Feb. 26, 1935. J. E. TONE ET AL 1,992,557

APPARATUS FOR TREATING FILLED CONTAINERS

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Fig. 1.

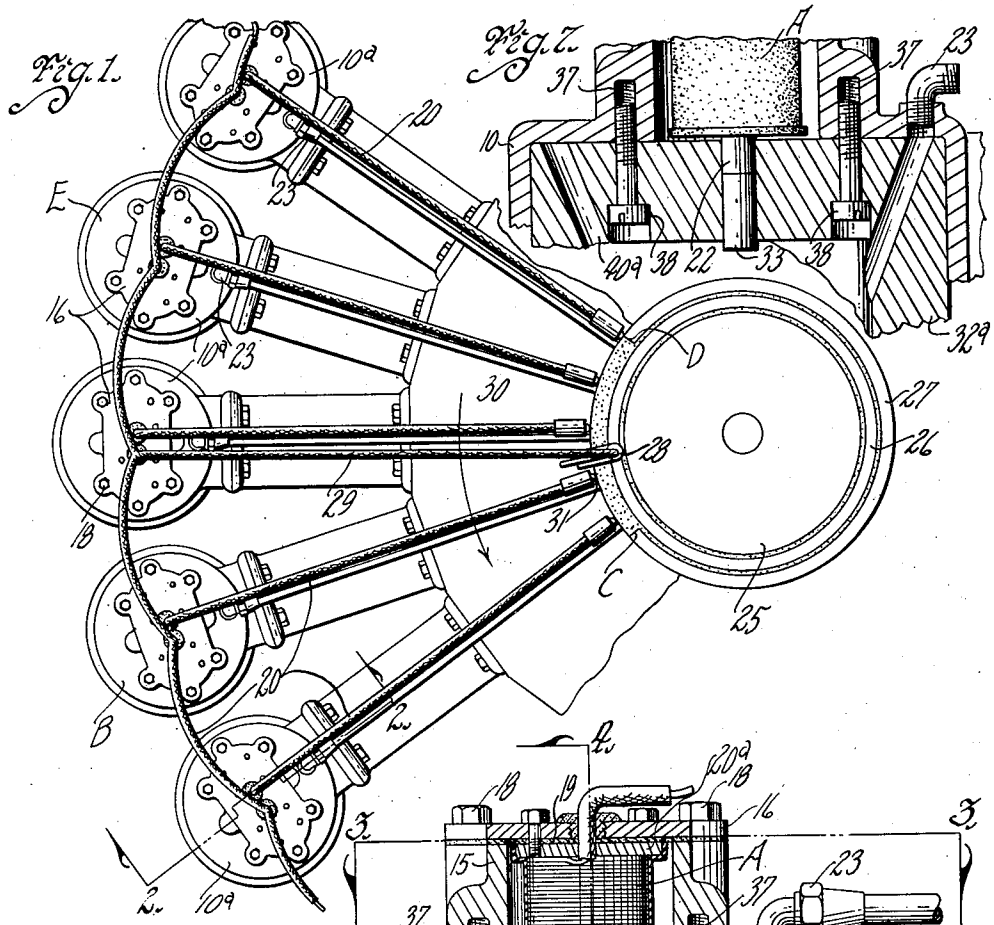


Fig. 2.

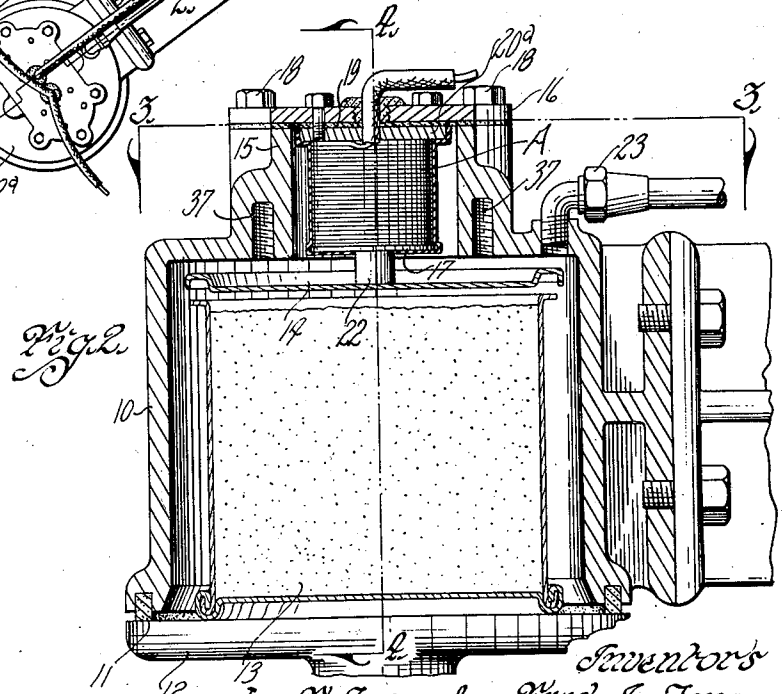


Fig. 3.

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Fig. 3

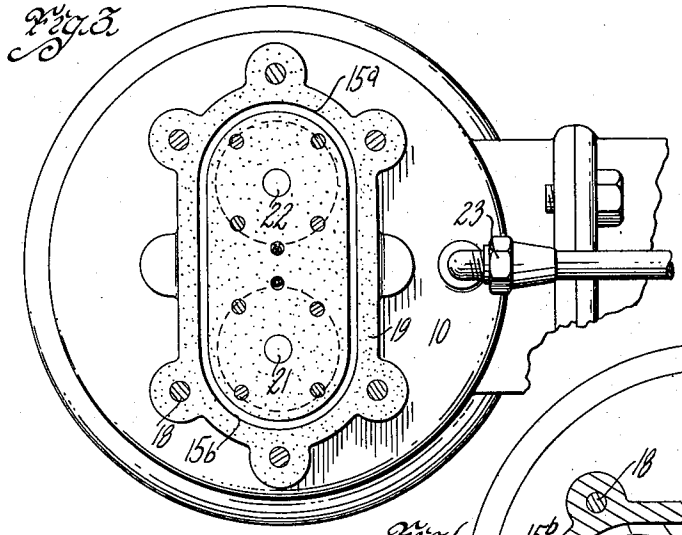


Fig. 6

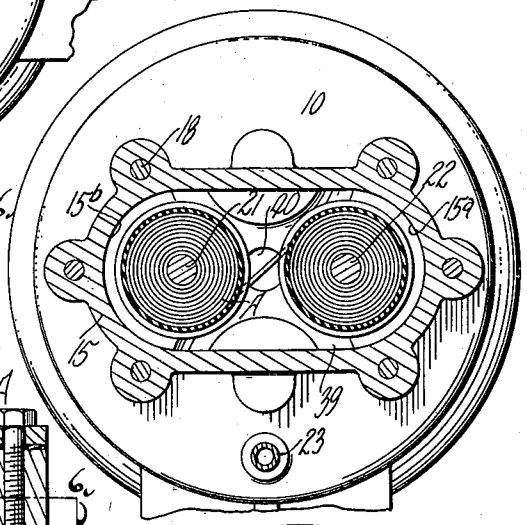


Fig. 4

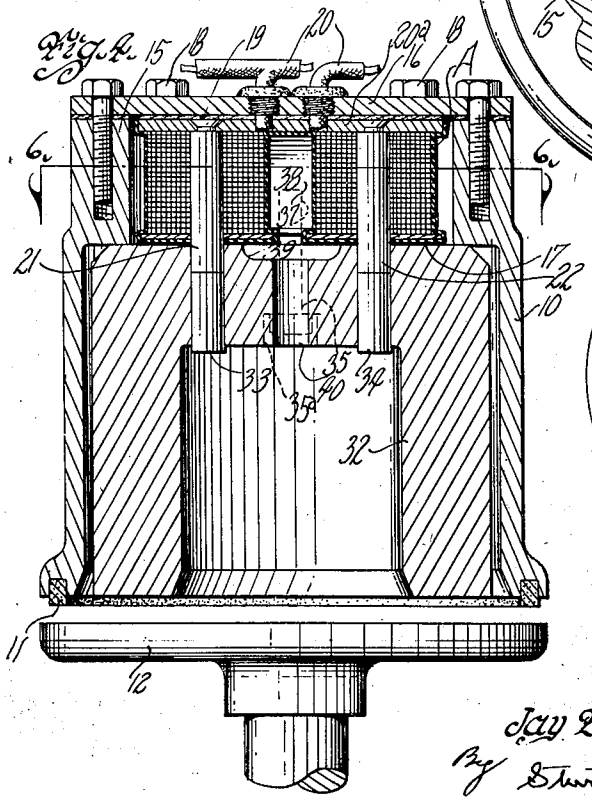
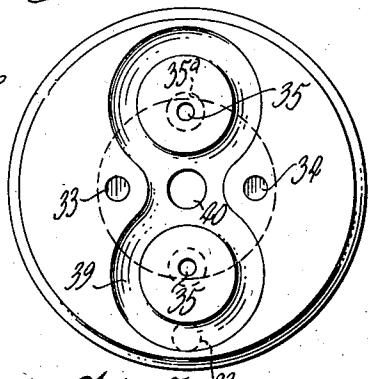


Fig. 5



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APPARATUS FOR TREATING FILLED CONTAINERS

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Application November 11, 1931, Serial No. 574,452

5 Claims. (Cl. 226—82)

The invention relates to new and useful improvements in an apparatus for treating filled containers, and more particularly to an apparatus which is designed for vacuumizing and/or gassing containers for food products.

It has been a common expedient to place a container for food products in a chamber and to draw a vacuum on the chamber and the container and then seal the container. It has also been a common practice to charge the container with an inert gas before sealing. In a double-seamed closed container, the end is provided with a sealing material and considerable difficulty has been experienced in the drawing of a vacuum on the container when the cover is applied loosely thereto, and even greater difficulty in charging the container with inert gas under pressure, the gas bearing on the cover, particularly when a vacuum has been created within the container, forces the cover into sealed contact with the flange on the body of the container and thus prevents the gas from passing into the container.

An object of the present invention is to provide an apparatus for treating containers wherein the cover is suspended above and away from the container body during the treatment thereof.

A further object of the invention is to provide an apparatus of the above type wherein the cover may be lifted from the container body after the container is positioned within the chamber where it is to be treated.

A still further object of the invention is to provide an apparatus of the above type wherein the suspended cover may be released prior to the opening of the chamber to the atmosphere so as to cover the container and though loosely applied, prevent to a large degree, air from entering the container.

A still further object of the invention is to provide an apparatus wherein the container is placed in a bell of slightly larger dimensions than the container and conforming in shape thereto so as to reduce to a minimum the size of the chamber on which the vacuum is drawn and subsequently charged with an inert gas.

A still further object of the invention is to provide an apparatus of the above type with means for varying the size of the chamber for different sizes of containers without interfering with the cover suspending means.

In the drawings which show by way of illustration one embodiment of the invention—

Figure 1 is a top plan view showing more or less diagrammatically a portion of an apparatus embodying the invention;

Fig. 2 is a vertical sectional view through one of the chambers and showing the means for suspending the cover during treatment;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 2, but showing the means for varying the size of the chamber for different sizes of containers;

Fig. 5 is a top plan view of one of the fillers used for decreasing the size of the chamber;

Fig. 6 is a horizontal sectional view on the line 6—6 of Fig. 4, and

Fig. 7 is a vertical sectional view centrally through the upper portion of the chamber and showing a modified form of filler.

The invention has to do with an apparatus for the treating of food products in containers in which they are to be marketed. Broadly, the invention comprises a chamber in which the filled container is placed with the cover loosely applied thereto. Means is provided within the chamber for lifting the cover from the container body to facilitate the treatment of the container. The means which suspends the cover is controlled from outside the chamber so that the cover may be lifted after the cover is placed in the chamber and the chamber closed, if desired. Likewise, the cover suspending means may be operated to release the cover so that it will drop on to the container before the chamber is opened.

In the present illustrated embodiment of the invention, the chamber in which the container is treated is in the form of a bell, and the chamber is slightly larger than the container, but of the same proportions. In order that different size containers may be treated in a given size bell, and the dimensions of the chamber relative to the container remain in substantially the same proportions, a filler has been provided which may be attached to the inside of the bell for reducing the size of the chamber within the bell. In the present illustrated embodiment of the invention, the means for lifting the cover is in the form of an electro-magnet located at the upper end of the bell. Means is provided so that when a filler is placed in the chamber, a chamber may be produced thereby of slightly greater height than the container which is to be treated therein, and this may be accomplished without interfering with the magnetic lifting means for the cover. This is accomplished by providing extension pieces for the cores of the magnets which are applied when the filler is placed in the bell.

The apparatus illustrated will now be described in detail. In the drawings we have shown a chamber preferably cylindrical in form indicated generally by the reference numeral 10. The particular form of the chamber here used for purposes of illustration is closed at its upper end and open at its lower end. In the lower end of the chamber 10 is a suitable gasket 11 preferably made of soft rubber, so that a tight seal may be had between the chamber proper and the closure member 12, which may be of any suitable form. For example, the closure member 12 may constitute a table mounted to be raised and lowered by mechanism not here shown, for raising and lowering the container 13. The container 13 may be used for coffee or other products and may be of any size adapted to the particular apparatus used.

Where our cover lifter is employed, the cover 14 is placed loosely on the container 13 before the latter is moved into the chamber 10. The cover 14 must be of a ferrous nature, that is to say, it must be capable of being attracted by a magnet.

In the form of the chamber illustrated in our drawings, we have shown at the top of the chamber the upwardly extending head 15 having the spaced recesses 15*a* and 15*b* suitable to receive the electro-magnet. The electro-magnet is suspended from a cover plate 16 in such manner that the magnet may be dropped into the recesses mentioned.

The magnet assembly consists of two cores 21 and 22 with their respective windings and the plate 16 and the connections with the leads 20 which leads extend through the plate.

The plate 16 fits over the head 15 and is secured thereto as by cap screws 18.

A gasket 19 is interposed between the plate and the upper part of the container.

The magnet indicated generally at A may be sealed in place by means of the wax 17 if that is desired.

Preferably the cores are connected by a bar 20*a*, and the magnet sections may be connected with the plate 16 in any suitable way.

We will first explain briefly the use of our cover lifter with the simplest form of mechanism and then explain its use in a more elaborate machine and then refer to the construction and use of the fillers.

Considering now our cover lifter as employed with an ordinary simple container, it will be observed that the container is put into the chamber and the chamber closed and sealed by means of the closure member 12. The electrical circuit through the magnet is then closed, whereupon the magnet will become energized and lift the container cover 14 and hold it slightly spaced above the container.

The top of the chamber 10 is provided with a passage 23 which may be connected with a suitable source of vacuum and/or gas under pressure.

The interior of the chamber 10 is then subjected to vacuum and/or pressure according to the product to be treated or the particular apparatus being used.

When the vacuum or pressure treatment has been completed, the current through the magnet is broken and the cover 14 is dropped upon the container 13. The cover may be clamped and fastened or sealed, either within the chamber in which the treatment has been carried on, or outside the chamber, as contemplated with the apparatus in our co-pending application Serial No. 574,453, filed of even date herewith.

After the cover has been released and dropped upon the container, the container may be removed from the chamber 10.

Where our improved cover lifter is used with an apparatus of the kind shown in our co-pending application proper means must be used for connecting the magnets with the source of electrical energy and for making and breaking the connections at proper times.

In Figure 1 we have shown in a diagrammatic form the central support 25. This is in a machine of the type having a plurality of chambers 10*a* arranged in a circle and spaced radially outwardly from the central support. These chambers are adapted to travel around the central support.

During the travel of the chambers around the central support, the containers are brought into the chambers and the chambers closed. The cover lifter magnet is energized. The chamber and the material in the container therein are subjected to vacuum and/or pressure and then the magnet is de-energized to drop the cover and the container is removed from the chamber and the cover then tightly crimped on.

In an apparatus of this kind where the chambers move around a common center we preferably provide the fixed commutator ring 26 on the central support and the interrupted commutator ring 27 concentrict therewith.

The moving mechanism has the brush 28 co-acting with the ring 26. The brush 28 is connected by suitable wiring 29 with one lead 20 of each magnet. The other lead 20 of each magnet is connected by suitable wiring 30 with a separate brush 31 also connected with the rotating mechanism and co-acting with the interrupted ring 27.

It may be explained that when one chamber 10*a* is at the position marked B in Figure 1, the chamber is closed and ready for vacuum and/or pressure application.

At that time, the brush 31 of the afore-mentioned chamber is on an insulated portion of the circular commutator ring 27. As the chamber proceeds in its travel, the brush 31 of each magnet engages the ring 27, the circuit is completed through the magnet, and the cover of the container in that chamber is raised. Immediately thereafter the vacuum and/or pressure treatment starts, the point in the travel where this occurs, being indicated at C.

The particular chamber travels around the apparatus until it reaches the point indicated at D where the vacuum and/or pressure treatment ceases. Immediately thereafter, the brush 31 of the magnet of the chamber under consideration leaves the energizing portion of the ring 27, the magnet is deenergized and the container cover is dropped upon the container. When it is desired to energize and de-energize the magnets for raising and dropping the container covers for a series of pressure and vacuum treatments, as above mentioned, all that is necessary is to vary the construction of the commutator to provide for closing and opening the circuits at the proper times.

The chamber then moves to unloading position noted at E in Figure 1, where the container is taken out of the chamber and the cover crimped on.

In Figure 4, we have shown a chamber equipped

with our cover lifting device and also having our improved filler for cooperating therewith.

It will be understood that machines of the kind with which our cover lifters are used are likely to be large and expensive.

We contemplate the use of our cover lifter with machines having a considerable number of container chambers.

It is not an easy matter to change these chambers and to substitute others of different sizes. On the other hand, it is desirable to use the machine for handling containers of different sizes.

It will be obvious that such machines are ordinarily set up for affording a certain amount of vacuum or pressure in the chambers and that if after handling containers of one size, it is then desired to handle containers of a considerably different size, the volume to be vacuumized or subjected to pressure will vary. The smaller the volume the higher the possible vacuum and the less gas consumed. Obviously, it is more efficient to vacuumize and gas the smallest volume possible.

It is also true that if the second type of container to be used is shorter than the first one, then the cover on the container will be spaced considerably below the magnet when the container is moved into the chamber.

For taking care of these problems, we have provided fillers, one of which is indicated at 32. As here shown, this filler is in the form of a downwardly opening cup-shaped member having a wall thick enough to take up whatever proportion of the space inside the chamber the user may desire.

The filler is made preferably of non-ferrous material and leaves a central open space in the chamber for receiving the smaller container.

In the upper part of each filler are pole pieces 33 and 34 which are arranged to register and contact with the cores 21 and 22.

It is desirable to provide simple means for anchoring the filler in the container 10, and it is necessary that when this is done, the extensions 33 and 34 should always register with the cores 21 and 22. For accomplishing this purpose, we provide two spaced holes indicated at 35 on the upper part of the filler, on the same radius and diametrically opposite each other. These holes 35 are arranged 90° around the circle from the extension pole pieces 33 and 34. In the head of the chamber 10 are suitable drilled and tapped holes 37 to receive cap screws 38 extending upwardly through the holes 35. The heads of the cap screws 38 are countersunk in the filler 32 as shown.

The upper surface of the filler is provided with a recess 39 in the form of a figure 8 as illustrated in Figure 5. This recess 39 is of such length it will always communicate with the passage 23 and the central part of the recess will always communicate with the vertical passage 40 through the top of the filler 32, so as to afford free passage of gases through the filler.

On account of the structure as just explained, it will be obvious that the filler can be anchored in place in either of the two positions 180° apart, and in either case, the extension pole pieces 33 and 34 will always register with and engage the cores of the magnet and in either case the recess 39 will be a means for affording communication between the passages 23 and 40.

In Figure 7 we have shown a different, and in some instances, preferred form of the filler, indicated as 32*a*. The filler 32*a* is of the same general shape as the filler 32 and anchored in place in the same manner, but instead of the recess 39 and passage 40 of the filler 32, the filler 32*a* has diametrically opposite inclined passages 40*a*. This structure makes it possible, where desirable, to move the magnet pole pieces closer together for smaller diameter cans.

By the use of the apparatus described, the containers may be placed under vacuum quickly and without drawing the food product out of the container. It is well-known that when a cover is clinched to a container and the container subjected to a vacuum treatment, that the air is drawn through restricted passages between the cover and the container, and when there is a light, dry, powdered food product in the container, some portions thereof will be drawn from the container and will accumulate in the channel between the cover and the flange of the container body so as to interfere with the proper sealing during double-seaming. When, however, the cover is raised from the container body during the vacuumizing of the container, there is a free passage for the air to come out of the food product and out of the container which is unrestricted, and therefore, the food product is not lifted from the container. It is also well-known that the channel of the cover is provided with a sealing material, and when this cover rests even lightly on the flange of the container body, gas under pressure replacing the vacuum in the chamber and the container is liable to force the cover into sealed engagement with the flange and prevent proper charging of the container with the inert gas. When the cover is suspended above the container as described in the present apparatus, the inert gas will not dislodge it from the supporting magnets and is free to pass into the container so that during treatment substantially all of the air is excluded from the container and replaced by the inert gas.

By forming the chamber so that it is of slightly larger dimensions than the container, the vacuum may be drawn very quickly and replaced with the inert gas and the cycle repeated without utilizing only a relatively small amount of CO_2 gas. Furthermore, the chamber may be opened to the atmosphere for the removing of the container and another container placed thereon, and a vacuum drawn on the chamber very quickly. By the use of fillers of different sizes, the machine is adapted for use with containers of varying sizes without interfering with the efficiency of the vacuum or gas treatment or the effective operation of the means for lifting and suspending the cover. It will be noted that the cores of the magnets project into the chamber and will prevent the cover from closing the vacuum pressure passages in the head. While the cover lifting means is shown as applied to a machine of the bell type, operating in succession on a single container, it will be obvious that the cover lifting and suspending means may be used with any type of machine for creating a vacuum, and/or supplying the container with a gas. It is also obvious that changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what we claim as new and desire to secure by Letters-Patent, is—

1. In an apparatus for treating filled containers, the combination of a chamber for enclosing the container with the cover loosely applied

thereto, and electrically controlled means within the chamber and controlled from the exterior thereof for lifting the cover from the container body and for releasing and dropping the cover on to the container body after a predetermined interval.

2. An apparatus for treating filled containers comprising a bell forming a chamber, a container support for placing the container within the bell and for closing the bell, and electrically controlled means located within the upper end of the bell including a magnetizable core disposed above the cover for lifting the cover from the container when said core is energized and for releasing the cover so that it will drop on to the container after a predetermined time interval.

3. In an apparatus for treating filled containers, the combination of a bell, a container support associated therewith for placing a container in said bell and for closing the bell, means whereby the chamber within the bell may be subjected to a vacuum and subsequently charged with a gas, said chamber within the bell being of slightly larger dimensions and conforming to the container to be treated, means within the chamber for lifting the cover from the container for treatment and for releasing the cover so that it will drop on to the container, and a filler for said chamber adapted to be secured within said bell and having a chamber therein whereby containers of a smaller size may be treated and the relative proportions of the container to the chamber maintained.

4. In an apparatus for treating filled containers, the combination of a bell, a container support associated therewith for placing a container in said bell and for closing the bell, means whereby the chamber within the bell may be subjected to a vacuum and subsequently charged with a gas, said chamber within the bell being of slightly larger dimensions and conforming to the container to be treated, means within the chamber for lifting the cover from the container for treatment and for releasing the cover so that it will drop on to the container, a filler for said chamber adapted to be secured within said bell and having a chamber therein whereby containers of a smaller size may be treated and the relative proportions of the container to the chamber maintained, and means whereby said cover lifting means may be caused to operate upon the covers of the different sized containers.

5. In an apparatus for treating filled containers, the combination of a chamber for enclosing a container with the cover loosely applied thereto, means for varying the size of the chamber for containers of different sizes so as to maintain substantially the same proportions between the container and the chamber in which it is treated, and means located within said chamber and operating to lift the cover from the container, said cover lifting means being adapted to operate on covers for containers of different sizes.

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