Dec. 5, 1939. S. L. KOMARIK 2,181,945

APPARATUS FOR CANNING MEAT

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Fig. 1

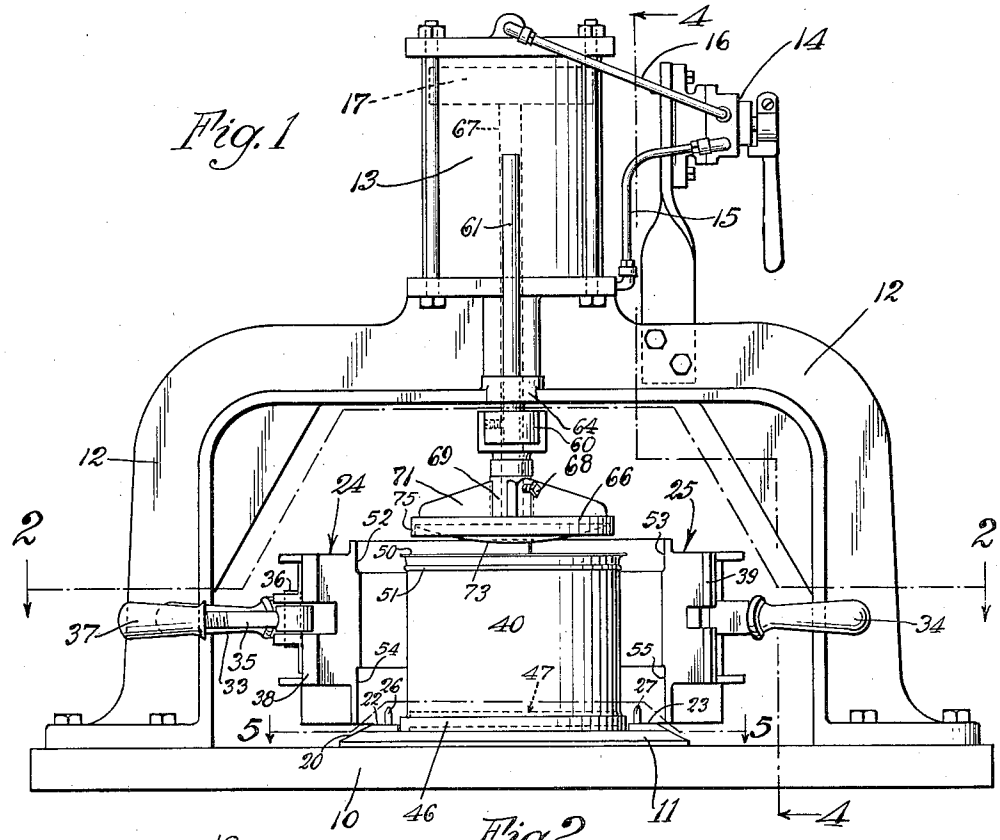
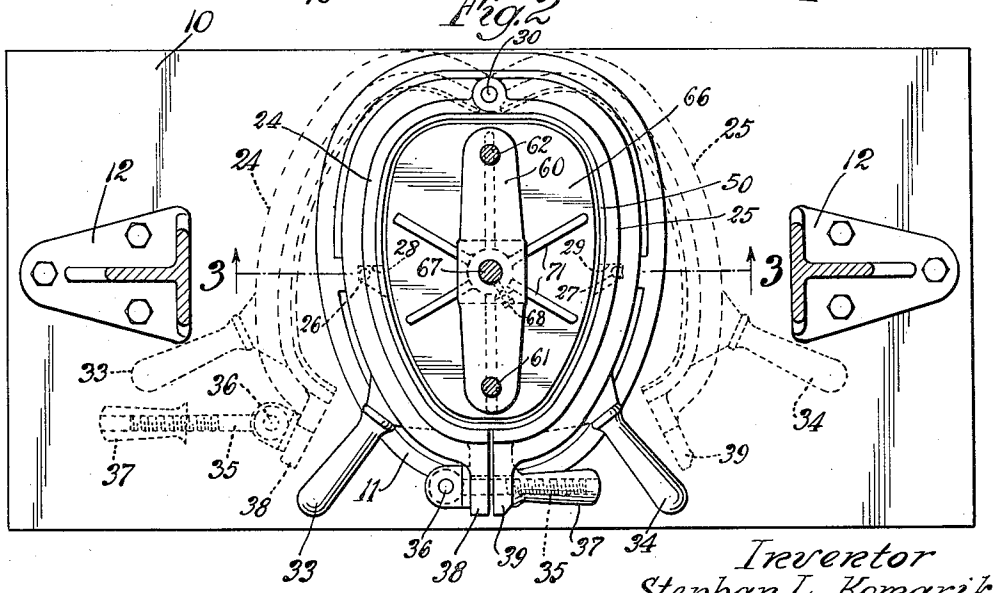


Fig. 2



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Fig. 3

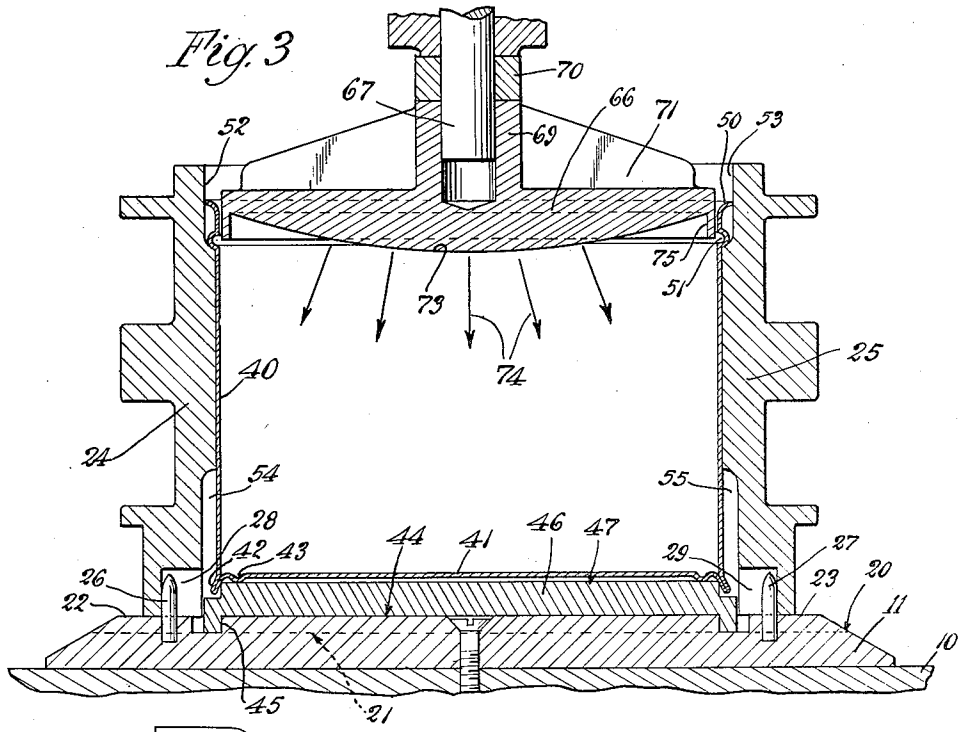


Fig. 4

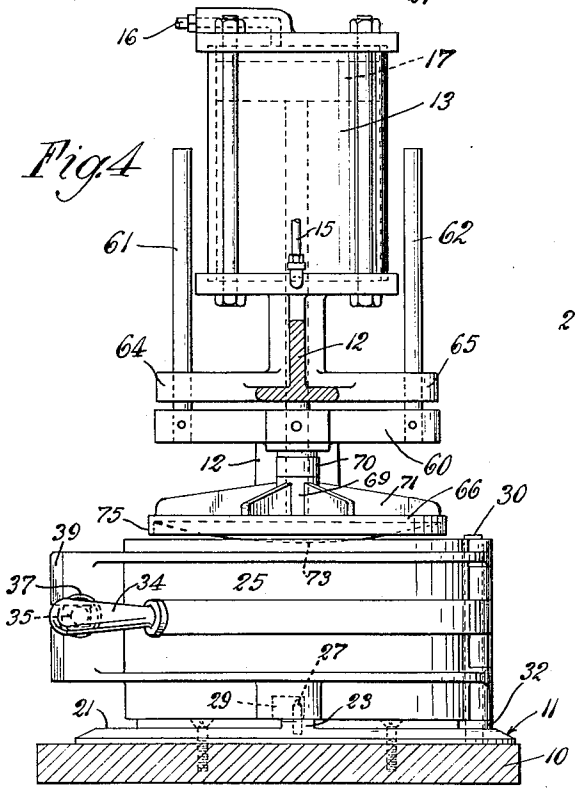
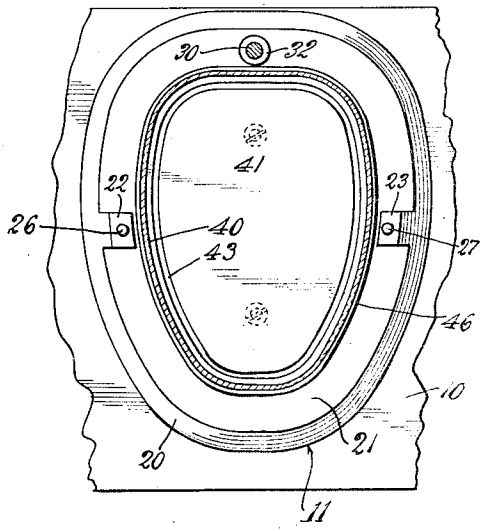


Fig. 5



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2,181,945

UNITED STATES PATENT OFFICE

2,181,945

APPARATUS FOR CANNING MEAT

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Application March 16, 1938, Serial No. 196,244

7 Claims. (Cl. 226—71)

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 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 present invention 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.

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 forcing 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 non-circular 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 pre-cooking 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 side-ways. 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 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 drawings are 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 ⅛ inch thick, about ⅜ inch deep, and of size to give about $\frac{1}{16}$ inch clearance with the sides of the can. This construction keeps meat from squeezing into the clearance space.

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. This however is 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 precooking 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 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.

Reference is made to my copending U. S. application Serial No. 261,799, filed March 14, 1939, as a continuation in part of this application, in which later application is claimed the method of canning meat.

I claim:

1. 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 the can to prevent deformation thereof, a plunger movable into and out of the open top of the can, said plunger covering substantially all the open area of the can with a slight clearance space between its periphery and the interior walls of the can, said plunger having a convex surface exposed to the interior of the can and a peripheral flange projecting towards the interior of the can parallel to the sides of the can.

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 the can to prevent deformation thereof, a plunger movable into and out of the open top of the can, said plunger covering substantially all the open area of the can with a slight clearance space between its periphery and the interior walls of the can, said plunger having a convex surface exposed to the interior of the can and a peripheral flange projecting towards the interior of the can parallel to the sides of the can, the central portion of the convex surface projecting beyond the surrounding flange.

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, relatively movable jaws mounted in fixed association with said base to open and close upon a can on said base for holding the can against deformation in the closed position of the jaws, means for holding the jaws in said closed position, and a reciprocal plunger mounted in fixed association with said base for motion into and out of a can on said base, said plunger having an area sufficient substantially to fill the opening of the can with a slight clearance space at the sides of the can, said plunger having a convex surface presented to the interior of the can and a peripheral flange projecting toward the interior of the can parallel to the sides of the can.

4. Apparatus for canning meat and like plastic solid material into the opening of one of a series of topless cans having the same area and different heights, the cans being characterized by vertical side walls and outwardly projecting parts near the top and bottom of the can with a rim below the bottom wall, said apparatus comprising a base to position the tallest can of the series with its bottom on said base and with its said rim in a positioning recess in said base, clamping means movable to encompass the can to hold it against deformation, said means having a surface for contacting the major portion of the vertical sides of the can between said projecting parts, and further being recessed to accommodate the bottom projecting parts of a can at different levels above said base as when shorter cans are used, one or more adapter plates to lie between said base and the bottoms of the shorter cans of the series, each plate having a downwardly projecting rim on one face and being adapted to be positioned like a can on said base, and on the other face having a rim-receiving recess and being adapted to position a can like said base, and a plunger mounted to move into and out of a can with pressure on the contents exerted at the bottom wall of the can.

5. Apparatus for canning meat and like plastic solid material comprising in combination, means for holding a topless vertical walled can against deformation, and a reciprocal plunger mounted in fixed relation to said means when holding a can for moving into and out of the can, said plunger having a convex surface presented to the can to form a concave interface in the top of the contents of the can, and having also a peripheral flange fencing in said convex surface vertically along the side walls of the can.

6. In a meat-packing device a reciprocally movable plunger for packing meat into a container, said plunger having a convex face and a peripheral flange parallel with the plunger axis.

7. A meat-packing device comprising a container to receive meat, a reciprocally movable plunger with a convex face mounted over said container to enter the container and to spread and pack meat firmly thereinto, said plunger having a peripheral flange extending in the direction of plunger movement and closely fitting the sides of the container at the point of stoppage.

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