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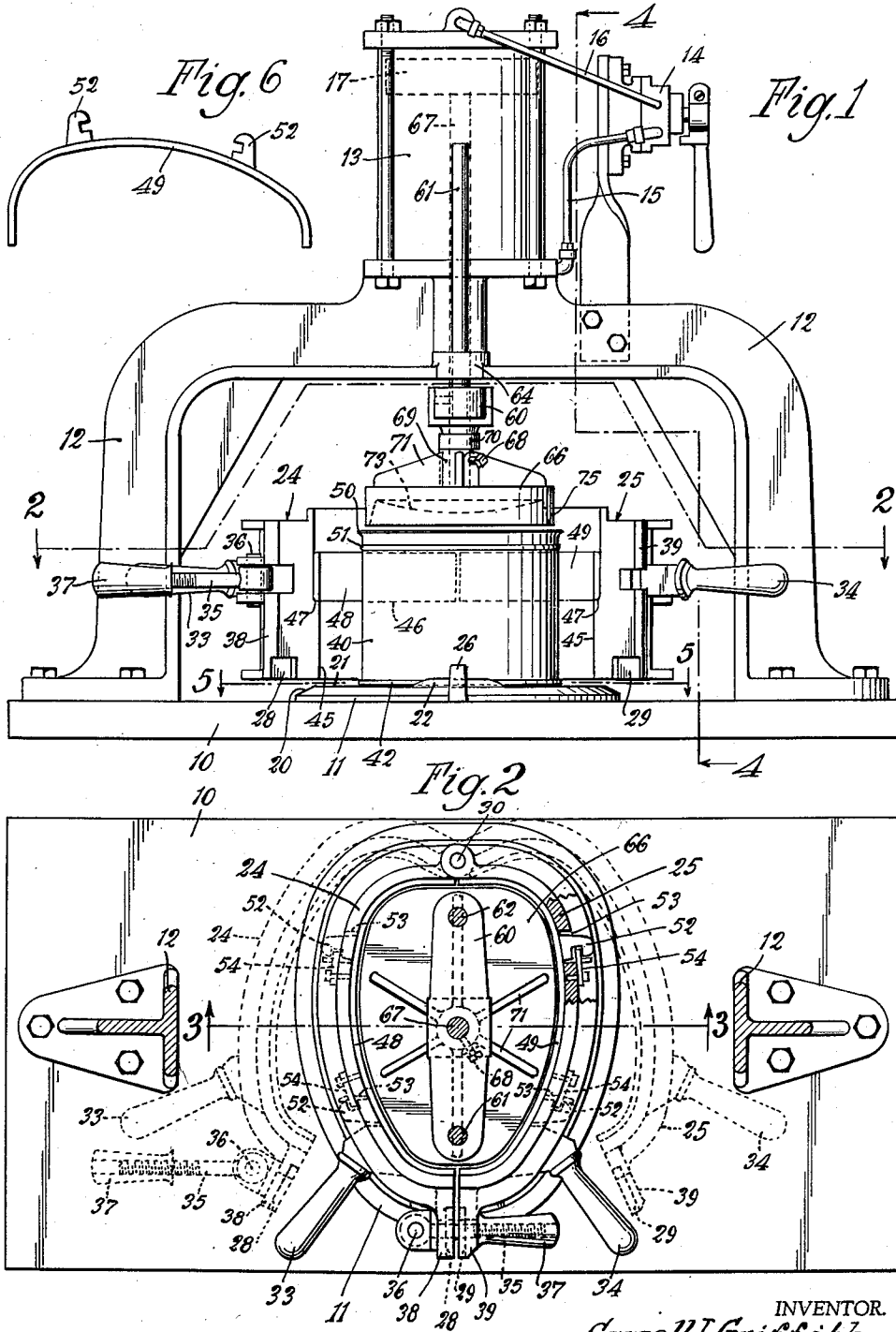
C. L. GRIFFITH

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APPARATUS FOR CANNING MEAT

Filed April 27, 1939

2 Sheets-Sheet 1



INVENTOR.
Carroll L. Griffith
BY *W. Barlett Jones*.
ATTORNEY.

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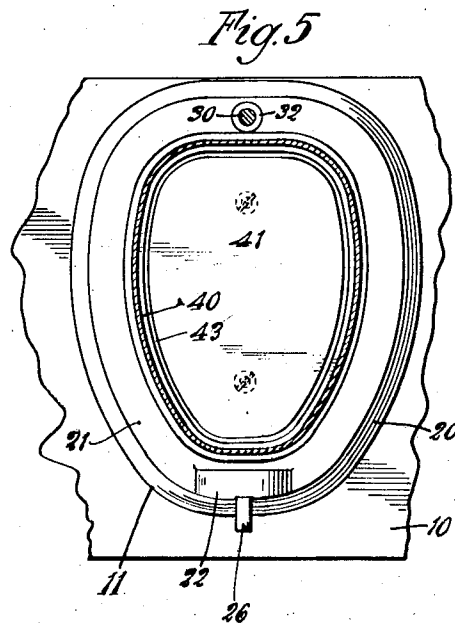
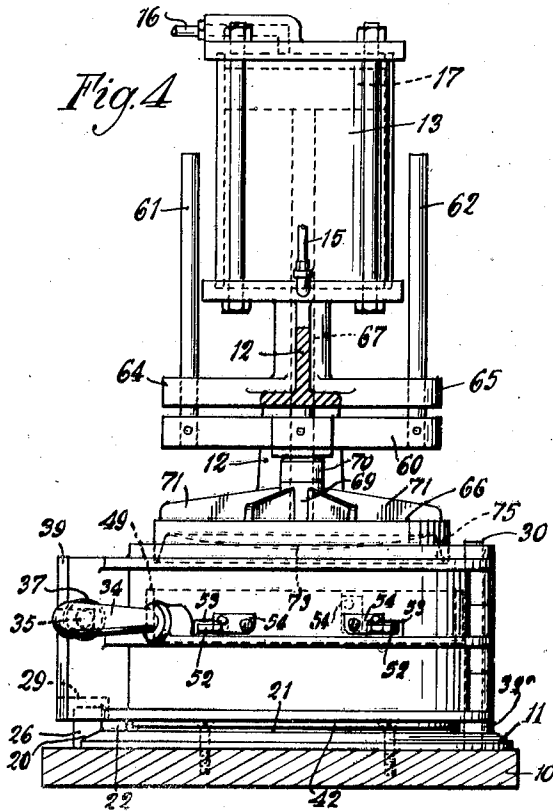
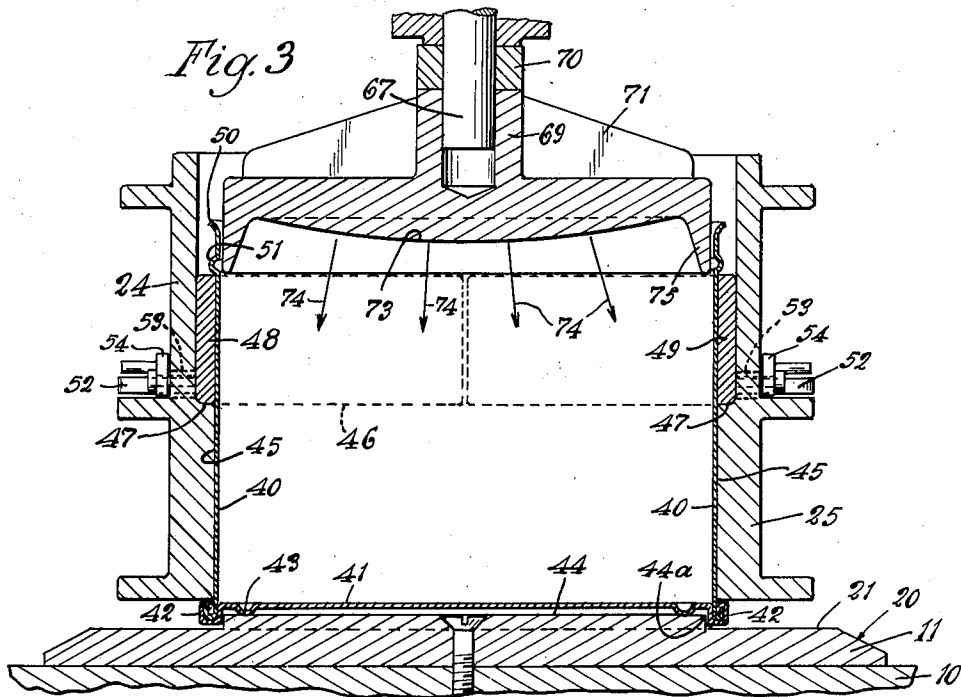
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INVENTOR.
Carroll L. Griffith
 BY *W. Bartlett Jones.*
 ATTORNEY.

UNITED STATES PATENT OFFICE

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APPARATUS FOR CANNING MEAT

Carroll L. Griffith, Chicago, Ill., assignor to The Griffith Laboratories Inc., Chicago, Ill., a corporation of Illinois

Application April 27, 1939, Serial No. 270,336

4 Claims. (Cl. 226—129)

The present invention relates to apparatus for canning meat and like solid material, and particularly boned hams.

The present invention is an improvement upon the apparatus described in the copending Komarik U. S. application, Serial No. 196,244, filed March 16, 1938, now U. S. Patent No. 2,181,945, issued December 5, 1939.

Whole hams are canned far more extensively in the field of this invention than other meats, and present particular problems. Therefore, the invention will be described and explained with reference to hams without necessarily being limited to hams; which because of their shape require non-circular cans.

Prior to the use of the said Komarik apparatus, hams have been canned as follows: The hams are boned, and clamped by pressure into a ham cooker. This is an open top heavy-walled vessel of the shape of the ham and of the can to be employed. It is fitted with a clamp structure which presses the ham into the ham-cooker. A large number of such filled ham cookers are immersed in boiling water for 2 hours. This is called a "precook," and an important result is that the ham shape is set so that it may be readily transferred to the receiving can or "tin" in which it is then placed, and the can evacuated and sealed. The ham thus sealed in its can is cooked again for a period of 20 minutes per pound of ham.

This process has great disadvantages. In the pre-cooking there is loss of weight and shrinkage. About 15% of the juices of the ham go into the cooking water and are lost to the canned ham. In the final cooking a further quantity of juice to about 12% to 13% of the original ham is lost, but stays in the can as liquid or gelatin in the void spaces and over the surface of the ham, making the appearance unattractive when opened.

The apparatus of Komarik aims to overcome these defects of the prior art; in preserving the juices of the ham in the ham; in minimizing shrinkage; in minimizing void space in the can; in eliminating the precooking operation; in eliminating the several handlings of the ham; and in so doing the invention aims to fit a raw ham in its can with a minimum of void space by insertion under mechanical pressure; to seal a raw ham in a can; and to cook it but once.

The Komarik apparatus confines the can laterally by surrounding it with a split collar formed by clamping jaws. Meat placed in the can is pressed in by a pressure-operated plunger.

One feature of the Komarik structure is the provision of adapter plates to raise the effective support for the can bottom in order to accommodate cans of varying standard heights, which are provided for various sizes of ham. Complementary to such plates, the jaws forming the split collar are recessed from the bottom upwardly to accommodate the edge crimp at the can bottom as its position is raised by inserting adapter plates. Thus, when no adapter plate is used, the said recess in the collar provides a region where an area of the can side is not supported against internal pressure of the meat under influence of the plunger.

I have discovered that under certain conditions, depending upon the gauge of metal in the can wall and the pressure, it is possible to bulge out the can-wall at the said unsupported area. This result originally was not obtained in the Komarik device. As first designed and used, a pneumatic plunger was employed. Later a hydraulic plunger was used to produce greater pressures more conveniently. I have found that with standard ham can a pressure of 120 lbs. per sq. inch of plunger area, the can is slightly deformed in the said Komarik apparatus.

The object of the present invention is to provide apparatus suitable for receiving various sizes of cans, yet which will adequately support the whole side wall of the can to prevent bulging from internal pressure transmitted through meat in the can.

A particular object of the invention is to provide adapter means as a changeable part of the can-supporting jaws, so that the can, whether tall or short, rests on the same bottom, and the wall which supports the can-side is of variable height.

Various other and ancillary objects and advantages of the invention will become apparent from the following description and explanation of the invention as set forth in reference to the accompanying drawings in which:

Fig. 1 is a front elevation of the device for compressing the material into the can, showing clamping jaws in open position.

Fig. 2 is a plan view of the device of Fig. 1 on the line 2—2 of Fig. 1, showing the clamping jaws in closed position, and in dotted lines in open position.

Fig. 3 is a detailed enlarged view showing the relation of the can, the base, the clamping jaws and the pressure plunger, taken on the line 3—3 of Fig. 2.

Fig. 4 is a side view of the device of Fig. 1, looking from the right in Fig. 1.

Fig. 5 is a detailed plan view of the base plate of the device, showing a can in cross-section thereon, with the clamping jaws omitted, taken on the line 5-5 of Fig. 1.

Fig. 6 is a plan view of an insert shown apart from the rest of the device.

A large raw piece of meat, such as a ham, is plastic, rather than elastic. As a result of such property it may be deformed to a considerable extent by pressure, and then retain its new form. The present invention is built around this property to obtain the desired results, particularly where non-circular shapes of can are employed. If an attempt is made to insert a ham in a can by hand pressure, the sides bulge out and do not return. The can is thus not in proper shape to receive its lid and be evacuated and sealed in a normal way. It is for this reason that heretofore, the hams have been pre-shaped by pre-cooking as described above.

Accordingly the can is set in a device to retain its normal shape when the material is forced therein. In such a device, considerable pressure must be used to force the ham into the corners and avoid pockets. A flat plate or plunger over the area of the can is inadequate to do this where large areas are encountered, and void space is to be avoided. There may be a squeezing of material up around the edges of the plunger if there is too much clearance, which extruded material interferes with sealing the can. Also the strictly vertical pressure does not carry through the fill out the bottom peripheral corner of the can. The desired effect is obtained with a convex plunger, and where this has an appreciable clearance for practical mechanical convenience, a suitable peripheral flange is provided to keep material out of the clearance space where it would interfere with sealing.

For further understanding of the apparatus it is stated that hams vary in weight and size. Different sizes of cans therefore are provided, and a can is chosen the ultimate volume of which when sealed is substantially the volume of the ham inserted. It is more or less standard practice to employ in one establishment a series of cans having the same area, but varying heights. For example one set of cans varies in height from 6 inches to 3¾ inches with intermediate sizes at ¼ inch intervals. The present apparatus is made for accommodation of an entire set of such cans.

In general, the apparatus comprises a base on which the open-topped can is properly positioned. The ham may be already loosely placed therein. Relatively movable clamping jaws move to a locked position to encompass the side walls of the can, and prevent deformation of the can. Over the open can is mounted a pressure actuated plunger in fixed association with the base to give proper alinement with the properly positioned can. The plunger has a bellied or convex surface to press more on the center than the sides, thus forcing meat down as well as sideways. The ham in the can presents a slight concave surface against which the can top when applied is drawn when the can is evacuated and sealed, thus assuring no void top space. The action of the vacuum on the air and gases dissolved in the cold raw meat also causes it to swell, further assuring close contact of meat and can and cover, with a minimum of void space. Void space remaining is largely due to

high irregularities in the chunk of meat itself.

In Fig. 1, a table 10 carries mounted thereon a base plate 11, and a yoke 12 carrying a pneumatic or hydraulic cylinder 13 and valve control 14 therefor with pressure connections 15 and 16 for raising and lowering a piston 17 therein.

The base 11 is shown best in Fig. 5, and in cross-section in Fig. 3. It has a bevelled edge 20, a raised level or deck 21 running around the base in a location peripheral to the position of the can. A raised lug 22 at the front has bevel edges on two sides continuing from the base level 21, serving as guides and rests for the swinging clamping jaws 24 and 25 when closed. The lug 22 has a post-like projection 26 which serves a stop for the jaws, fitting into appropriate recesses 28 and 29 in the ends of the jaws. The jaws are suitably ribbed for reinforcing them and at the rear are hinged on a post 30 projecting up from the deck 21 of base 11. A boss 32 surrounds the post at the deck 21 to keep the jaws at a proper level when open. Convenient handles 33 and 34 are mounted on the jaws. A suitable clamp is provided having a threaded stem 35 pivoted at 36 on jaw 24, and a handle-like nut 37 thereon. There are opposed bifurcated lugs 38 and 39 at the meeting ends of the jaws, into which the stem 35 swings to be clamped by tightening handle-nut 37.

The interior contour of the jaws is designed for a particular set of cans to hold them in original shape. In order to position the can properly, the base 11 is made to match the bottom of the can. The can shown (Fig. 3) has a vertical side wall 40, a raised bottom 41, an outwardly and downwardly projecting crimp 42, and a reinforcing ring 43 in the bottom near the crimp. The base 11 is raised above its deck 21 to fit into the recess thus formed in the can, and thus position the can. The raised base area is shown at 44, with the peripheral shoulder 44a.

Every can sets in the same way with its bottom 41 on the base area 44. Each jaw presents a contact area 45 against the wall of the can. This area 45 extends from the crimp 42 upwardly as far as the position where the side wall of the shortest can will terminate. This point is represented by the line 46, at which the jaw is cut back providing horizontal ledge 47. Onto this ledge of jaw 24 there is placed one of several inserts 48 which extends the area 45 as high as a certain can taller than the shortest can. Insert 48 has a height according to one size can. Hence several inserts are employed for a set of three or more cans. Because of a long flange on the plunger later to be described, it is possible to use one insert for several sizes of can, and it is essential only that the insert extend at least as high as the bottom position of said plunger. In jaw 25 a corresponding insert 49 is used. The can wall has a flared top 50, and a reinforcing ring 51 below it. The inserts 48 and 49 are made to terminate just below the ring 51 when the corresponding can sets on the base area 44. Thus the whole can-side is confined laterally. The inserts 48 and 49 are secured by hooked lugs 52 carried by the inserts, and extending horizontally through holes 53 in the jaws. Locking hooks 54 engage the lugs, being pivoted to the jaws.

The yoke 12 carries the plunger, heretofore only generally referred to, by any suitable construction. The piston 17 carries below the yoke

12 a cross member 60 (Fig. 4) in which are mounted vertical guide rods 61 and 62 passing through guide bearings 64 and 65 in case wings on yoke 12. A plunger plate 66 is removable mounted on piston rod 67, by screw 68, and has collar 69 against which bears a free collar 70 the thickness of which permits adjusting the level of the plunger plate. Suitable integral webs 71 extend radially from the collar 69 to reinforce the plunger plate 66.

The active or under surface of the plunger plate is bellied or convex, as indicated at 73 (Fig. 3). At the center of a plate, which is generally an oval for hams, with a size of about 10 inches by 7 inches, the belly is about $\frac{5}{8}$ inch from the peripheral edge of the belly, with a smooth curvature. This results in forces laterally from the central area to the periphery, as well as downwardly, as indicated generally by arrows 74, a flange 75 terminating preferably at a distance below the entire belly. The flange 75 is preferably tapered as shown and has a blunt edge. In use, downward movement of this flange tends to move the meat cleanly away from the can side without vertical compression at the can wall, and without squeezing any of it through the clearance space between the can side and the flange 75.

The device shown is particularly designed for simplicity in construction and operation. It requires inserting the prefilled can into the jaws, manually closing the jaws, moving the plunger down, then up, by air or liquid control, unclamping the jaws, and removing the can. The can remains in shape against readily deforming in further handling. The particular manner of constructing the device and operating it, is not to be considered as a limitation, and for the broad purposes of the invention it is to be understood that other constructions may be adopted, for example, to operate on a continuous line of cans moving in one direction, as in a large packing house. The present invention is particularly adapted for the needs of the many small packing houses, where more complicated devices would not be in demand.

The invention permits shaping hams, or other whole meat or the like, for closely fitting into cans, without pre-cooking in shaping containers. All the juices and flavors of the material are saved in the can. The tight fit leaves little or no space to receive juices, and hence there is little or no resultant shrinkage, and little or no liquid or gelatin outside the meat. The process has particular advantage for evacuating raw meat (over cooked meat) or other raw material in a can. Because the gases or air dissolved in the material are releasable on applying vacuum to cause a swelling, they are retained in this invention so to function. The release of gases in the ham by evacuation forms bubbles (as in the painful caisson disease) which in cooking expand and cause the meat to swell as it cooks, into contact with the can, keeping juices within. In evacuating cooked ham or meat in a can, the expansible gas has all been expelled in the precooking process. The cooking phases, and the mechanical phases of the process work in combination toward the desired ends.

The apparatus may be used for forcing hams

and the like into the prior art ham boilers, some of which are sufficiently rigid in construction so that confining the sides is not necessary. Hams thus forced in and cooked in the prior art practice of canning will thus have a better fit in the container, and later the sealed can.

I claim:

1. Apparatus for canning meat and like solid material in a set of cans of various heights and of the same area, comprising in combination, a base for positioning a vertical side-walled topless can with its bottom on said base, movable means to encompass the sides of a can positioned on said base, said means having a contact area on the can wall from the bottom edge upwardly to the vicinity of the top edge of the shortest can of the set, said means being recessed in a direction away from the can for the receipt of an insert to extend said contact area for taller cans, and insert means adapted to be positioned in said recessed means to extend said area to a greater height to accommodate a taller can setting on said base.

2. Apparatus for canning meat and like solid material comprising in combination a base for positioning a vertical side-walled topless can with its bottom on said base, movable means to encompass the sides of a can positioned on said base, said means having a contact area on the can from the bottom edge of the can wall upwardly to the vicinity of the top edge of the can wall, and there being recessed forming a shoulder and space to accommodate any outwardly extending structure of the top edge of the can, and means positionable on said shoulder to provide an area extending said contact area for similar use with a taller can having a side wall extending above said shoulder.

3. Apparatus for canning meat and like solid material comprising in combination a base for positioning a vertical side-walled topless can with its bottom on said base, a pair of horizontally swinging jaws movable to encompass the sides of a can positioned on said base, said jaws together in closed position presenting a contact area on the can from the bottom edge of the can wall upwardly to the vicinity of the top edge of the can wall, and there being recessed forming a shoulder and space to accommodate any outwardly extending structure of the top edge of the can, and means positionable on said shoulder to provide an area extending said contact area for similar use with a taller can having a side wall extending above said shoulder.

4. Apparatus for canning meat and like solid material in a set of cans of various heights and of the same area, comprising in combination, a base for positioning a vertical side-walled topless can with its bottom on said base, means to encompass the sides of a can positioned on said base, said means having a contact area on the can wall from the bottom edge upwardly to the vicinity of the top edge of the shortest can of the set, said means being recessed in a direction away from the can for the receipt of an insert to extend said contact area for taller cans, and insert means adapted to be positioned in said recessed means to extend said area to a greater height to accommodate a taller can setting on said base.

CARROLL L. GRIFFITH.