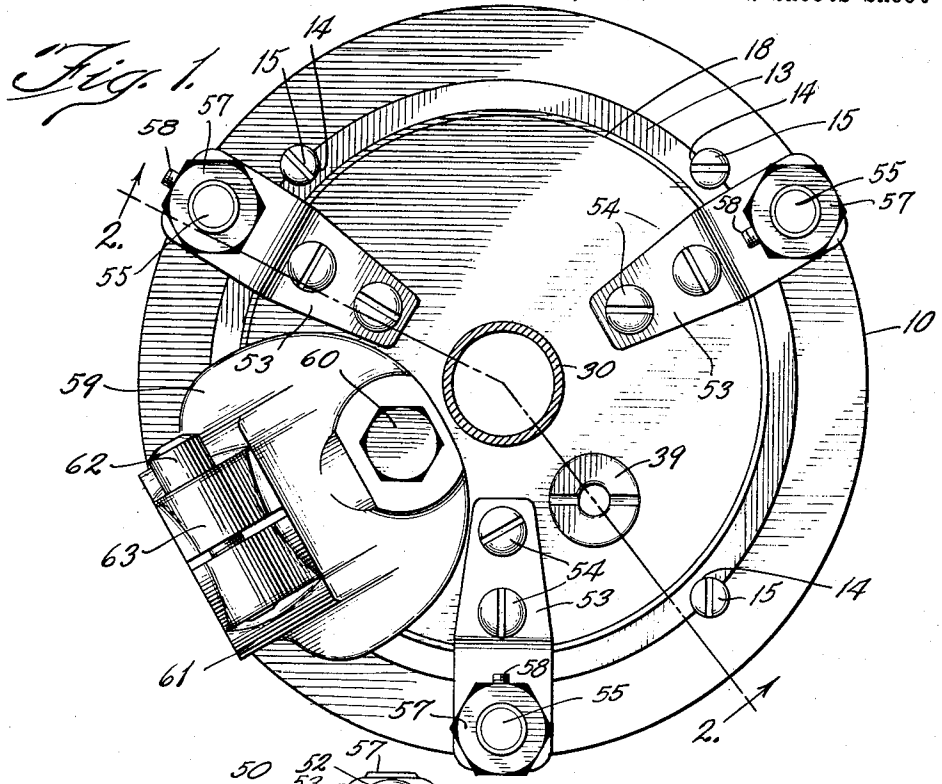
June 19, 1934. W. M. HICKS 1,963,132

CANNING APPARATUS

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Fig. 1.



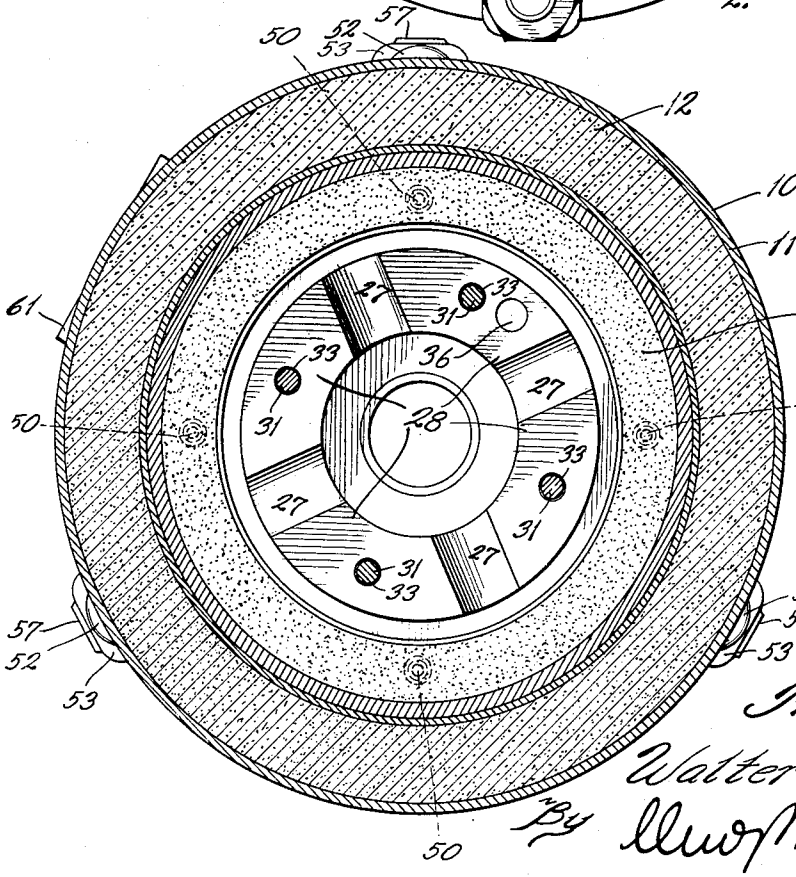


Fig. 4.

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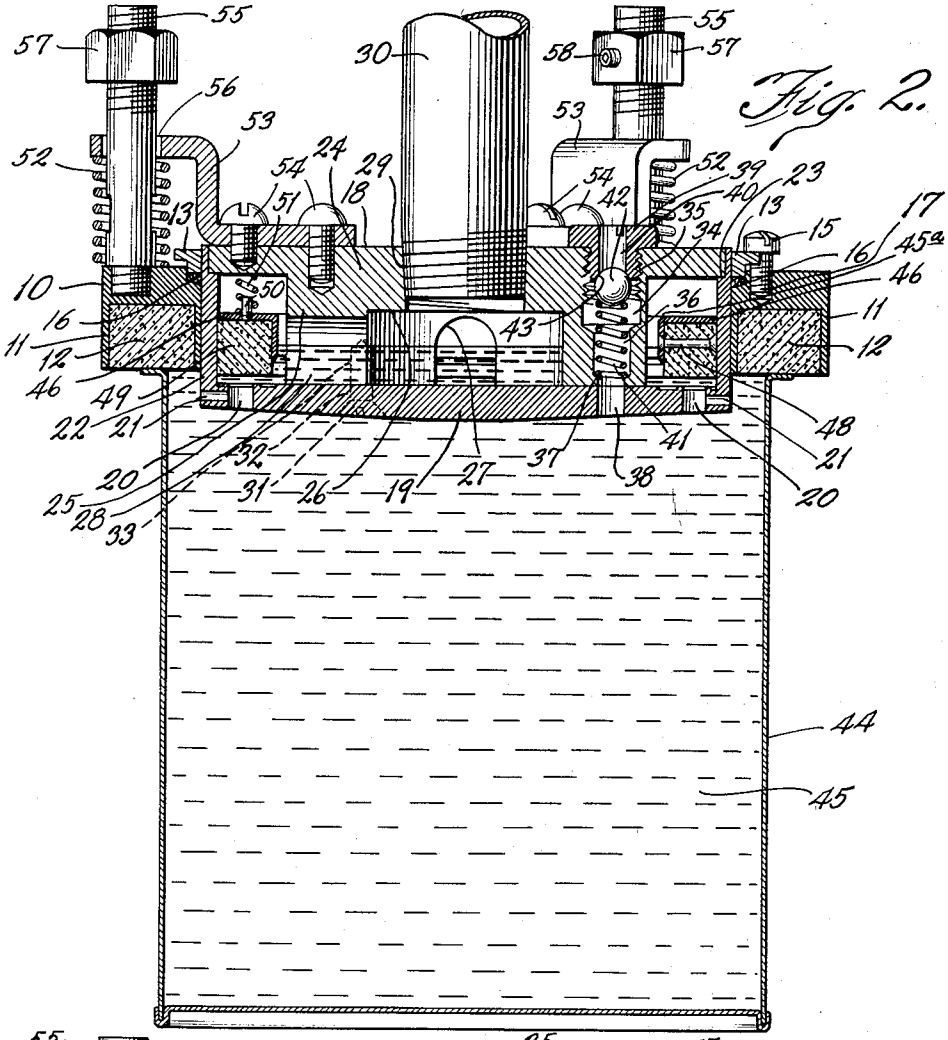


Fig. 2.

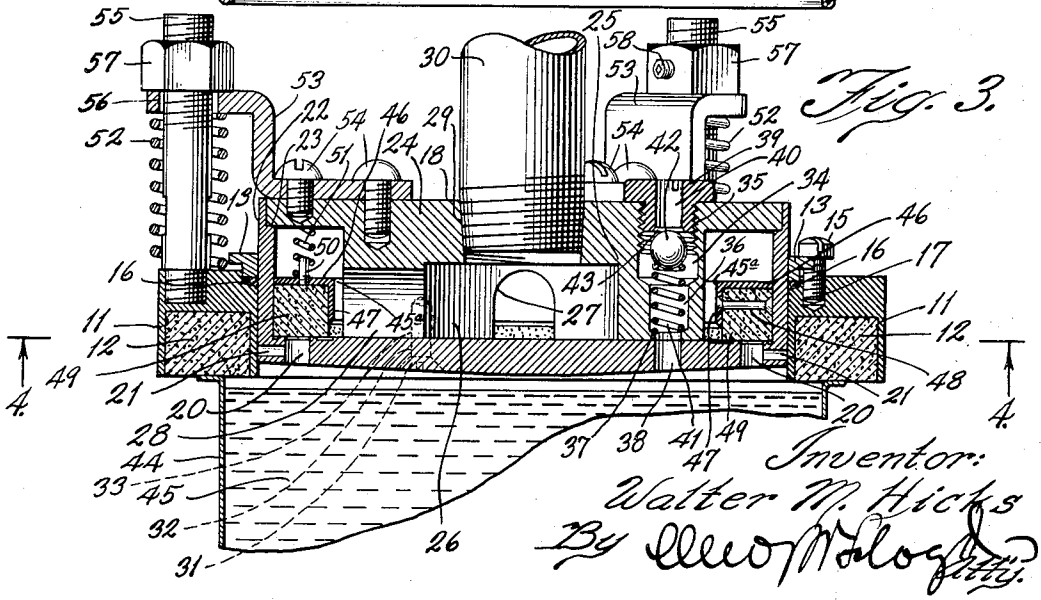


Fig. 3.

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Patented June 19, 1934

1,963,132

UNITED STATES PATENT OFFICE

1,963,132

CANNING APPARATUS

Walter M. Hicks, Fennville, Mich., assignor to Michigan Fruit Canners, Inc., Fennville, Mich., a corporation of Michigan

Application November 29, 1933, Serial No. 700,166

4 Claims. (Cl. 226—22)

This invention has to do with a device for leveling or compacting solid matter in a preserving can while concurrently removing and recovering the syrup, brine, juice or extract used in conjunction with such solid material.

Cans are filled first with the fruits or vegetables or other material to be sold therein. The height of the can fill depends upon the character of the vegetable or fruit, the contents of the can sometimes extending well above the rim of the can. Syrup, or brine, or meat juice, or other liquid material is added to the cans containing solids generally in uniform measured quantities.

Thereafter the can with its solid and liquid content is run into and out of an exhaust box where there is a heat treatment. Air pockets in the can between solid and liquid material are generally broken in the exhaust box. Next the cans, still open, are run under a leveling plunger or the like so that their solid contents are reduced to a level below the rim of the can. This facilitates fitting the can cover. As the solid material in any can varies from that in each of the other cans in the pack while the liquid content is generally fairly uniform (but not always so) the leveler or leveling plunger under conventional operation generally splashes or forces out of the can varying quantities of juice, syrup, extract or other liquid, which material heretofore has been wasted. As some of these materials are expensive, losses in this manner have been troublesome and annoying.

It is an object of the present invention to provide an improved form of leveling device for pressing material into a can while recovering any excess of liquid that may be displaced from the can.

Another object of the present invention is the provision of a new type of leveling device adapted to temporarily seal an open can while compressing and settling the solid contents therein and thus prevent the spilling of the liquid content.

Still another object of the present invention is the provision of a device of the kind mentioned wherein the device is readily released from its contact with the can at the time of the separation of the can and plunger.

These objects, and such other objects as may hereinafter appear, are obtained by the novel construction, unique arrangement and improved combination of elements comprising the embodiment of the invention illustrated in the accompanying two sheets of drawings, hereby made a part of the application, and in which:

Figure 1 is a plan view of one embodiment of the invention;

Figure 2 is a sectional view of the device shown in Figure 1, taken at the line 2—2 of said Figure 1 and showing the manner in which the device is registered upon a can;

Figure 3 is a view similar to the view in Figure 2 but with the device in a different stage of operation; and

Figure 4 is a cross sectional view of the device taken at the line 4—4 of Figure 3, looking in the direction of the arrows.

Like reference characters are used to designate similar parts in the drawings and throughout the description of the invention that follows.

Reference should be had to Figures 1, 2 and 3. The device comprises an outer annular member 10 having a channel section 11 in which is seated a resilient sealing ring 12, which may be of rubber. Concentric with the inner periphery of the annular member 10 is an annular flanged ring 13 having any desired number of notches 14 thereabout for receiving the shanks of machine screws 15. Between the members 10 and 13 is packing material 16. The machine screws 15 are threaded into recesses 17 within the top of ring 10 to draw the members 10 and 13 together to compress the packing material 16 whereby the latter may be displaced inwardly of the device any desired distance within limits.

Reciprocally disposed within the annular members 10 and 13 is a head 18. The lower face of the head 18 is formed of a flanged plate 19. A plurality of vertical apertures 20 is arranged about the plate 19. Radial apertures 21 are in communication with a selected number of apertures 20, the apertures 21 opening upon the lateral edge of the plate 19. A flange extending upwardly about the edge of the plate 19 is designated 22. A shoulder 23 is arranged about the upper edge of the flange 22.

The upper body of the compression or leveling head 18 comprises a circular plate-like member 24 which is seated on the shoulder 23 upon the flange 22 of the plate 19. Depending downwardly from the plate 24 is a circular body 25 having a recessed section 26 centered therein. Channel sections 27 leading radially of the body 25 from the recess 26 divide the body 25 into quadrants 28 (see Figure 4). If desired, the number of channels and correspondingly the number of sector sections 28 may be varied. Within the ceiling of the recess 26 is a threaded aperture 29 for connecting a discharge conduit 30. Set screws 31 passing through countersunk apertures 32 in the

lower plate 19 may be extended into threaded recesses 33 in each of the quadrant sectors 26 to draw the plate 19 firmly against the under side of such sectors.

Through the upper plate 24 and the downwardly projecting body 25 is an opening 34 provided with a threaded section 35 at its upper end. A section 36 of less diameter than section 35 having a shoulder 37 at its lower end forms a continuation of opening 34 registering with an opening 38 in the plate 19. A flanged cap 39 having a passageway 40 therein is screwed into the upper end of the opening 34. Seated upon the shoulder 37 is a weak compression spring 41 for supporting a ball valve member 42 and for normally holding the latter in impinging engagement with a seat 43 therefor at the lower end of the passageway within the cap 39. When the ball 42 is moved from its position against the seat 43, as it is during one stage of operation of the device, air may pass inwardly of the device through the passageway 40, the opening 34 and the aperture 38 into a can 44 therebeneath and whose contents 45 are being pressed and leveled by the device.

Encircling the body 25 of the upper plate 24 of the compression head is a circular angle piece 45*a* having flanges 46 and 47. Secured to the flanges 46 and 47 by means of an adhesive, by rivets 48 distributed thereabout at selected intervals, or by other suitable means, is an annular piece of resilient material 49, which may be similar to the material 12. A plurality of lugs 50 project upwardly from the flange 46 to serve as an anchorage about which compression springs 51 may be disposed. The upper end of each of the springs 51 presses against the plate member 24 whereas the lower end of such springs presses against the flange 46 to urge the member 45*a* downwardly to move the sealing material 49 over the apertures 20.

Normally the compression head 18 of the device will be supported in an upward position with respect to the rings 10 and 13 by means of coiled springs 52 and an equal number of brackets 53 resting thereon and attached to the compression head 18 by means of set screws 54. Stub bolts 55 anchored in the upper face of the annular member 10 provide means for retaining the springs 52 in place. Apertures 56 within the end of the support arms 53 adapt such arms for movement axially of the bolts 55 while in pressing engagement with the springs 52. The upper limit of movement of the arms 53 and hence of the head 18 may be regulated by changing the position of the nuts 57 longitudinally of the bolts. When the proper position of the nuts 57 has been determined, the small set screws 58 in the sides thereof may be turned into locking engagement with the bolts.

Means for pressing the compression head 18 downwardly against the yielding urge of the springs 52 may be operatively connected to the device through bracket 59, which is attached to the head 18 by bolt 60 (see Figure 1). To facilitate a coupling between the bracket 59 and a reciprocable operating means (not shown), such bracket may be provided with a split collar 61 integral therewith. A machine screw 62 may be threaded conventionally in ears 63 upon each part of the split collar 61 for drawing such parts together about such reciprocable operating means.

When first loaded into a can, the solid portions of the contents 45 of can 44 will usually be heaped slightly above the rim of the can. A portion of liquid, generally measured, is placed in the can after it is loaded with solid material. The cans thus filled may be placed in an exhaust box for treatment as has been hereinabove explained. While the cans are still within the exhaust box or shortly thereafter, the present device is registered with each individual can. As the device is lowered to an open can by the means attached to the bracket 59 for reciprocating the device upwardly and downwardly, the head 18 will be at the upper of its reciprocable limits with the arms 53 engaging the nuts 57. The device is of such a diameter that the sealing member 12 will coincide with the brim of the can in the manner illustrated in Figures 2 and 3. After the sealing member 12 has engaged the brim of the can to prevent the escape of the contents therefrom, continued downward movement of the bracket 59 causes the head 18 to press the plate 19 against the heaped contents within the can and to compact them to dispense with any remaining air pockets that may be therein or thereabout.

The pressure of the plunger upon the can contents will also serve to compress certain materials. While the pressure is thus applied to the contents of the can any excess of liquid present is forced upwardly through the apertures 20 to unseat the sealing member comprising the annular piece 49 and to pass into the chamber formed by the recess 26 by way of the channels 27. No portion of the liquid can escape over the brim of the can because of the seal effected by the member 12; nor can any liquid pass upwardly between the head 18 and the annular members 10 and 13 because of the packing piece 16, which is compressed as desired against the flange 22 of the head by manipulating screws 15. The small apertures 21 about the side of the plunger 18 permit the escape of air that may accumulate between the plunger as it is moved to its downward position and the side walls of the can 44, thus preventing that space from being filled with air and permitting of an even distribution of the contents of the can so that there will be a uniform filling thereof.

The displacement of the device into the body of the contents is governed so that the desired compactness of materials will be had.

Removal of the device from the can 44 occurs incident to the reversal of the reciprocal movement of the bracket 59. As soon as the displacement of the liquid upwardly through the apertures 20 ceases, the springs 51 cause a reseating of the sealing material 49 over the apertures 20 so that the liquid then contained within the device cannot pass backwardly into the can. During the first part of the upward movement of the bracket 59, only the head 18 is allowed to rise under the influence of the springs 52 while the sealing member 12 remains upon the brim of the can.

Means for providing air between the surface of the liquid contents and the lower face of the plate 19 at the time the device is lifted from the can is had in the air valve including the ball 42. With the slightest decrement of pressure with respect to atmospheric pressure, at the surface of the liquid beneath the plate, the correspondingly reduced pressure within the lower part of the passageway 34 will permit the ball 42 to displace the spring 41 downwardly and air to pass inwardly of the can by way of the passageway 34. By breaking the vacuum between the device and the contents of the can all like-

lihood of the can being lifted with the device is precluded. By making the lower face of plate 19 converge slightly downwardly toward its center the vacuum between the plate and the liquid is more easily broken for the outer edge of such face is then separated from the contents slightly before the center portion.

Subsequently to the device being lifted clear of the can, such can may be replaced by another that is to be similarly treated. Each time that a can is treated and excess juice is forced upwardly into the recess or chamber 26, the juice already within the chamber will be further displaced to pass upwardly through the discharge pipe 30 and outwardly of the device. The juice discharged from the conduit 30 may be caught within a suitable vessel and there held until collected in such quantity as is convenient to be transferred for independent treatment.

After the cans have been leveled by the present device they are in condition to be closed. If preferred the apparatus may be made a part of a can closing device rather than attached to and made a part of the exhaust box. If desired the apparatus may be operated independently of either the exhaust box or the can closing machine.

What is claimed as new and is desired to be secured by Letters Patent of the United States is:

1. A device for compressing the contents of a can and comprising a reciprocating member having a reservoir section, discharge conduit, and an apertured face forming the bottom of said reservoir section, means for moving said member toward and from such can, an annular element resiliently mounted on said reciprocating element and moving therewith until engaging the rim of such can to seal it, further movement of said reciprocating element compressing the contents of such can, the apertures in the face of said reciprocating member permitting the excess portion of liquid to pass from such can therethrough into the reservoir section of said reciprocating member, and valve means preventing the return flow of such liquid into such can, said conduit providing a discharge for excess liquid from said reservoir section.

2. A device for compressing the contents of a can and comprising a plunger having an apertured head, means for moving said plunger into such can, a sealing member resiliently mounted on said plunger for axial movement thereof, said member fitting upon the rim of such can and normally extending about the lower edge of said plunger head, certain of the apertures in said head extending vertically through said head and others extending radially of said head into the vertically extending apertures, movement of the plunger after engagement of the sealing member upon such can causing the plunger to compress the contents of such can and uncover said radially disposed apertures, and valve means providing unidirectional flow of liquid from such can by way of the apertures in said plunger.

3. A device for compressing the contents of a can and comprising a plunger having an apertured head, means for moving said plunger into such can, a sealing member resiliently mounted on said plunger for axial movement thereof, said member fitting upon the rim of such can and normally extending about the lower edge of said plunger head, certain of the apertures in said head extending vertically through said head and others extending radially of said head into the vertically extending apertures, movement of the plunger after engagement of the sealing member upon such can causing the plunger to compress the contents of such can and uncovering said radially disposed apertures, valve means providing unidirectional flow of liquid from such can by way of the apertures in said plunger, and other valve means for admitting air to such can upon reverse movement of said plunger.

4. A device for compressing the contents of a can and comprising a plunger, means for moving said plunger a predetermined distance into such can, an annular member resiliently mounted axially of said plunger for sealing the can as the plunger descends thereinto, engagement of said annular member upon the rim of such can arresting the movement of said sealing member with said plunger, the lower edge of said annular member normally being in substantially the same plane as the face of said plunger, said plunger having a hollow head forming a reservoir, the face of said plunger being apertured and forming the bottom of said reservoir, an annular valve in said head providing for unidirectional flow of excess contents of such can through the apertures in said head into the reservoir therein, there being radial openings from certain of said apertures to the side wall of said plunger, said openings being uncovered incident to movement of said plunger after said annular member has engaged the rim of a can, and air valve means through said plunger to admit air to such can coincidentally with a retractive movement of said plunger.

WALTER M. HICKS.