of my invention, I wish it to be understood that various changes as come within the scope of the appended claims may be resorted to if desired.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A jar closure comprising in combination, a flexible sealing member, and means for securing the member in position on a jar, said sealing member including a ring-like portion normally positioned around the inner wall of the neck of the jar and a normally dome-shaped portion connected thereto, said ring-like and dome-shaped portions combining to form an enlarged concavo-convex body in response to pressure within the jar below that of atmospheric pressure exteriorly thereof, said body depending within the jar under predetermined pressure conditions to a position below the horizontal plane of the securing means to provide an indicator, visible through the walls of the jar, of the effective airtight condition of the sealing member.

2. A jar closure comprising in combination, a flexible sealing member, and means for securing the member in position on a jar, said sealing member including a ring-like portion depending within the jar and a concavo-convex portion connected thereto, said portions of the member being responsive to a lesser pressure within the jar than atmospheric pressure exteriorly thereof to combine in producing an enlarged concavo-convex body, said body depending below the horizontal plane of the securing means to constitute an indicator, visible through the walls of the jar, of the maintenance of a reduced pressure therein.

3. A jar closure comprising in combination, a flexible sealing member, and means for securing the member in position on a jar, said member including a dome-shaped portion normally positioned with its apex substantially on a horizontal plane with the upper edge of the jar and responsive to differences in pressure within the jar and atmospheric pressure exteriorly thereof to flex the dome-shaped portion outwardly or inwardly, the

position thereof being reversed on its inward movement with its base depending below the horizontal plane of the securing means to constitute an indicator, visible through the walls of the jar, of the air-tight condition of the member.

4. A jar closure comprising in combination, a flexible sealing member covering a jar opening and with its outer edges seated upon the edges of the opening, said sealing member including a normally dome-shaped portion, means for securing the member in position over said opening, and a metallic gasket interposed between the sealing member and the securing means to prevent contact between the last two elements, the dome-shaped portion of said sealing member being deformable into a reverse position down within the jar by a reduction in the pressure within the jar below that of atmospheric pressure to provide an indicator, visible through the walls of the jar, of the air-tight condition of the sealing member.

5. A jar closure comprising in combination, a flexible elastic sealing member, and means for securing the member in position upon a jar, said

member including a normally dome shaped portion, the inherent characteristics of said dome shaped portion enabling flexing of the same to a reverse position within the jar by reason of atmospheric pressure exteriorly of the jar and a pressure less than atmospheric pressure within the jar, to constitute an indicator visible through the walls of the jar of the air tight condition of said sealing member, and which by an equalization of pressure interior and exterior of said jar or a pressure within the jar greater than atmospheric pressure causes the reversed distorted portion of the dome shaped portion to return to normal position.

6. A vacuum responsive jar closure comprising a cup-shaped structure of flexible material having an upwardly convex shaped bottom which when subjected to the effect of vacuum in a jar is attracted to a position with its central portion underlying the plane of its peripheral portion indicating the presence of a vacuum condition inside of the jar.

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