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(54) **CONTAINER LID EVACUATION DEVICE**

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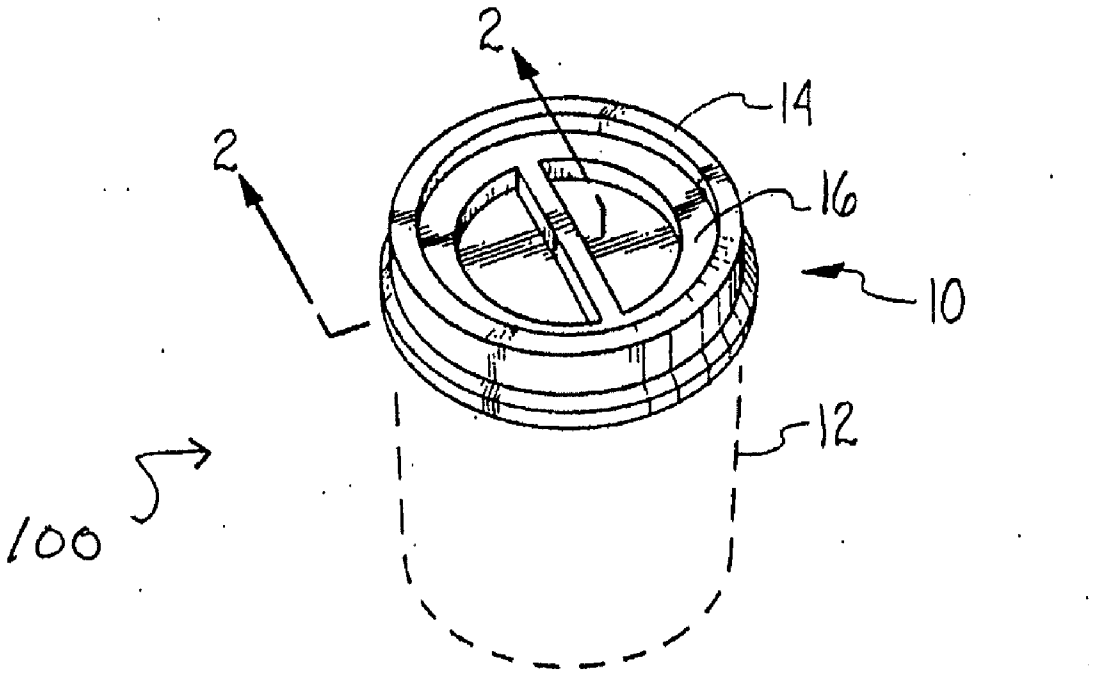
(57) **ABSTRACT**

A storage container device that is sealed to provide a controlled atmosphere to protect stored items from moisture and/or oxygen. Such a storage container device includes a storage container and a lid, where the lid is sized to be secured to the storage container, either through compression fit, threaded attachment, or a combination thereof. The lid further includes a valve that can be secured to a vacuum pump to evacuate the fluid contents of the container. Additionally, the valve may be used to introduce an inert gas, such as argon or nitrogen, into the container to preserve its contents. A plurality of storage container devices may be stackable, and a spacer may be used to facilitate stacking if the location of a valve would otherwise impede stacking.



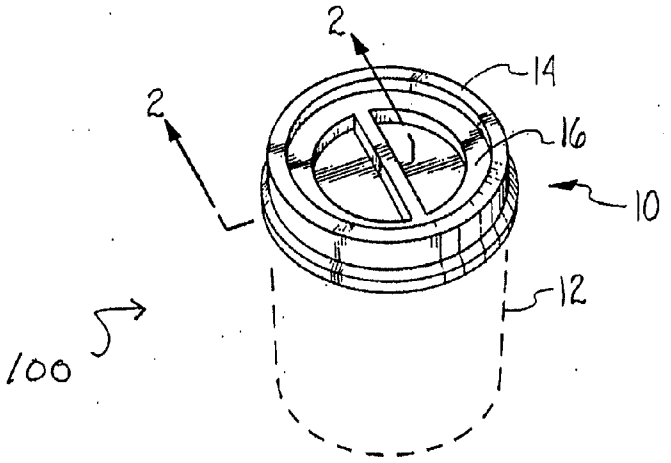

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Fig. 1

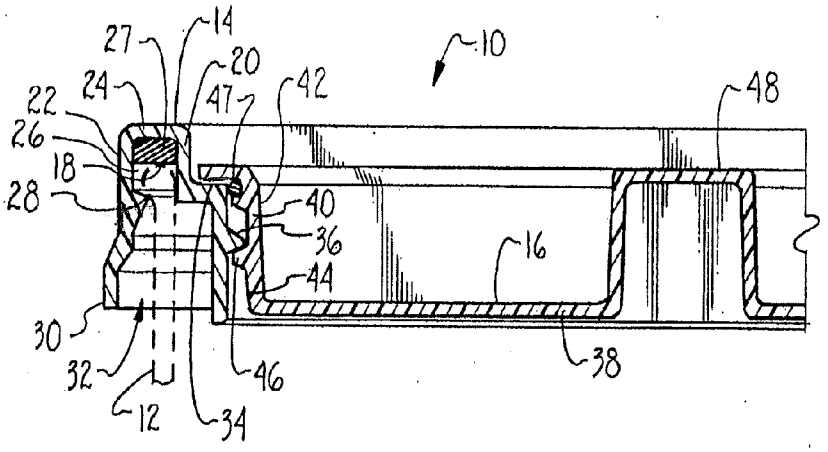
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Fig. 2

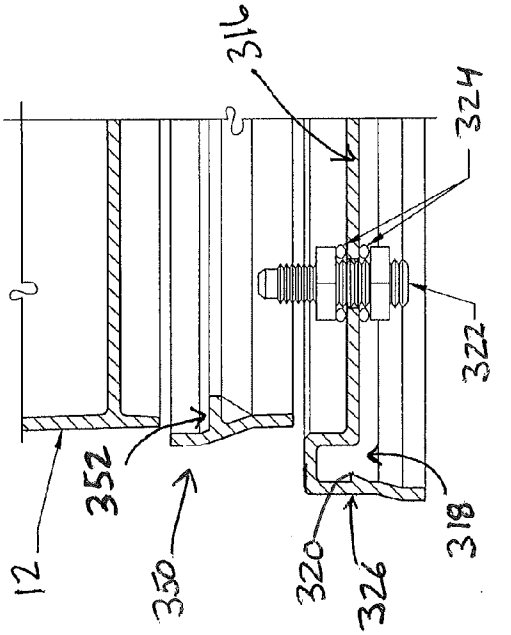

FIG. 5

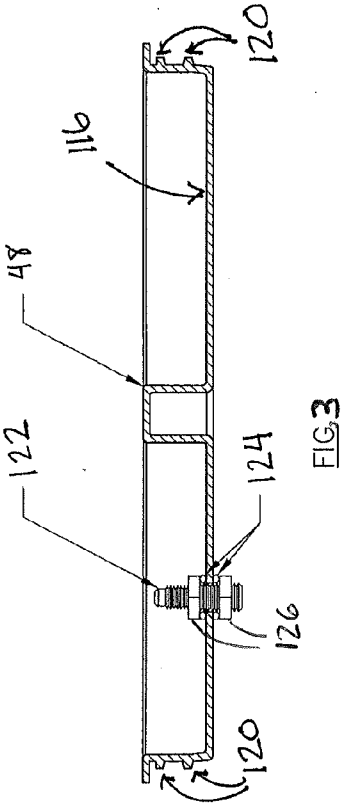

FIG. 3

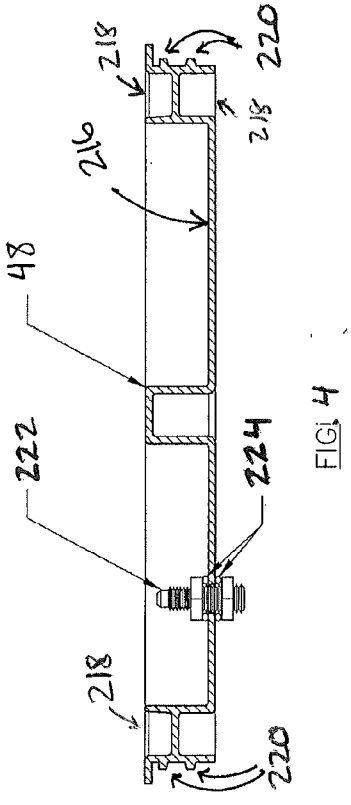

FIG. 4

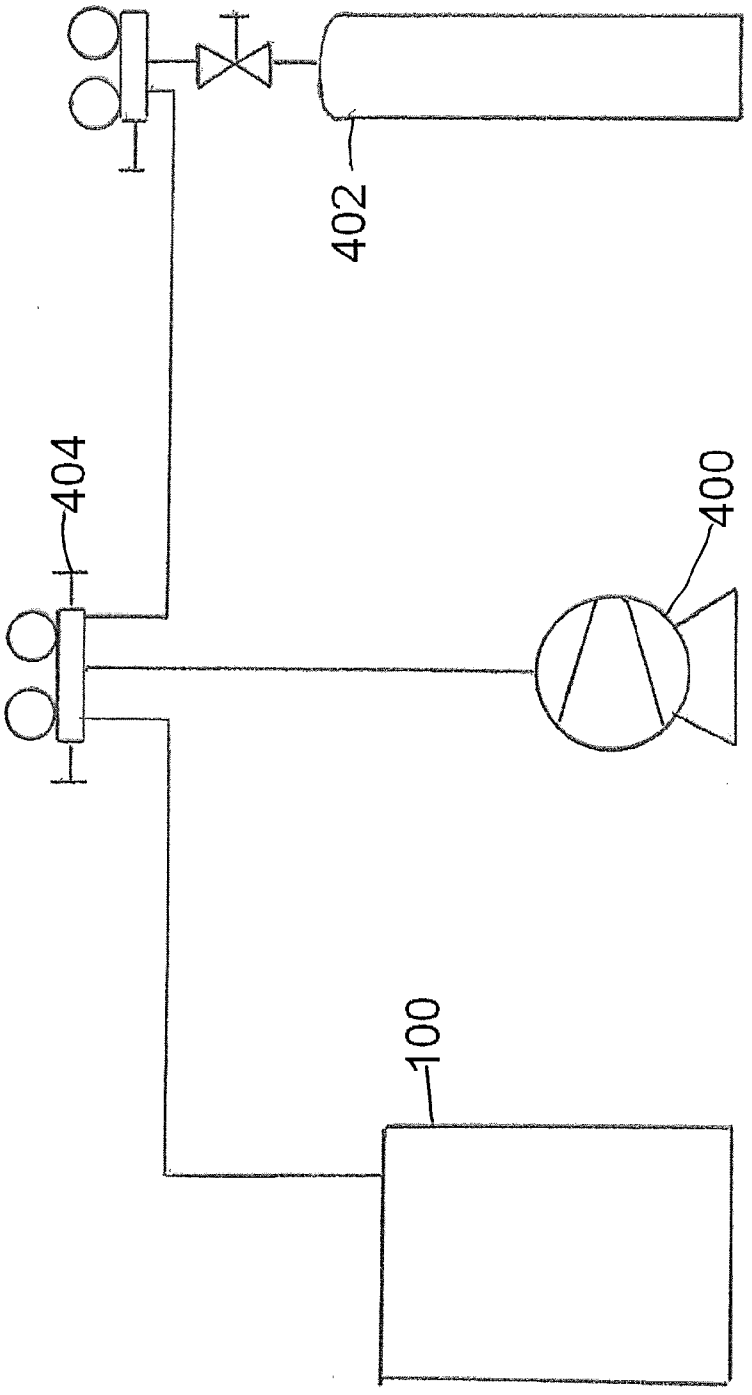

FIG. 6

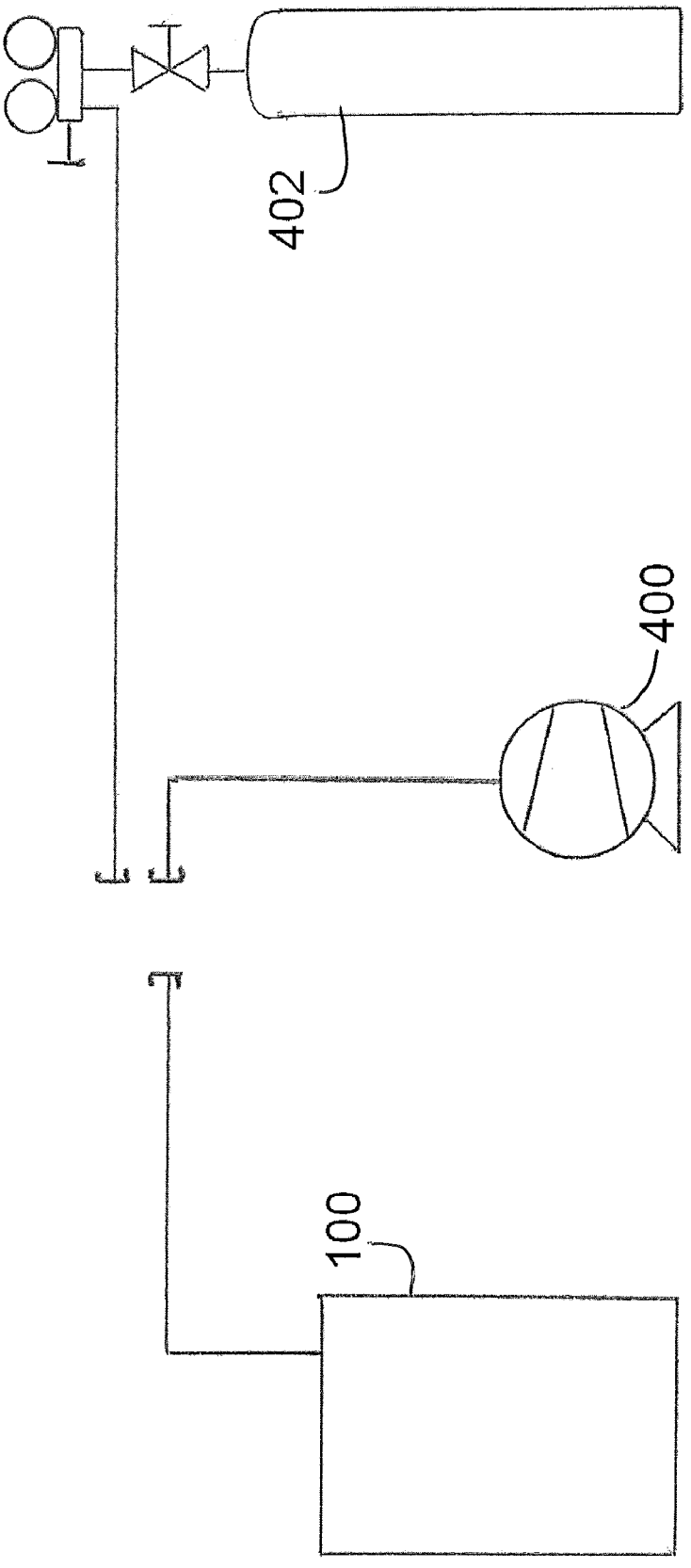

FIG. 7

CONTAINER LID EVACUATION DEVICE

PRIORITY

[0001] This application claims priority to and benefit of U.S. Provisional Application No. 61/326,046, filed Apr. 20, 2010, entitled "Container Lid Evacuation Device," the disclosure of which is incorporated by reference herein.

BACKGROUND

[0002] Preservation of food is accomplished by controlling and, where possible, destroying the agents of food spoilage. Food spoilage may be considered to be any organoleptic change—that is, any tactile, visual, olfactory, or flavor change that a consumer considers to be an unacceptable departure from the normal state. The agents of food spoilage are present in abundance, not only within food, but in the environments where foods are grown, harvested, processed, and stored. They can include microorganisms such as bacteria, larvae, worms, and mold or a wide variety of chemical and physical factors. Of particular importance are oxygen and moisture, which can degrade some food products in a short period of time. In particular, products such as grains, legumes, processed foods, or other suitable food items may be susceptible to degradation from oxygen and moisture. A number of preservation techniques, including canning, dehydration, refrigeration, the addition of chemical additives, and irradiation have been devised to stop the various kinds of food spoilage.

[0003] The freshness of many food products may be preserved by storing food in sealed containers. Various sizes and shapes of sealed containers are widely used to contain and store food away from the components of air, which may cause oxidation and moisture spoilage. These sealed containers are normally used, however, simply as closed vessels for holding the food away from exposure to air. When food is stored in a typical sealed container there may be accompanying air trapped within the sealed container along with any food contained therein. This accompanying air can still have detrimental effects on the enclosed food. Thus, it may be advantageous to store food in sealed containers that permit the evacuation of any remaining entrained air in the container. The evacuation of air and/or moisture may also destroy any organisms, such as insects or larvae that cannot always be removed during food processing, or at least reduce their ability to spoil food.

[0004] While food may be one such exemplary item that may be stored within a sealed container, other items may alternatively be stored within sealed containers. Some other exemplary items may include documents, valuable goods (such as jewelry or family heirlooms), or any other item that may be affected by oxidation or exposure to air.

[0005] While a variety of containers permitting the evacuation of stored fluid(s) have been made and used, it is believed that no one prior to the inventor has made or used an invention as described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] While the specification concludes with claims which particularly point out and distinctly claim the invention, it is believed the present invention will be better understood from the following description of certain examples taken in conjunction with the accompanying drawings. In the drawings, like numerals represent like elements throughout the several views.

[0007] FIG. **1** is a perspective view of an exemplary storage container device, including a lid;

[0008] FIG. **2** is a partial cross-sectional view of the exemplary storage container device of FIG. **1** as seen along line **2-2**;

[0009] FIG. **3** is a side cross-sectional view of an alternative closure mechanism that includes a lid and a valve for evacuating a fluid from inside a storage container;

[0010] FIG. **4** is a side cross-sectional view of another closure mechanism that includes an alternative lid and a valve for evacuating a fluid from inside a storage container;

[0011] FIG. **5** is a partial side cross-sectional view of a spacing mechanism to be used with a lid to permit the stacking containers;

[0012] FIG. **6** depicts a schematic view of a system comprising a vacuum pump, a storage container device, an inert gas source, and a two-valve charging manifold for evacuating and replacing a fluid from inside the storage container device; and

[0013] FIG. **7** depicts a schematic view of a system comprising a vacuum pump, a storage container device, and an inert gas source for evacuating and replacing a fluid from inside the storage container device.

[0014] The drawings are not intended to be limiting in any way, and it is contemplated that various embodiments of the invention may be carried out in a variety of other ways, including those not necessarily depicted in the drawings. The accompanying drawings incorporated in and forming a part of the specification illustrate several aspects of the present invention, and together with the description serve to explain the principles of the invention; it being understood, however, that this invention is not limited to the precise arrangements shown.

DETAILED DESCRIPTION

[0015] The following description of certain examples should not be used to limit the scope of the present invention. Other features, aspects, and advantages of the versions disclosed herein will become apparent to those skilled in the art from the following description, which is by way of illustration, one of the modes contemplated for carrying out the invention. As will be realized, the versions described herein are capable of other different and obvious aspects, all without departing from the invention. Accordingly, the drawings and descriptions should be regarded as illustrative in nature and not restrictive.

[0016] Versions of the present device comprise a storage container device having a means for evacuating fluid from inside the container, which may be used to prolong the freshness of the contents enclosed in the container. As will be described in greater detail below, the evacuation means may comprise, for example, a valve mounted onto a lid of the storage container. Such a valve may be coupled with a vacuum pump to remove any entrained air in the storage container. The valve may also be used to introduce a fluid into the container. By way of example only, a gas such as argon or nitrogen may be directed into the storage container to eliminate any oxygen or moisture that could damage the contents of the storage container. In addition, the introduction of an inert gas into the container may eliminate the potential for any organisms, such as worms, larvae, or bacteria, to harm the contents of the container device.

[0017] Referring to FIGS. **1-2**, one example of a storage container device (**100**) is shown. Because storage container

devices are conventional objects that are well known in the art, only a brief description of these kinds of devices will be provided. One such storage container device is disclosed in U.S. Pat. No. 5,207,345 (issued to Stewart et al., on May 4, 1993), which is herein incorporated by reference. In this example, the storage container device (**100**) comprises a storage container (**12**) or other base container and a closure mechanism (**10**) that is shown to be a lid-like member adapted to be installed on the storage container (**12**). The closure mechanism (**10**) may include a lid, and the lid may comprise an adapter (**14**) and a cover (**16**), though it should be understood that the adapter (**14**) and the cover (**16**) may be used individually or may be integrally constructed to form a single piece.

[0018] Referring now to FIG. **2**, the detailed structure of the closure mechanism (**10**) including the adapter (**14**) and the cover (**16**) is shown as installed on the storage container (**12**). The adapter (**14**) is sized and shaped to extend over the rim (**18**) of the storage container (**12**). If the storage container (**12**) has a round rim (**18**), then the adapter (**14**) will be a generally round piece as well. Likewise, if the rim (**18**) is rectangular, then the adapter (**14**) will be a rectangular piece. In the present example, the adapter (**14**) is preferably made from a slightly deformable or stretchable material such as a semi-rigid plastic, a semi-rigid rubber, or any other suitable material as will be apparent to those of ordinary skill in the art in light of the teachings herein. The adapter (**14**) has an inner skirt (**20**), an outer skirt (**22**), and a top portion (**24**) that connects inner and outer skirts (**20**, **22**). As shown in FIG. **2**, the skirts (**20**, **22**) and the top portion (**24**) form a recess (**26**). A first seal (**27**) is located within the recess (**26**). The first seal (**27**) is preferably a soft plastic or rubber material that can provide an airtight seal when compressed; however, the seal may be made from a variety of materials, including natural rubber, silicone, neoprene, polytetrafluoroethylene (or PTFE), or other suitable sealing materials and may be configured according to other suitable configurations as will be apparent to those of ordinary skill in the art in view of the teachings herein.

[0019] The outer skirt (**22**) comprises an integral ledge (**28**). The integral ledge (**28**) is configured to create a narrowing portion of the recess (**26**). The distal end of the outer skirt (**22**) has an outwardly extending portion (**30**), which is an extension of the outer skirt (**22**) deflected outward in a direction away from the storage container (**12**). It should be understood that the extending portion (**30**) is merely optional. The magnitude of the deflection and the length of the extending portion (**30**) may be configured to permit a prying tool, such as a screwdriver or a person's fingers, to enter a gap (**32**) between the extending portion (**30**) and the storage container (**12**). The inner skirt (**20**) includes a shoulder portion (**34**) and, in the present example, the shoulder portion (**34**) further comprises adapter threads (**36**). In the present example, adapter threads (**36**) are a helical ridge formed on shoulder portion (**34**). As those skilled in the art will appreciate, multiple standard threads configurations may be formed on the inner skirt (**20**) without departing from the scope of the present disclosure. Having a large single thread system, however, may provide easier and quicker threading. Alternatively, adapter threads (**36**) may be a helical v-shaped recess formed within shoulder portion (**34**) and configured to threadably couple to complementary threading on cover (**16**), as will be described herein.

[0020] As noted above, the closure mechanism (**10**) further comprises a cover (**16**), which is threadably attachable to the adapter (**14**). The cover (**16**) has a main portion (**38**) and an inverted-L-shaped annulus (**40**) extending from the main portion (**38**). The L-shaped annulus (**40**) has an inner side (**42**) and an outer side (**44**). The inner side (**42**) is fixably attached to the main portion (**38**). The outer side (**44**) comprises cover threads (**46**) complementary to adapter threads (**36**) on the inner skirt (**20**). The cover threads on the outer side (**44**) of the present example are a large channel that corresponds to the dimensions and pitch of the inward-facing ridge on the adapter (**14**). Alternatively, the cover threads (**46**) may be formed as a complementary helical ridge to couple with the v-shaped recess in the shoulder portion (**34**). The outer side (**44**) of the cover (**16**) further comprises a second seal (**47**) to provide an airtight seal when compressed. The second seal (**47**) may be made from a variety of materials, including natural rubber, silicone, neoprene, polytetrafluoroethylene (or PTFE, such as Teflon® of E. I. du Pont de Nemours and Company of Wilmington, Del.), a fluoroelastomer (such as Viton-A® of E. I. du Pont de Nemours and Company of Wilmington, Del.), nylon, or other suitable sealing materials and may be configured according to other suitable configurations as will be apparent to those of ordinary skill in the art in view of the teachings herein. While FIG. **2** shows the second seal (**47**) as an o-ring type seal, one of ordinary skill in the art will recognize that the second seal (**47**) may also be a disc-type seal or any other suitable seal. The main portion (**38**) of the cover (**16**) of the present example is formed to include a handle (**48**) having suitable dimensions to facilitate gripping and turning of the cover (**16**), though it should be understood that this feature is merely optional.

[0021] It should be understood that FIGS. **1-2** disclose only one example of a storage container device (**100**), and that any other suitable storage containers, lids, and/or accompanying components for storing food or other items may be utilized without departing from the scope of this disclosure. By way of example only, a storage container device may comprise any of the alternative embodiments, and features described therein, disclosed in U.S. Pat. No. 5,207,345 (issued to Stewart et al., on May 4, 1993), including containers having locking mechanisms, structural ribbing, and/or glides. In another example, the storage container (**12**) may comprise any container capable of storing food or other items (e.g., a piece of jewelry, currency, an antique, etc.) and having sufficient structural integrity to withstand some level of vacuum within the storage container, as will be appreciated by one of ordinary skill in the art. It should also be appreciated that the storage container (**12**) may be of any suitable size for containing foodstuffs or other items, and the storage container (**12**) may be formed out of any suitable metallic and/or non-metallic material, such as plastic, glass, or fiberglass, or combinations thereof.

[0022] In addition, as will be understood by one skilled in the art, the cover (**16**) and adapter (**14**) combination described above is but one version of a closure mechanism (**10**) that may be used to enclose a given storage container, and other features may be added or subtracted to the closure mechanism (**10**) without departing from the scope of the present disclosure. By way of example, the closure mechanism (**10**) may comprise a lid without an adapter. The lid may have an indented ridge along its perimeter similar to the L-shaped annulus (**40**) depicted in FIG. **2**, and the annulus (**40**) may have any suitable height to couple with the storage container (**12**). Alternatively, the lid may be substantially flat and have no annulus (**40**). The manner in which the lid couples with the

storage container (**12**) may also vary. For example, the lid may have threads (male or female) so that the lid can be threaded onto the storage container (**12**).

[0023] Referring now to FIGS. **3-5**, alternative closure mechanisms may be provided that comprise a component to evacuate air, moisture, or any other fluid from within a storage container. As shown in FIG. **3**, the closure mechanism comprises a lid (**116**) having a valve (**122**). The valve (**122**) may be any suitable valve known in the art that can be coupled to a vacuum pump, such as vacuum pump (**400**) as shown in FIG. **6**, to evacuate fluid from the interior of a storage container. By way of example only, the valve (**122**) may be a refrigerant access valve, such as a Schrader valve, and it may be of any suitable style, such as a bulkhead-style Schrader valve. In addition, the valve (**122**) may be coupled with any of the lids (**116**, **216**, **316**) or cover (**16**) herein described in any suitable manner. In the present example, the valve (**122**) is mounted onto the lid (**116**) with an epoxy, epoxy resin, or other sealant such as silicone RTV (room temperature vulcanizing). The valve (**122**) may further be sealed using an o-ring (**124**), which may be made from a polytetrafluoroethylene (such as Teflon®), a fluoroelastomer (such as Viton-A®), rubber, nylon, and/or combinations thereof or any other suitable material as will be apparent to one of ordinary skill in the art in light of the teachings herein. The lid (**116**) further comprises threads (**120**) that are configured to threadably attach to a container, such as container (**12**), or to an adapter, such as adapter (**14**).

[0024] Alternatively, as shown in FIG. **4**, an alternative lid (**216**) comprises recesses (**218**) between the main portion of the lid (**216**) and the exterior portion. The lid (**216**) also has a valve (**222**) that may be constructed and attached to the lid (**216**) in accordance with at least some of the teachings of valve (**122**) as described herein. Lid (**216**) further comprises threads (**220**) that are configured to threadably attach to a container, such as container (**12**), or to an adapter, such as adapter (**14**). The valve (**222**) may further be sealed using an o-ring (**224**), which may be made from a polytetrafluoroethylene (such as Teflon®), a fluoroelastomer (such as Viton-A®), rubber, nylon, and/or combinations thereof or any other suitable material as will be apparent to one of ordinary skill in the art in light of the teachings herein.

[0025] In yet another version, as shown in FIG. **5**, the lid (**316**) includes an outer skirt (**326**) that forms a recess (**318**) such that the lid (**316**) may be coupled with a storage container, such as storage container (**12**), by press-fit along the rim of the storage container. The lid (**316**) further comprises an inner ridge (**320**) on the outer skirt (**326**) to couple to a lip of a storage container to further secure the lid (**316**) thereto. The lid (**316**) also has a valve (**322**) that may be constructed and attached to the lid (**316**) in accordance with at least some of the teachings of valve (**122**) as described herein. The valve (**322**) may further be sealed using an o-ring (**324**), which may be made from a polytetrafluoroethylene (such as Teflon®), a fluoroelastomer (such as Viton-A®), rubber, nylon, and/or combinations thereof or any other suitable material as will be apparent to one of ordinary skill in the art in light of the teachings herein.

[0026] While FIGS. **3-5** show an o-ring seal, one of ordinary skill in the art will recognize that the o-ring may alternatively be a disc-type seal without departing from the scope of the present disclosure. In addition, while the valves (**122**, **222**, **322**) are shown in the figures as being coupled with lids (**116**, **216**, **316**), it should be understood that the valves (**122**, **222**, **322**) may be coupled to any other suitable location on the storage container device (**100**). By way of example only, the valves (**122**, **222**, **322**) may be coupled with the base or sidewall of the storage container (**12**).

[0027] To manufacture one of the exemplary closure mechanisms, such as the lid (**116**) utilizing a valve (**122**), a hole is first made in the lid (**116**). O-rings (**124**), as previously described, are placed coaxially to the hole on one or both sides of the lid (**116**). The valve (**122**) is then inserted through the hole. A retention feature (**126**), such as a threaded hex nut, is attached to the valve (**122**) on one side of the lid (**116**) and adjusted until a desired valve height is attained. Desired heights for the valve (**122**) can include the valve extending beyond the top-most surface of the lid (such as the valve (**322**) as seen in FIG. **5**), the valve being equal in height to the top-most surface of the lid, or the valve remaining below the top-most surface of the lid (such as the valves (**122**, **222**) as seen in FIGS. **3-4**). When the desired height for the valve (**122**) is set, a second retention feature (**126**), such as another threaded hex nut, is then attached to the valve (**122**) on the opposite side of the lid (**116**). This second retention feature can then be adjusted until the o-rings (**124**) compress and form an airtight seal such that there is no fluid communication through the hole in the lid (**116**) except through the valve (**122**). While the construction for one exemplary lid (**116**) has been described, one of ordinary skill in the art will readily be able to construct the other lids (**216**, **316**) in view of the teachings herein.

[0028] The lid (**116**) utilizing the valve (**122**) may be alternatively constructed using an epoxy, epoxy resin, or other sealant (such as silicone RTV) instead of o-rings (**124**). In this method, a hole is made in the lid (**116**). The valve (**122**) is then inserted through the hole. The valve (**122**) is then set to a desired height. A retention feature (**126**), such as a threaded hex nut, may be attached to the valve (**122**) on one side of the lid (**116**) and adjusted until a desired valve height is attained. When a desired height is set, a second retention feature (**126**), such as another threaded hex nut, can be attached to the valve (**122**) on the opposite side of the lid (**116**). Once the position of the valve (**122**) is set, an epoxy, epoxy resin, or other sealant (such as silicone RTV) is applied to one or both sides of lid (**116**) such that there can be no fluid communication through the hole in the lid (**116**) except through the valve (**122**). One further method to set the desired height for the valve (**122**) can include the use of a jig to fix the positions of both the lid (**116**) and the valve (**122**) while an epoxy or sealant is applied and allowed to cure. In this method, the epoxy or sealant may flow into and seal any gaps where the valve (**122**) is mounted.

[0029] One of ordinary skill in the art will recognize that the foregoing methods of manufacturing the lid (**116**) having a valve (**122**) and o-rings (**124**) or an epoxy, epoxy resin, or other sealant (such as silicone RTV) may also be applied to a storage container (**12**) having a valve (**122**). Moreover, it should be understood that the o-rings (**124**) and the epoxy or sealant may both be used to further ensure a proper seal is formed.

[0030] To use the storage container device (**100**), food (such as legumes, grains, or processed foods) or any other contents to be preserved are placed into the storage container (**12**). A closure mechanism (**10**) such as a lid (**116**, **216**, **316**), or a cover (**16**) and adapter (**14**) is coupled to the storage container (**12**) to restrict entry of any additional solid objects. As shown in FIG. **6**, a vacuum pump (**400**), such as an electric

or hand-operated vacuum pump, is coupled to a two-way charging manifold (**404**). A gas storage tank (**402**) is also coupled to the two-way charging manifold (**404**). The two-way charging manifold (**404**) is then coupled to the valve (**122**) to facilitate the evacuation of any fluid within the storage container device (**100**). Once the container device (**100**) is evacuated, the interior atmosphere of the storage container device (**100**) may be replaced with an inert gas, such as nitrogen or argon, at atmospheric pressure from the gas storage tank (**402**). In this way, the inert gas may further displace any remaining oxygen or moisture within storage container device (**100**), allowing the contents of storage container device (**100**) to be sustained and protected from external environmental conditions and/or any harmful organisms that might have existed in storage container device (**100**). Of course, the atmosphere of the storage container device (**100**) may be vacuumed out without replacing the interior atmosphere. Alternatively, as shown in FIG. **7**, the two-way charging manifold (**404**) may be omitted. In this configuration, the vacuum pump (**400**) is first coupled to a line connected to the valve (**122**). The vacuum pump (**400**) is activated to evacuate the fluid atmosphere from within the storage container device (**100**). Once most of the fluid atmosphere has been removed, the line connected to the valve (**122**) is disconnected and coupled to a line for the gas storage tank (**402**). A valve on the gas storage tank (**402**) is then opened to permit the inert gas to fill the storage container device (**100**).

[0031] Referring to FIG. **5**, the preservation system described herein may further comprise the capability for stacking a plurality of storage container devices (**100**), each comprising a storage container (**12**) and a closure mechanism (**10**). The closure mechanism may include a lid (**116**, **216**, **316**) or a cover (**16**) and an adapter (**14**). In the present example, each lid (**316**) comprises a valve (**322**). The stacking may be accomplished such that the locations of the valves (**322**) do not interfere with stacking the storage container devices (**100**). By way of example, FIG. **5** depicts a valve (**322**) coupled to a lid (**316**). Because, in this example, the valve (**322**) extends from the lid (**316**) at a height greater than that of the top-most portion of the lid (**316**), the valve (**322**) may impede the ability to stack another object, such as another storage container device (**100**), on top of the lid (**316**).

[0032] To remove this impedance, a spacer (**350**) is positioned over the lid (**316**) and the valve (**322**) and between the lid (**316**) and the base of another storage container (**12**) or any other item to be stacked on top. If the lid (**316**) is round, then the spacer (**350**) will be generally round as well. Likewise, if the lid (**316**) is rectangular, then the spacer (**350**) will also be rectangular. In the present example, the spacer (**350**) has an inner and an outer surface. The spacer (**350**) further comprises a ledge (**352**) located on the inner surface. In this way, a second storage container device (**100**) or a second storage container (**12**) may be stacked on top of the first storage container device (**100**) having a protruding valve (**322**) by positioning the spacer (**350**) over the lid (**316**) and positioning the second storage container (**12**) or the second storage container device (**100**) over the spacer (**350**). In this configuration a top portion of the spacer (**350**) will surround a lower portion of the sidewall of the second storage container (**12**). The bottom portion of the spacer (**350**) may be configured to fit within a ridge of a lid on to which the spacer (**350**) is placed. The spacer (**350**) may be fashioned from any suitable material, such as a plastic, polyethylene, wood, metal, or other rigid materials to allow the stacking of storage container devices (**100**) when using lids (**316**) that have a valve (**322**) that protrudes out.

[0033] As noted above, the various versions of the storage container devices (**100**) described herein, including but not limited to the various versions of closure mechanisms (**10**) described herein, may be used to store and preserve the food contents of the storage container device (**100**) by evacuating any entrained air from the interior of the storage container device (**100**). Of course, the storage container device (**100**) may be used with any other type of contents, food or otherwise. For example, jewelry or other precious items may be stored in the storage container device (**100**) to prevent tarnishing from exposure to ambient air and/or moisture. Other items that may be stored in the storage container device (**100**) include, without limitation, an important document (e.g., an insurance policy, will, picture, stock certificate, bond, marriage certificate, etc.), currency (e.g., gold, silver, paper money, etc.), an antique, family heirloom, garden seed, a firearm, a first aid product, medicine, an electronic device, freeze-dried food, and dehydrated food. Still other various settings and combinations in which a storage container device (**100**) and/or closure mechanism (**10**) may be used will be apparent to those of ordinary skill in the art in view of the teachings herein.

[0034] While several storage container devices, and components thereof, have been discussed in detail above, it should be understood that the components, features, configurations, and methods of using the devices discussed are not limited to the contexts provided above. In particular, components, features, configurations, and methods of use described in the context of one of device may be incorporated into any of the other container devices. The storage container devices (**100**) described herein includes storage containers (**12**) and closure mechanisms (**10**) having various sizes and geometries. For example, some storage container devices (**100**) may be designed with small, medium, or large storage containers (**12**) and correspondingly sized closure mechanisms (**10**).

[0035] It should also be understood that the components, features, configurations, and methods of use described in the context of one of the closure mechanisms may be incorporated into any of the other closure mechanisms. Still other additional and alternative suitable components, features, configurations, and methods of using the above-described container devices will be apparent to those of ordinary skill in the art in view of the teachings herein.

[0036] Having shown and described various versions in the present disclosure, further adaptations of the methods and systems described herein may be accomplished by appropriate modifications by one of ordinary skill in the art without departing from the scope of the present invention. Several of such potential modifications have been mentioned, and others will be apparent to those skilled in the art. For instance, the examples, versions, geometrics, materials, dimensions, ratios, steps, and the like discussed above are illustrative and are not required. Accordingly, the scope of the present invention should be considered in terms of the following claims and is understood not to be limited to the details of structure and operation shown and described in the specification and drawings.

What is claimed is:

1. A storage container device comprising:

(a) a container having an interior cavity;

(b) a lid securably attachable to the container, wherein the lid is further configured to form an airtight seal with the container; and

(c) a refrigerant access valve coupled to the lid and extending through the lid, wherein the refrigerant access valve is configured to be in fluid communication with a vacuum pump, and wherein the refrigerant access valve facilitates the evacuation of a fluid from the interior cavity of the container device when the vacuum pump is activated;

wherein the refrigerant access valve is configured to permit fluid transfer between the interior cavity of the container and an external apparatus.

2. The storage container device of claim **1**, wherein the refrigerant access valve comprises a Schrader bulkhead-style valve.

3. The storage container device of claim **1**, further comprising an o-ring and a retention member, wherein the retention member is coupled to the refrigerant access valve, wherein the o-ring is coaxial to the refrigerant access valve and is retained against the lid by the retention member, and wherein when the o-ring is compressed by the retention member the o-ring fluidly seals the refrigerant access valve to the lid.

4. The storage container device of claim **1**, wherein the lid comprises a cover and an adapter, wherein the adapter is securably attachable to the container and the cover is securably attachable to the adapter, and wherein the refrigerant access valve is coupled to the cover and extends through the cover.

5. The storage container device of claim **4**, wherein the adapter comprises an inner skirt, a top portion, and an outer skirt, collectively defining a recess, wherein the outer skirt comprises a recess-side surface, wherein a portion of the recess-side surface comprises an integral ledge, and wherein the recess and the integral ledge are configured to cooperatively couple the adapter to a container.

6. The storage container device of claim **5**, wherein the cover comprises threads and wherein the inner skirt of the adapter comprises complementary threading wherein the cover threadably attaches to the adapter.

7. A closure mechanism to be used with a container having an interior cavity, the closure mechanism comprising:

(a) a lid securably attachable to a container, wherein the lid is further configured to form an airtight seal with the container; and

(b) a refrigerant access valve coupled to the lid and extending through the lid, wherein the refrigerant access valve is configured to be in fluid communication with a vacuum pump, and wherein the refrigerant access valve facilitates the evacuation of a fluid from the interior cavity of the container when the vacuum pump is activated;

wherein the refrigerant access valve is configured to permit fluid transfer between the interior cavity of the container and an external apparatus.

8. The closure mechanism of claim **7**, wherein the refrigerant access valve comprises a Schrader bulkhead-style valve.

9. The closure mechanism of claim **7**, further comprising an o-ring and a retention member, wherein the retention member is coupled to the refrigerant access valve, wherein the o-ring is coaxial to the refrigerant access valve and is retained against the lid by the retention member, and wherein when the o-ring is compressed by the retention member the o-ring fluidly seals the refrigerant access valve to the lid.

10. A system for preserving items, the system comprising:

(a) a plurality of containers, wherein each container of the plurality of containers comprises a base and a sidewall, collectively defining a cavity;

(b) a plurality of lids, wherein each lid of the plurality of lids is securably attachable to a container of the plurality of containers, and wherein each lid comprises a refrigerant access valve coupled to the lid and extending through the lid; and

(c) at least one spacer, wherein the spacer is configured to be placed on a first lid of the plurality of lids secured to a first container of the plurality of containers, and wherein the spacer is configured in such a way that when a second container of the plurality of containers is placed on the spacer the refrigerant access valve coupled to the first lid does not contact the base of the second container.

11. The system of claim **10**, wherein at least one of the refrigerant access valves comprises a Schrader bulkhead-style valve.

12. The system of claim **10**, further comprising a vacuum pump, wherein the vacuum pump is configured to be in fluid communication with at least one of the refrigerant access valves, and wherein the vacuum pump is configured to facilitate the evacuation of a fluid from a cavity of a container of the plurality of containers.

13. The system of claim **10**, wherein the at least one spacer comprises a top portion, wherein each container of the plurality of containers has a geometric cross-section substantially near the base of each container, and wherein the top portion is configured to substantially correspond to the geometric cross-section of the container in such a way that the top portion of the spacer surrounds a portion of the sidewall of the container substantially near the base of the container.

14. The system of claim **13**, wherein the at least one spacer further comprises an inner surface, wherein at least a portion of the inner surface has an integral ledge.

15. The system of claim **10**, wherein the at least one spacer comprises a bottom portion, wherein each lid of the plurality of lids has a geometric shape, and wherein the bottom portion is configured to substantially correspond to the geometric shape of the lid.

16. The system of claim **10**, wherein the at least one spacer comprises an annular ring, wherein the annular ring comprises an inner surface, wherein at least a portion of the inner surface has an integral ledge.

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