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C. H. HANSEN

2,027,430

CONTAINER

Filed Oct. 17, 1933

Fig. 1.

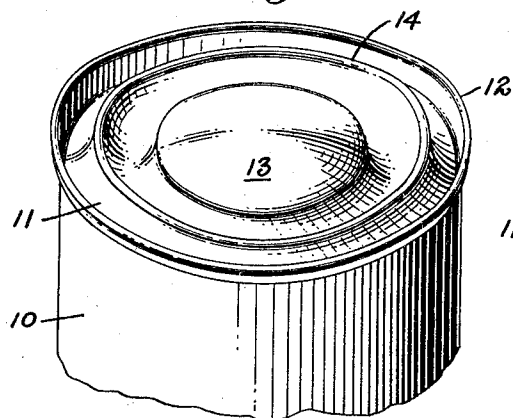


Fig. 2.

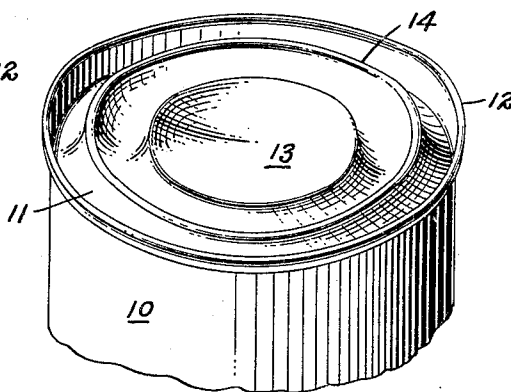


Fig. 3.

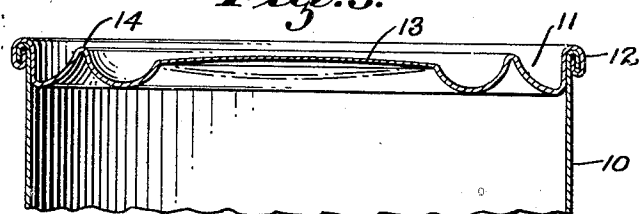


Fig. 4.

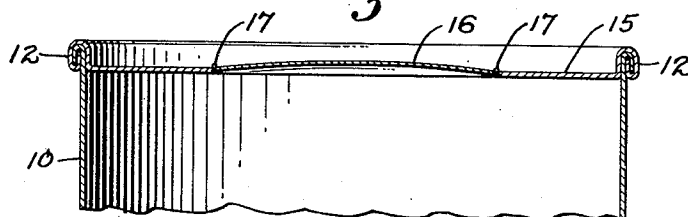


Fig. 5.

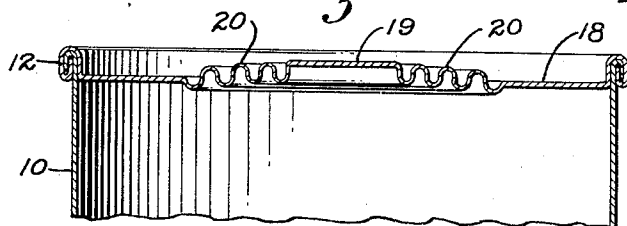
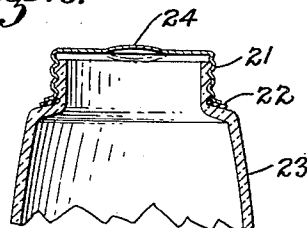


Fig. 6.



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CONTAINER

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4 Claims. (Cl. 220—66)

The present invention relates generally to a container of the type used for shipping foodstuffs and more specifically to an improvement in such a container which will make it possible to determine the pressure condition within the container and render it particularly adapted for use in shipping perishable products packed by the "Pressure Pack" method.

An object of the invention is to provide an improvement in a container of the type used for the shipment of foodstuffs under pressure, whereby the pressure condition within the container may be tested at any time in a simple and convenient manner.

Another object of the invention is to provide an improved construction in a can end for use upon a can of the type commonly used in shipping foodstuffs under pressure.

A further object of the invention is to provide a container which can be used with the method of packing perishable food products disclosed in my copending application for Letters Patent, entitled Container and method of packing, filed December 19, 1931, Serial Number 582,188.

Other objects and advantages of the invention will be in part evident and in part pointed out as the description thereof proceeds.

The invention, in its broadest aspect, consists in providing, in the wall of a sealed container, a pressure responsive portion which will assume a convexed or concaved position as determined by the pressure within the container. In its more specific aspect, the invention resides in the provision of a portion on the end or cover of a container which is offset to one side of the surrounding area of the end or cover and is adapted to be pushed or forced into an offset position at the other side of the surrounding area where it will remain, until pushed back to its original position by a predominating pressure.

For a more complete and better understanding of the invention reference should be had to the accompanying drawing, wherein there is shown by way of illustration and not of limitation preferred embodiments thereof.

In the drawing;

Figures 1 and 2 are fragmentary perspective views of a sealed container having a cover constructed in accordance with this invention with the pressure condition indicating portions showing respectively a pressure and a no pressure condition within the container.

Figure 3 is a full size fragmentary sectional view showing the configuration of the preferred

form of a can top, illustrated in Figures 1 and 2 of the drawing,

Figure 4 is a full size fragmentary sectional view showing a simplified form of a can top embodying the invention,

Figure 5 is a full size fragmentary sectional view showing a further modification of a can top embodying this invention, and

Figure 6 is a fragmentary sectional view showing the invention embodied in a screw cap for a so-called "Mason" preserving jar.

In Figures 1 and 2 of the drawing there is shown a container of the type most commonly used for shipping and preserving perishable products. This container is an ordinary tin or sheet metal can 10 having a cover 11 of special construction. The cover 11 is secured upon the can 10 by a folded seam 12, such as is formed by any of the well known automatic seaming and sealing machines now in use in this art.

In addition to other features to be hereinafter pointed out, the cover 11 has a convexo-concaved or dome-shaped portion 13 that can be flexed into a concavo-convexed position by the application of pressure thereupon. This portion 13, in accordance with the invention, is so formed that it will remain in the position to which it is last flexed. When constructed in this manner, the cover 11 will be found particularly well suited for use in connection with the pressure packing process which forms the subject matter of my above identified application for Letters Patent. Stated briefly, the method disclosed in my earlier application contemplates the evacuation of a packed container in the presence of a solid gas producing ingredient and the sealing of the container before the gas producing ingredient has completely sublimed. In carrying out this method, in its simplified form, the container is first charged with the product to be preserved. A piece of carbon dioxide is also deposited within the container. After the container is thus charged it is subjected to evacuation to remove all of the air. During this latter step some of the solid carbon dioxide will sublime, but before it has completely sublimed the container is sealed. The result is an evacuated air free container having a preserving gas under pressure therein, the pressure being produced by a sublimation of the carbon dioxide remaining in the container after it is evacuated and sealed.

When a cover 11 having a convexo-concaved portion 13, as illustrated and described, is used with the above method of packing, the portion 13 will be concavo-convexed as the container is

removed from the evacuating machine, but after a short time the evolution of gas, due to sublimation of the solid carbon dioxide, will create a pressure within the container and force the portion 13 into a convexo-concaved position to thus indicate the existence of a gas pressure within the container. This position of the portion 13 will be maintained as long as the container is not damaged and does not develop a leak. If the cover 11 is provided with a portion 13, having no definite bias in one direction or the other, the absence or presence of a pressure within the container can be easily determined at any time by pressing in on the portion 13 with the finger. If the portion 13 snaps out, after being thus pressed in, this will be evidence of a pressure within the container and that the container is in proper condition to preserve its contents, whereas if the portion 13 fails to snap back, and remains in the concavo-convex position, it will be an indication that the container has developed a leak and allowed the pressure or preserving gas to escape from the container. In this latter event the consumer will reject the container and insist upon one which will show a pressure of gas within.

From the above it will be seen that, when a container is constructed as described and used with my previously outlined method of packing, the condition of the container, in so far as its gas retaining properties are concerned, can be tested at any time in a simple, convenient and effective manner.

The invention may be embodied in any type of container and can be applied in a number of different ways which will suggest themselves to those skilled in the art. When the invention is embodied in the end of an ordinary can, such as is illustrated in the drawing, it will be found desirable to form the cover 11 with a depressed or countersunk area so that the portion 13 will not be exposed to damage or contact with other cans when stacked. The cover 11, when applied to the can 10, will be secured thereupon in an automatic seaming machine which operates to fold the end wall of the can 10 and edge of the cover 11 into overlapping engagement, as is well known. Such a seam can be rendered air-tight by solder or it may be formed over a rubber gasket or compound, in accordance with the well known method. While this seam is very strong and seldom develops a leak, it is important that no unnecessary strain be placed thereupon. Therefore, as a precaution in this direction, the cover 11 is shown as having an annular reinforcing ridge or rib 14 which is disposed between the seam 12 and the portion 13. This ridge 14 prevents any straining of the cover at the seam when the portion 13 is flexed, as contemplated. The cover 11 can be made without the ridge 14, but where the container will be subjected to rough handling it will be found desirable.

In Figure 4 of the drawing there is illustrated a cover 15 having an extremely flexible convexo-concaved portion which can be formed by reducing the thickness of the cover at its center or by inserting a separate disk 16, as shown. The disk 16 is formed of a separate piece and may be made of steel, bronze or any flexible material. If it is of metal it can be soldered or welded to the cover 15, as indicated at 17. If it is of rubber, fibre or the like it can be secured in any suitable manner. Inasmuch as the disk 16 is to be considerably more flexible than the surrounding portion of the cover, it will not be necessary to

provide a reinforcing or stiffening rib 14, as is shown in Figures 1, 2 and 3 of the drawing.

The disk 16, like the indicating portion 13 above described, may be formed with a definite bias in one direction that will cause it to always assume a predetermined position when it is not subjected to a controlling pressure condition, or it may be formed without such a bias, in which event it will always remain in the position to which it is last moved.

In Figure 5 of the drawing there is shown a more elaborate arrangement, wherein a cover 18 is provided with a pressure indicating portion 19 which is carried by a series of corrugations 20. As here shown, the portion 19 and the corrugations 20 are formed integral with the cover 18 and, as a result, the metal will be stretched in forming the corrugations and produce a flexibility therein which will make unnecessary a reinforcing rib, as is provided in the embodiment of the invention first above described. If desired the portion 19 and the corrugations 20 may be formed as a separate piece and then mounted upon the cover 17 in any suitable manner. In this embodiment, like those previously described, the portion 19 may or may not be provided with a definite bias in one direction.

An inspection of the drawing will show that in each of the above described embodiments of this invention the indicating portion is disposed below the extreme end of the can 10. This is to permit a stacking of the cans and to also avoid damage to the indicating portions.

Upon referring to Figure 6 of the drawing, it will be seen that the invention is not limited to containers of the can type. As here shown the invention is embodied in a screw cap 21, such as is commonly used in conjunction with a rubber gasket 22 to seal a so-called Mason jar 23. In this embodiment a resilient or flexible portion 24 is provided centrally in the top of the screw cap 21.

The operation of the invention in its several embodiments may be described as follows:

When the pressure indicating means is without a definite bias to one position, as in the embodiment first above described, and is used in connection with a pressure packed container, the presence of a pressure within the container can be determined by pressing in on the flexible portion. If a pressure exists within the container the flexible portion will be forced out into its original position as soon as the external pressure is removed. On the other hand, if the container has leaked and lost its pressure of gas or air, the flexible portion will remain in its inward position and thus indicate that no pressure exists within the container.

At the present time if a consumer, after purchasing a can of foodstuffs packed by the pressure pack process, wishes to determine whether the can has maintained the proper condition of pressure on the foodstuffs during storage and in transit, this can be done by listening for an exhaust of air or gas when the can is first vented in the initial opening operation. This procedure requires that the container be opened and in the case of a dispute, as to the condition of the container at the time of sale, the dealer will have nothing but the consumer's word for the facts, whereas when the container is equipped with a pressure indicating means, as contemplated by this invention, it will be possible for the dealer to determine definitely the pressure condition of a container before it is turned over to a consumer.

If the container has developed a leak the indicating means will disclose the fact. The defective container can then be returned directly to the packer who should stand the loss due to leakage developed by rough handling in transit or resulting from an imperfect sealing of the container.

While I have, for the sake of clearness and in order to disclose the invention so that the same can be readily understood, described and illustrated specific devices and arrangements, I desire to have it understood that this invention is not limited to the specific means disclosed, but may be embodied in other ways that will suggest themselves, in view of this broad disclosure, to persons skilled in the art. It is believed that this invention is broadly new and it is desired to claim it as such so that all such changes as come within the scope of the appended claims are to be considered as part of this invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A container for foodstuffs packed by a vacuum and pressure process having a combined vacuum and pressure indicating flexible portion formed in a wall thereof, said indicating flexible portion being adapted to move freely into either one of two positions in response to pressure applied to one side thereof and having such inherent characteristics as to cause it to remain in either one of said two positions to which it is last moved until a predominating external pressure is applied to the other side thereof.

2. A container for foodstuffs packed by a combined vacuum and pressure process having a suc-

cessive vacuum and pressure condition indicator formed in a wall thereof, said indicator comprising a relatively small concavo-convex area in a rigid wall of the container which is adapted to flex freely from the plane of said wall in either direction in response only to pressure applied to either side thereof and having such inherent characteristics as to cause it to remain in the position to which it is last moved by the application of pressure applied externally thereto.

3. A container for shipping foodstuffs and the like under pressure in a preserving gas having an end closure member with a convexo-concaved pressure indicating area disposed centrally thereof, said convexo-concaved pressure indicating area having such inherent characteristics as to cause it to remain in either a convexed or a concaved position depending upon pressure conditions when acted upon by a manual force, and an annular reinforced area upon said end closure member between the convexo-concaved indicating area thereof and the cylindrical wall of the container for preventing a flexing movement at the seal between the end closure member and the cylindrical wall of the container.

4. A container for preserving foodstuffs packed under pressure in a preserving gas having a normally dome shaped portion formed in a wall thereof, said normally dome shaped portion being movable into an in or an out position and having such inherent characteristics as to cause it to remain in either of said positions unless acted upon by an applied force.

CARL HILMER HANSEN.