

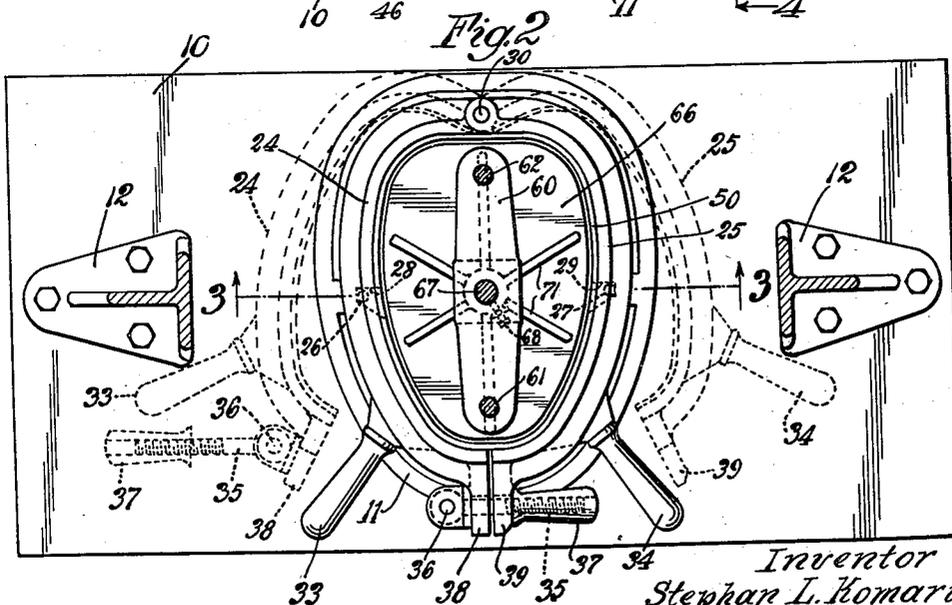
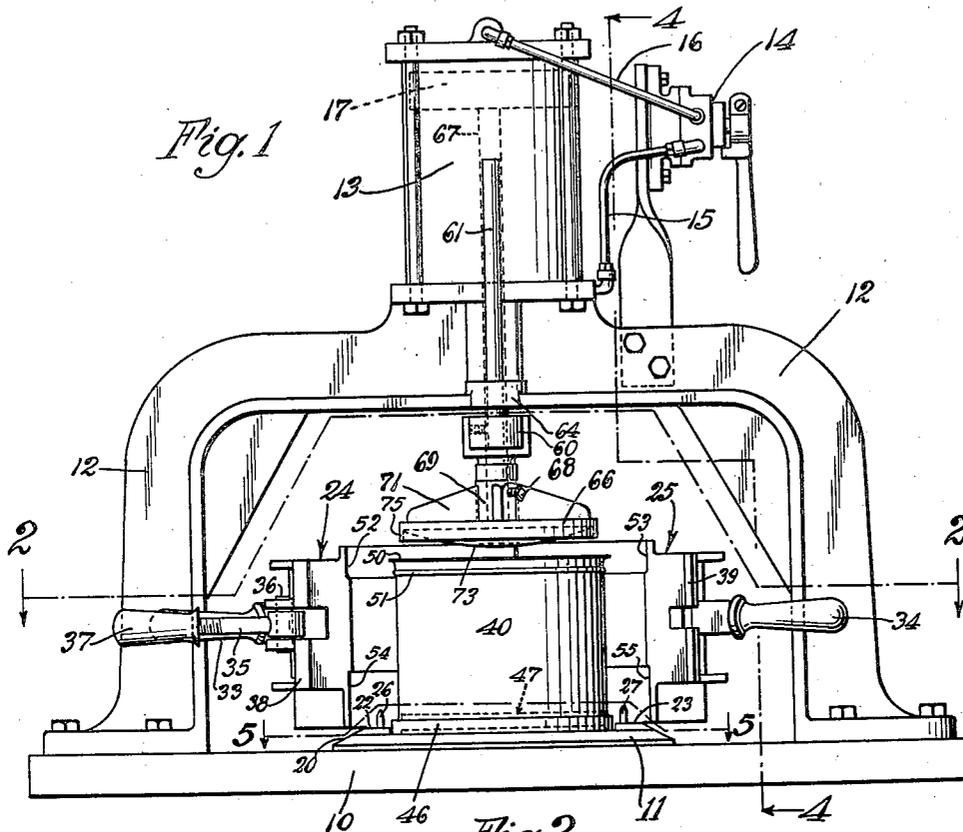
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PROCESS FOR CANNING MEAT

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PROCESS FOR CANNING MEAT

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4 Claims. (Cl. 99—187)

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

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.

Heretofore 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 "pre-cook," 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 precooking 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.

An object of the present invention is to can raw meat, and cook it in the can.

The present invention aims to overcome the above-mentioned 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.

A further object of the invention is the provision of apparatus for inserting a raw ham or the like in a can for leaving a minimum of void space therein.

Another object of the invention is to confine the can laterally against change of form when being filled under mechanical pressure, and forc-

ing the material downwardly and outwardly into the can.

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.

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 noncircular shapes of cans 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 precooking as described above.

Accordingly the first improvement constitutes setting the can 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 to 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. Two raised lugs 22 and 23 at the sides have a bevel edge continuing from the base bevel 20, serving as guides and rests for swinging clamping jaws 24 and 25. The lugs 22 and 23 each have respectively posts 26 and 27, which serve as stops for the jaws, fitting into appropriate recesses 28 and 29 therefor. 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 45. In Fig. 5, the can is not seen on this area 44, because only the can of maximum height should be so used. The drawing is made to illustrate how a lower can may be used. In place of setting the can on area 44, one of a series of adapter-plates is placed thereon. The plate shown is designated 46. It has area 47 comparable to area 44 of the base, and a peripheral lower flange or ring to fit over the area 44 at shoulder 45. The lower face of the plate 46 is adapted to be positioned like a can, and its upper face is adapted to position a can like the base proper.

The device may be made to avoid an adapter plate for each size of can, one plate serving for several sizes. The can wall 40 has a flared top 50, and a reinforcing ring 51 below it. The tops of the jaws are recessed at 52 and 53 to receive these parts in the lowest position shown in Fig. 3 and in higher positions of the can. Likewise the bottoms of the jaws are recessed at 54 and 55 to receive the crimps 42 on cans of smaller size, as they rest on appropriate adapter plates 46.

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 cast wings on yoke 12. A plunger plate 66 is removably 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 height of the belly is about ⅝ 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. The same plate has a peripheral vertical downward flange 75 about ⅝ inch thick, about ⅝ inch deep, and of size to give about ⅛ inch clearance with the sides of the can. This construction keeps meat from squeezing into the clearance space.

The above detailed description relates to the form shown in the drawings. However, the invention is not so limited. I have used a flange which projects beyond the belly, and which has a vertical outer wall and a tapering inner wall. The length and form of the flange may be varied depending upon size, pressure, material, and other factors.

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 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 not only concerns the apparatus, but also the new methods of shaping or canning meat which results from the advantageous use of it. This method has been described except to give details of cooking. These however are not important, and the cooking may be carried in any way as is well known to those skilled in the art, either to produce hams or other meat cooked for preservation when refrigerated, or cooked for complete sterilization to be kept without refrigeration. Cooking for 30 minutes per pound of ham is illustrative.

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 of 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 form 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 invention 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.

The pressure required is not critical and may vary over a considerable range. For hams where a can of about 60 sq. in. of area is used with a 6 inch pneumatic cylinder, from 40 to 60 lbs. per sq. in. of air pressure is suitable. This corresponds to 19 to 28 lbs. per sq. in. on the ham.

Various modifications and applications of the apparatus and the process are contemplated as falling within the scope of the appended claims.

This is a continuation in part of my prior application Serial No. 196,244, filed March 16, 1938, now U. S. Patent No. 2,181,945 issued December 5, 1939, in which the apparatus is claimed.

I claim:

1. The method of canning whole meat which comprises inserting material consisting of whole raw meat into an open topless vertical-walled

can of ultimate volume when sealed substantially equal to the volume of the meat, holding the vertical-walled topless can against deformation from normal shape, forcing the meat over the open area of the can downwardly into the can and laterally from the central top area toward the periphery of the can to provide a slightly concave exposed surface of the meat after forcing into the can, applying a can lid and sealing the can under vacuum, and cooking the raw meat in the sealed can.

2. The method of canning boned ham which comprises inserting material consisting of a raw boned ham into an open topless vertical-walled can of shape corresponding generally to the shape of the ham and of ultimate volume when sealed substantially equal to the volume of the ham, holding the can against deformation from normal shape, forcing the ham over substantially the entire open area of the can downwardly into the can and laterally from the central top area toward the periphery of the can to provide a slightly concave exposed surface of the meat after forcing into the can, applying a can lid and sealing the can under vacuum, and cooking the raw ham in the sealed can.

3. The method of canning whole meat which comprises inserting material consisting of whole raw meat into an open topless vertical-walled can of ultimate volume when sealed substantially equal to the volume of the meat, holding the can against deformation from normal shape, forcing the meat over the open area of the can downwardly into the can and laterally from the central top area toward the periphery of the can to provide a slightly concave exposed surface of the meat after forcing into the can, releasing the can from force preventing deformation whereby the can retains a normal shape because of the physical properties of the raw meat, applying a can lid and sealing the can under vacuum, and cooking the raw meat in the sealed can.

4. The method of canning boned ham which comprises inserting material consisting of a raw boned ham in an open topless vertical-walled can of shape corresponding generally to the shape of the ham and of ultimate volume when sealed substantially equal to the volume of the ham, holding the can against deformation from normal shape, forcing the ham over substantially the entire open area of the can downwardly into the can and laterally from the central top area toward the periphery of the can to provide a slightly concave exposed surface of the meat after forcing into the can, releasing the can from force preventing deformation whereby the can retains a normal shape because of the physical properties of the raw meat, applying a can lid and sealing the can under vacuum, and cooking the raw ham in the sealed can.

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