Jan. 5, 1965 T. A. COCCHIARELLA 3,164,289

HERMETICALLY SEALABLE CONTAINER LID

Filed Dec. 14, 1962

FIG. 1

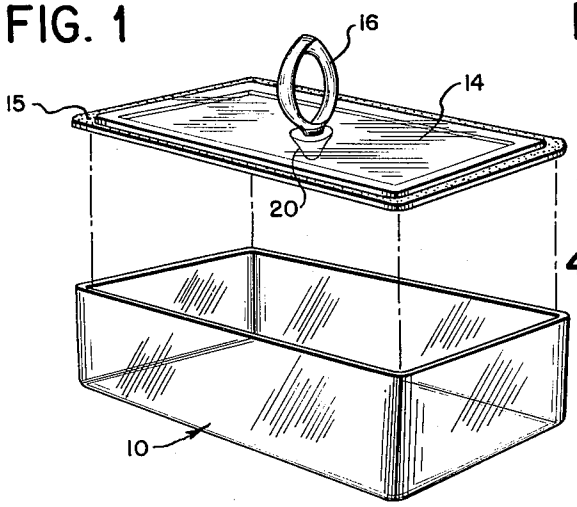


FIG. 3

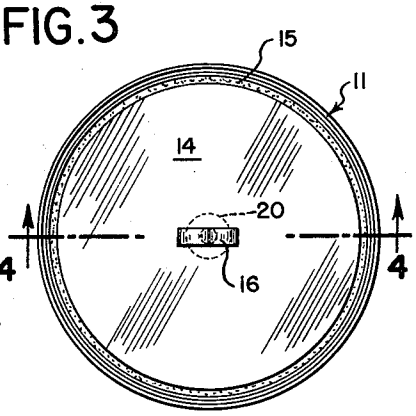


FIG. 2

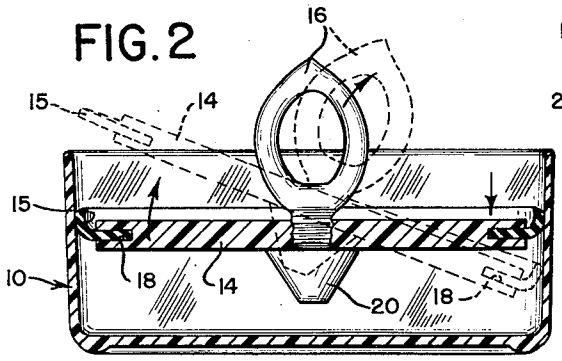


FIG. 4

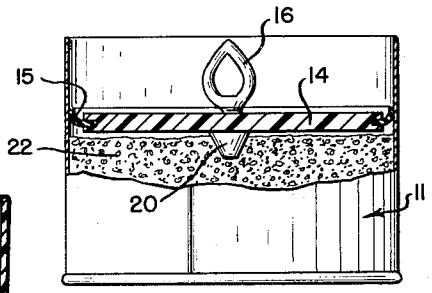


FIG. 5

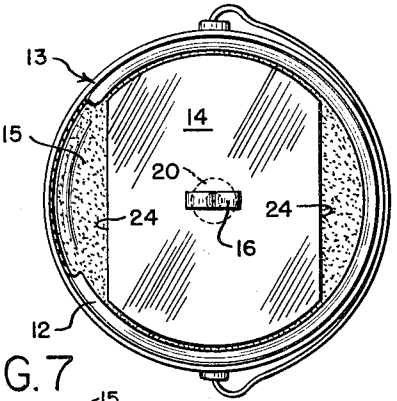


FIG. 6

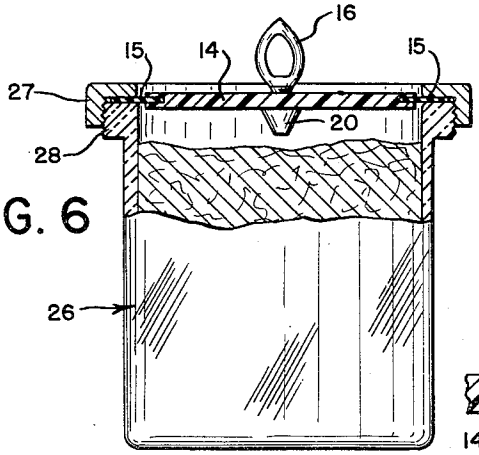
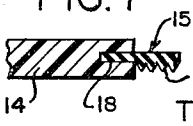


FIG. 7



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HERMETICALLY SEALABLE CONTAINER LID

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This invention relates to lids or covers for five-sided open top containers, and more particularly it relates to a reusable hermetically sealable lid for an open top container of the type having substantially smooth and non-converging interior walls.

Many products, both edible and non-edible, age rapidly or are otherwise adversely affected when exposed to air, and consequently these products are normally packaged for storage or sale in hermetically sealed containers. When such a hermetically sealed container is opened to remove a portion of the contents for use the hermetic seal is, of course, broken, and when the container is closed by replacing the cover or lid thereon the hermetic seal usually cannot be restored. Moreover, even though the hermetic seal is restored, a relatively large quantity of air is now contained in the now partly empty container in direct contact with the remaining portion of the product or commodity packaged therein. As a result a perishable product packaged in a container having a conventional container lid commences to age as soon as the original hermetic seal is broken and the aging proces continues even though the seal is later restored.

I have now devised a novel reusable and resealable lid for open top containers that will form a hermetic seal when used with containers having substantially smooth and non-converging interior side walls. My new lid will not only form a hermetic seal that excludes air from the container but will also expel excess air from the partly empty container and thereby prevent or drastically slow down aging of the product after a portion thereof has been removed from the container. The hermetically sealable lid of my invention comprises a centrally disposed main portion of substantially rigid sheet material the dimensions of which are slightly less than the interior dimensions of the horizontal cross section of the container with which the lid is used, and a gasket of resilient, substantially flat sheet material secured to the periphery of the main portion of the container lid. The resilient gasket is disposed substantially in the plane of the main portion of the lid, and the undersurface of the gasket is advantageously formed with at least one continuously extending rib disposed parallel to and spaced outboard of the periphery of the centrally disposed main portion. Moreover, lid lifting means are positioned on the upper surface of the main portion of the lid to facilitate removal of the lid from the container with which it is used.

My new hermetically sealable lid structure will be better understood from the following description in conjunction with the accompanying drawing of which

FIG. 1 is a perspective view of my hermetically sealable lid designed for use with a rectilinear open top container such as a plastic ice box tray,

FIG. 2 is a sectional view through a container to which my lid has been applied showing in outline how the lid is removed from the container,

FIG. 3 is a top view of a straight-sided cylindrical container, such as a coffee can, to which my reusable and resealable lid has been applied,

FIG. 4 is a sectional view along line 4—4 of FIG. 3,

FIG. 5 is a top view partly broken away of a cylindrical container having an inwardly extending lip or brim, such as a paint can, to which a modification of my resuable lid has been applied,

FIG. 6 is a side elevation partly broken away and in

section of an advantageous adaptation of my container lid and,

FIG. 7 is a fragmentary sectional view of one end of the lid showing the underside of the gasket formed with ribs or serrations.

My reusable and resealable container lid is adapted to be used in conjunction with open top containers having substantially smooth and non-converging interior side walls such as, for example, the rectilinear plastic container or ice tray **10** shown in FIGS. 1 and 2 and the cylindrical metallic container or coffee can **11** shown in FIGS. 3 and 4. A modification of my container lid can also be used in conjunction with containers having an inwardly extending lip or brim **12**, such as the paint can **13** shown in FIG. 5 of the drawing.

As shown best in FIGS. 1, 2, 4 and 6, my container lid comprises a centrally disposed main portion **14** formed from one or more pieces of substantially rigid sheet material, such as plastic or the like. The outside dimensions of main portion **14** are slightly less than the interior dimensions of the horizontal cross section of the container (that is, the cross section in a plane perpendicular to the normally vertical side walls of the container) with which the lid is adapted to be used. A gasket **15** of resilient, substantially flat sheet material, such as rubber or the like, is secured to the periphery of the main portion **14** of the lid, the resilient gasket being disposed substantially in the plane of the rigid sheet material from which the main portion **14** is formed. The outer dimensions of the gasket **15** are slightly greater than the interior dimensions of the horizontal cross section of the container with which the gasket is used. Moreover, lid lifting means, for example, the handle **16**, is positioned on the upper surface of the main portion **14** of the lid to facilitate removal of the lid from the container in a manner hereinafter described.

As previously mentioned, the outer dimensions of the main portion **14** of the lid are slightly less than, and the outer dimensions of the gasket **15** are slightly greater than, the interior dimensions of the horizontal cross section of the container with which the lid is used, the difference in size depending largely upon the size of the container and the thickness and resilient properties of the material from which the gasket **15** is made. In general, the difference in size or distance between the outer edge of the main portion **14** and the interior of the container ranges from about 1/16 to about 1/2 of an inch, and for the average ice box tray or coffee can the difference in size advantageously is from about 1/8 to about 1/4 inch. Similarly, the difference in size or distance between the outer edge of the gasket **15** and the interior of the container ranges from about 1/16 to about 1/4 of an inch. Of course, modification of the main portion **14** or the gasket **15** to adapt my lid for use with certain types of containers, for example the paint can **13**, may necessitate minor departures from the aforementioned differences in dimensions without departure from my invention.

In one embodiment of my invention the gasket **15** is a solid or uninterrupted sheet of resilient material cemented or otherwise secured to the underside of the main portion **14** of the lid, and in another embodiment the gasket **15** is sandwiched between two matching pieces of rigid sheet material which together make up the main portion **14** of the lid. However, as clearly shown in the drawing, in the preferred embodiment of my invention the rigid sheet material from which the main portion **14** is formed is thick enough to permit a groove or slot **18** to be formed about the periphery of the main portion of the lid, and the center portion of the gasket **15** is cut away. The width of the peripheral slot **18** is substantially equal to the thickness of the resilient sheet material from which the gasket **15** is formed so that the inner edge of the gasket will be

snugly received in the slot 18 as clearly shown in FIGS. 1 and 2. Moreover, in an advantageous embodiment of my lid structure shown in FIG. 7, the undersurface of the gasket 15 is formed with at least one and preferably two or more, continuously extending ribs or serrations 15*a* disposed parallel to and spaced outboard of the periphery of the main portion 14 of the lid.

The manner in which the container lid of my invention is placed on and removed from the container with which the lid is adapted to be used is best shown in FIGS. 1 and 2. Thus, the container lid is first positioned squarely over the open top of the container, as indicated in FIG. 1, and then it is pressed evenly down into the interior of the container, as shown in section in FIG. 2, by pressing firmly and evenly against the main portion 14 of the lid. As the lid is pressed downwardly into the container the outer edge of the resilient gasket 15 is forced upwardly so that the underside of the peripheral portion of the gasket bears firmly against the smooth interior side walls of the container, as clearly shown in FIG. 2. The firm contact between the under surface of the peripheral edge of the gasket 14 and the interior side walls of the container assures an airtight hermetic seal between the lid and the side walls of the container. Moreover, my container lid is advantageously pressed downwardly into the interior of the container until the underside of the lid comes into contact with the contents of the container, thereby expelling virtually all of the air from the container that would ordinarily be trapped in the empty space between the underside of a conventional lid or cover and the upper surface of the contents of the container.

Due to the hermetic seal and to the force of atmospheric pressure bearing against the outer surface of the lid, the container lid cannot easily be removed by drawing it evenly upwardly in the reverse of the manner in which it is installed. To remove the lid without difficulty the hermetic seal must first be broken, and this is accomplished by pressing down on one edge of the container lid while lifting up on the handle 16 as indicated by the arrows in FIG. 2 so as to "upset" the lid, as indicated in outline in FIG. 2, and thereby break the contact of the gasket 15 against one of the side walls of the container. Moreover, to prevent the container lid from being pressed flush against the bottom wall of the container, in which event it would be extremely difficult to "upset" the lid in order to break the hermetic seal, a knob or button 20 is advantageously provided on the undersurface of the main portion 14 of the lid as shown clearly in FIG. 2 of the drawing.

In the embodiment of my invention shown in FIGS. 3 and 4, my container lid is adapted to be used as a hermetically sealable closure for a conventional cylindrical container such as a coffee can 11. Ground coffee is a commodity that ages rapidly when exposed to the air, and therefore it is ordinarily packaged in hermetically sealed or "vacuum packed" metal containers. When the container or can 11 is first opened the hermetic seal is of course broken, and this hermetic seal cannot thereafter be restored. However, in accordance with my invention, after the original cover for the can is removed in the usual manner my container lid is pressed evenly down into the interior of the can until it comes into contact with the coffee 22 remaining in the can as shown in FIG. 4, thereby expelling air from the space above the coffee while at the same time establishing a hermetic seal about the peripheral edge of the gasket 15 of the container lid. When it is desired to remove the container lid in order to obtain an additional quantity of the coffee 22, the lid is "upset" in the manner previously described so that the hermetic seal between the gasket 15 and the side walls of the can 11 is broken. The lid can then be lifted out of the can, the desired quantity of coffee removed therefrom, and the lid replaced in the can to restore the desired hermetically sealed closure for the can.

In the embodiment of my invention shown in FIG. 5, my container lid is adapted to be used as a hermetically

sealable closure for a container 13 having an inwardly extending lip or brim 12. The inwardly extending brim 12 of the container 13 would ordinarily interfere with the insertion of a container lid of the type shown in FIGS. 3 and 4 into the container due to contact between the brim 12 and the main portion 14 of the container lid. To avoid this interference, small segments of the main portion 14 are cut away on opposite sides 24 of the container lid so that the lid can be tilted and inserted lower edge first into the interior of the container, whereupon the lid is restored to its normal position in a plane perpendicular to the side walls of the container 13 so that the gasket 15 will form the desired hermetic seal with the side walls of the container. To remove the lid, the lid is "upset" to break the hermetic seal in the manner previously described, and the lid is then withdrawn upper edge first from the can in the same manner as it was inserted therein.

In the embodiment of my invention shown in FIG. 6, my new container lid is used in conjunction with a threaded container 26 and a threaded annular ring 27 to form a "Mason jar" type of closure as clearly shown in the drawing. To form this closure threaded annular ring 27 is threaded on the corresponding threaded portion 28 on the outside of the upper edge of the container 26, the gasket 15 of my container lid extending between the upper edge of the container and the underside of the annular ring so that, when the annular ring is screwed down tightly on to the container, the gasket and main portion of my lid will form an air-tight closure for the container. When the annular ring 27 is removed, my container lid can be used as a vertically movable hermetic closure for the container 26 in the same manner as with the previously described embodiments of my invention.

The reference herein to containers having "substantially smooth and non-converging" interior side walls is not intended to exclude containers the side walls of which are slightly tapered from top to bottom. However, the taper or convergence of the side walls of the container should not be so great as to interfere with insertion of my container lid into the container or to prevent downward movement of the lid a substantial distance toward the bottom of the container. One of the important advantages of the preferred embodiment of my container lid structure is that the resilient gasket 15 is removable from the main portion 14 of the lid so that the gasket can be easily cleaned, or can be reversed to equalize wear, or can be replaced with a new gasket if required. In addition, as clearly shown in FIG. 2, in the preferred embodiment of my invention the lid lifting means or handle 16 can easily be removed to facilitate storage, shipping or stacking of the lids and of containers to which the lids have been applied. Other advantages of my new container lid structure will be apparent to those skilled in the art.

From the foregoing description of my invention it will be seen that my new container lid provides a reusable and hermetically resealable closure for containers with which the lid is designed to be used. Moreover, my container lid is adapted to expel virtually all of the air ordinarily present in the empty space between the underside of the container lid and the contents of the container so as to inhibit aging of the contents of the container due to the presence of such air in the container. Accordingly, it will be seen that I have made an important contributions to the art to which my invention relates.

I claim:

1. In combination with an open top container having substantially smooth and vertically nonconvergent interior side walls a reusable ad hermetically sealable lid for said container which comprises

(*a*) a centrally disposed main portion of substantially rigid imperforate sheet material the outer dimensions of which are less than the interior dimensions of the horizontal cross section of the container,

(*b*) a gasket of resilient, substantially flat sheet material capable of forming a hermetic seal against the

interior side wall of the container said gasket being secured to the periphery of the main portion of the lid and disposed substantially in the plane of said main portion, the outer dimensions of said gasket being greater than the interior dimensions of the horizontal cross section of the container, whereby the periphery of the gasket bears against the interior side wall of the container and bends upwardly to form a hermetic seal thereagainst when said lid is inserted in said container, and

(*c*) lid lifting means positioned on the upper surface of the main portion of the lid.

2. In combination with an open top container having substantially smooth and vertically nonconvergent interior side walls a reusable and hermetically sealable lid according to claim 1 in which there is a spacer knob positioned on the undersurface of the main portion of the lid near the center thereof.

3. The combination of an open top container having substantially smooth and vertically non-converging interior side walls, said container having an external threaded portion adjacent the upper edge of the container, an annular ring having internal threads corresponding to and engaging the external threads of the container, and a reusable and hermetically sealable lid for the container disposed in a plane perpendicular to the interior side walls of said container between the upper edge of the container and the annular ring, said container lid comprising

(*a*) a centrally disposed main portion of subbstantially rigid imperforate sheet material the outer dimensions of which are less than the interior dimensions of the horizontal cross section of the container,

(*b*) a gasket of resilient, substantially flat sheet material capable of forming a hermetic seal against the

interior side wall of the container, said gasket being secured to the periphery of the main portion of the lid and disposed substantially in the plane of said main portion, the outer dimensions of said gasket being greater than the interior dimensions of the horizontal cross section of the container, whereby the periphery of the gasket bears against the interior side wall of the container and bends upwardly to form a hermetic seal thereagainst when said lid is inserted in said container, and

(*c*) lid lifting means positioned on the upper surface of the main portion of the lid.

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