Sept. 12, 1944. G. L. CROSS ET AL 2,358,001

CONTAINER FILLING MECHANISM

Filed Jan. 29, 1942 2 Sheets-Sheet 1

Fig. 1.

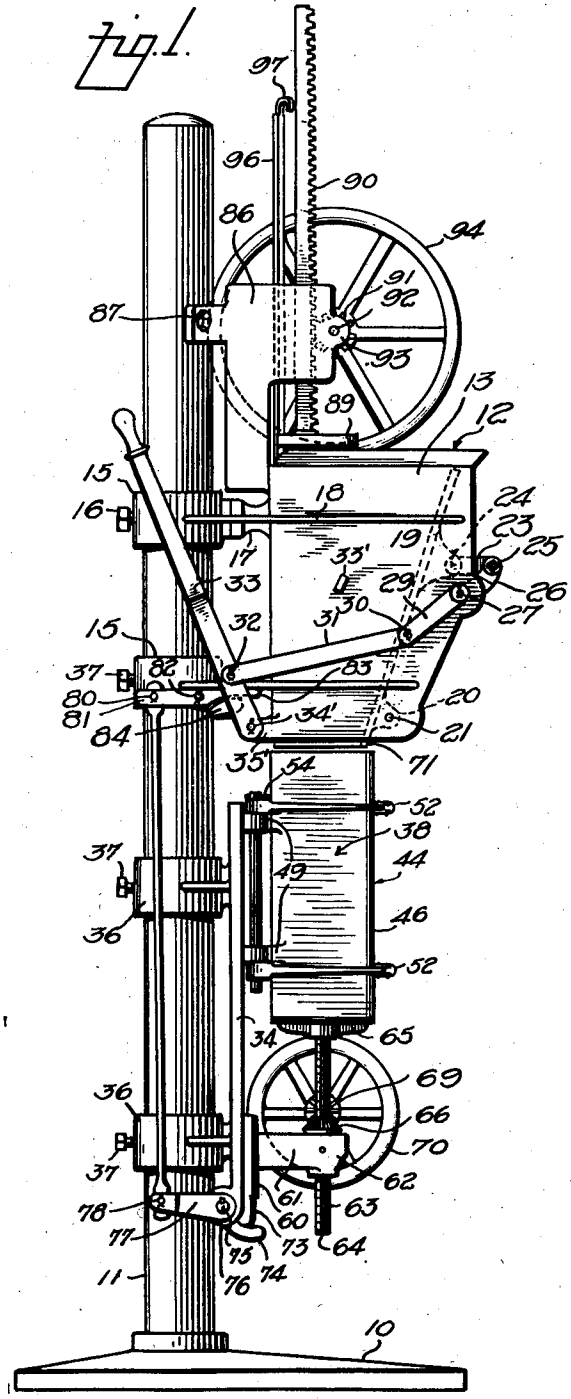
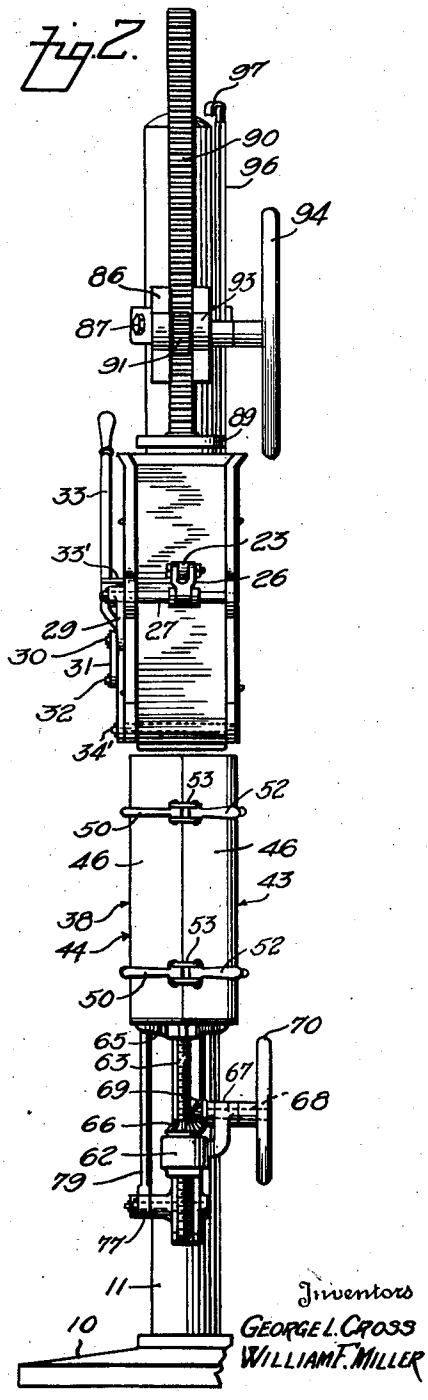


Fig. 2.



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Fig. 3.

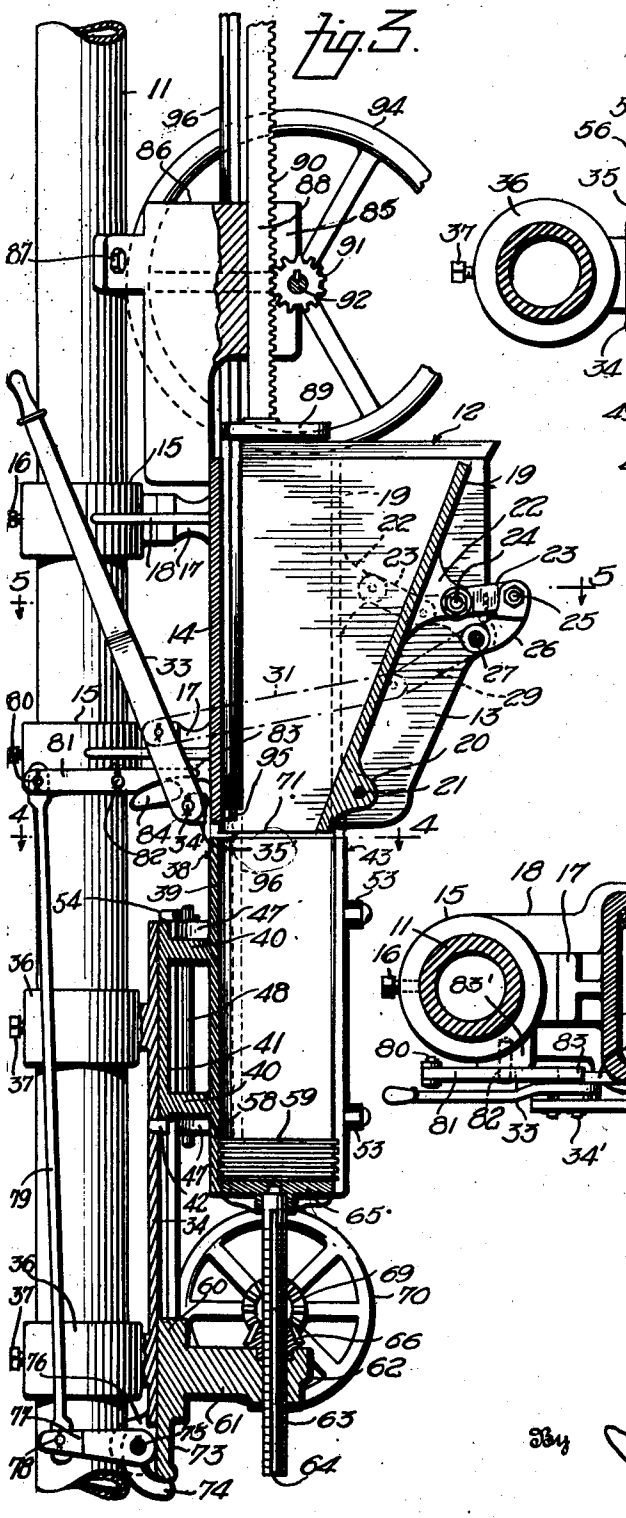


Fig. 4.

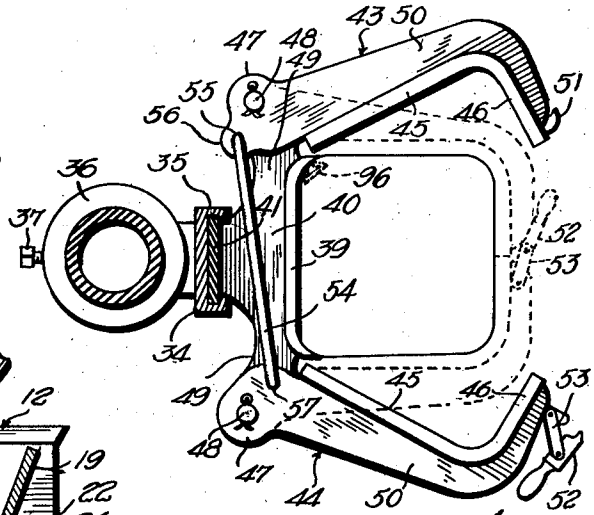
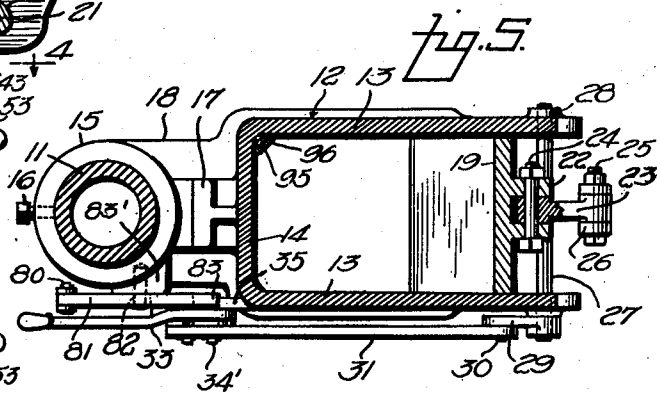


Fig. 5.



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2,358,001

CONTAINER FILLING MECHANISM

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Application January 29, 1942, Serial No. 428,762

6 Claims. (Cl. 226—101)

This invention relates to container filling mechanisms, and more particularly to an apparatus for compressing articles or materials such, for example, as boned hams, and forcing them into cans to be processed.

Heretofore it has been the common practice in the canning of boned hams to first partly compress the ham, place it in a mold, and partially cook the ham while in the mold. The ham is then removed from the mold and placed in a can for further processing. Such operations not only require substantial time and labor, but also result in a definite loss of flavor from the ham due to the partial cooking before the ham is canned, much of the natural juices of the ham being lost.

An important object of the present apparatus is to provide a simple and novel apparatus which is both time and labor saving in that it permits a ham or other article to be quickly deformed to a cross-sectional shape corresponding to the cross-sectional shape of the can, and then to be quickly forced into the can to be processed therein.

A further object is to provide such an apparatus wherein the natural juices normally lost from food products are saved by the procedure referred to, the apparatus serving to quickly and easily deform the uncooked ham into the proper cross-sectional shape for insertion endwise into a can of uniform cross-sectional shape and area to be wholly cooked within the can.

A further object is to provide an apparatus having an article forming mechanism of a novel construction which permits such an article as a boned ham to be wholly received therein and to be quickly deformed thereby into a cross-sectional shape corresponding to that of a can and to provide means in conjunction with such mechanism for immediately forcing the ham into the can while it is held in the cross-sectional shape of the can.

A further object is to provide novel means cooperating with the ham deforming mechanism for supporting beneath such mechanism cans of uniform cross-sectional shape of different length to adapt them to receive hams of different sizes, whereby the upper end of a can of any length may be supported in a position to directly receive a ham from the deforming mechanism.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings we have shown one embodiment of the invention. In this showing—

Figure 1 is a side elevation of the apparatus,

Figure 2 is a front elevation thereof,

Figure 3 is an enlarged fragmentary central vertical sectional view through a portion of the apparatus, parts being shown in elevation,

Figure 4 is a horizontal sectional view on line 4—4 of Figure 3, and,

Figure 5 is a similar view on line 5—5 of Figure 3, parts being shown in elevation.

Referring to Figures 1 and 2, the numeral 10 designates a relatively heavy base which may be secured to any suitable horizontal support and is provided with a heavy vertical standard 11 secured thereto. The standard 11 carries a hopper indicated by the numeral 12 in which hams or other articles of food are to be deformed in the manner to be described. Referring to Figure 5 it will be noted that the hopper comprises side walls 13 and a rear wall 14, integral with each other and preferably integral with supporting collars 15 surrounding the standard 11 and fixed thereto in any suitable manner as, for example, by set screws 16. The hopper wall 14 is secured to the two collars 15 through integral connections 17 and reinforcing webs 18 may be formed integral with the wall 13, collars 15 and connecting members 17. As will become apparent, the hopper 12 remains fixed against vertical movement in the operation of the apparatus.

The hopper 12 further comprises a front wall 19 having a boss 20 through which a shaft 21 extends, to pivotally connect the wall 19 adjacent its lower end to the side walls 13. Mechanism is provided for swinging the wall 19 inwardly to a vertical position parallel to the rear wall 14. The wall 19 is provided with a pair of ears 22 between which is arranged one end of a lever 23, and a bolt or shaft 24 extends through the ear 22 and the end of the lever 23 referred to. The other end of the lever 23 is pivotally connected as at 25 to one end of a crank 26 and this crank is fixed to a shaft 27 journaled in the side walls 13 as at 28.

Outwardly of the hopper, the shaft 27 carries a crank 29 having its free end pivotally connected as at 30 to one end of a link 31. This link has its other end pivotally connected as at 32 to a hand lever 33 the lower end of which is pivotally connected as at 34' to a boss 35' formed integral with the body portion of the hopper 12. It will be obvious that if the lever 33 is swung in a clockwise direction as viewed in Figure 1, the link 31 will turn the crank 29 in a counterclockwise direction to impart similar movement to the crank 26 to cause the latter to operate through the link

23 to swing the wall 19 inwardly. When the wall 19 occupies its normal position shown in Figures 1 and 3, the shape and capacity of the hopper 12 is such as to adapt it to receive various sizes of boned hams. The operation of the lever 33 in the manner stated deforms the ham, causing it to partake of a uniform cross-sectional shape to be forced downwardly into the can to be described. The wall 13 adjacent the lever 33 is provided with a lug 33' to serve as a stop for limiting movement of the lever 33.

A vertical guide 34 (Figures 3 and 4) having guide grooves 35, is arranged adjacent and parallel to the standard 11. The guide 34 may be formed integral with collars 36 slidably surrounding the standard and normally fixed against movement with respect thereto by set screws 37. A can holder indicated as a whole by the numeral 38 is supported by but normally does not slide with respect to the guide 34. The can holder comprises a rear wall 39 having integral connection as at 40 with a plate 41, the edges of which are arranged in the guide grooves 35. A pin 42, extending through the guide 34 (Figure 3) supports the plate 41 in its normal position.

Two door elements respectively indicated as a whole by the numerals 43 and 44 cooperate with the wall 39 to encircle a can in the holder 38. Each door element comprises a side wall 45 and a front wall section 46, the front wall section cooperating to close the front of the can holder when brought together to the position shown in Figure 2. Each door element is provided with upper and lower ears 47 pivoted as at 48 to ears 49 formed integral with the integral connections 40. Each of the ears 47 of the door elements is formed integral with and as an extension of integral reinforcing flanges 50 formed on the door elements, as will be apparent.

One front wall section 46 is provided with an integral lug 51 engaged by a manually operable latch element 52 carried by a link 53 pivotally connected to the other front wall section 46. The unlocked position of the latch element 52 is shown in Figure 4 and it will be obvious that when the doors are swung to closed position the latch element 52 swings with the link 53, and then swings independently of these links to a locked position in engagement with the lug 51. This type of latch mechanism obviously is conventional, and it will be apparent that any locking means for the door elements may be employed.

Means is preferably provided for effecting simultaneous movement of the door elements 43 and 44. A connecting link 54 is pivotally connected at one end as at 55 to an ear 56 carried by the reinforcing flange 50 of one door element, while the other end of the link 54 is pivotally connected as at 57 to the flange 50 of the other door element, the arrangement of the pivot points 55 and 57 with respect to the respective pivots 48 being such as to provide reverse swinging rotation of each door element with respect to the other. Swinging movement of one door element toward open position therefore results in swinging movement of the other door element in the opposite direction toward its open position.

When the door elements are in the closed position shown in Figure 2, and shown in dotted lines in Figure 4, they define a vertical space of general rectangular form corresponding to the cross-sectional shape of the cans to be filled with the apparatus. It will be obvious, of course, that the invention is not limited to use with cans of any particular cross-sectional shape. The inner face of the wall 39 is provided with a series of spaced grooves 58, while the inner surfaces of the side walls 45 and end wall sections 46 are similarly provided with spaced sets of grooves 59, each groove 58 being arranged in the plane of one groove 59 of each door element. These grooves are provided for the purpose of receiving beads at the lower ends of the cans to be filled, and a plurality of spaced grooves is provided to accommodate cans of different heights.

A crosshead 60 is mounted for vertical sliding movement in the guide 34. This crosshead is provided with an integral arm 61 terminating in a bearing 62 in which is slidably arranged a screw shaft 63 having a vertical groove 64 for splined connection with the bearing 62. The upper end of the screw 63 carries a head 65 forming the lower end of the can holder and constituting a pressure element for a purpose to be described.

The head 65 is vertically adjustable in accordance with the heights of different cans. For this purpose a bevel gear 66 is supported by the bearing 62 and is threaded on the shaft 63. The arm 61 has a vertically arranged bearing extension 67 for supporting a shaft 68 having a bevel gear 69 at its inner end meshing with the bevel gear 66. A hand wheel 70 on the shaft 68 is provided for rotating the gears 69 and 66 to effect vertical movement of the shaft 63 and head 65.

After the deforming of a ham or other food article in the hopper 12 the can holder and associated elements are movable upwardly to close the gap between the upper end of the can holder and the lower end of the hopper 12. The can holder is normally slightly spaced beneath the hopper and in order to seal the gap between these two elements when the can holder is moved upwardly, the side and rear walls of the hopper are provided with a thin depending flange 71 integral therewith and adapted to project downwardly into the upper end of the can holder.

The crosshead 61 is provided with a depending projection 73 engaging a cam element 74 and this means supports the crosshead 60 in the desired position and is operative, under conditions to be described, for moving the crosshead and its associated elements and the can holder upwardly when the can is to be filled. The cam 74 is carried by a shaft 75 journaled in an ear 76 carried by the guide 34. A crank 77 is carried by the shaft 75 and is pivotally connected as at 78 with the lower end of a link 79. The upper end of this link is pivotally connected as at 80 with one end of a lever 81 and this lever is pivoted as at 82 to an enlargement 83' carried by the lower of the two collars 15. The other end 83 of the lever is reduced in size and bears upon a cam 84 welded or otherwise secured to the lever 33. It will become apparent that operation of the lever 33 to swing the wall 19 (Figure 3) of the hopper 12 likewise operates the lever 81, link 79, crank 77 and cam 74 to elevate the can holder 38 and associated elements.

Means is provided for forcing a deformed ham downwardly from the hopper 12 into the can. A guide groove 85 (Figure 3) is formed in a support 86 secured as at 87 to the standard 11 and preferably secured at its lower end in any suitable manner (not shown) to the wall 14. A vertical rack bar 88 is slidable in the groove 85 and carries at its lower end a head 89 approximately of

the cross-sectional shape and size of the interior of the hopper 12 when the wall 19 thereof is in the vertical dotted line position shown in Figure 3. The teeth 90 of the rack bar 88 mesh with a pinion 91 carried by a shaft 92 rotatably supported in bearings 93 formed integral with the support 86. A hand wheel 94 on the shaft 92 permits an operator to actuate the head 89.

In forcing a ham or other food article downwardly into a can in the holder 38 it is highly desirable to permit the free escape of air from the bottom of the can so that the can may be properly evacuated prior to the processing operation. Referring to Figure 5, the numeral 95 designates a vertical rib welded to or formed integral with one corner portion of the hopper 12 and having its projecting portion of tapered shape as shown. This rib 95 extends substantially throughout the height of the hopper 12, as shown in Figure 3. A sheet metal vent element 96 is bent transversely so that its interior corresponds in cross-sectional shape and size to the tapered portion of the rib 95. The vent element is slightly longer than the total vertical length of the hopper 12 and the longest can to be filled with the apparatus. The vent element 96 normally has its lower end terminating at or slightly above the bottom of the hopper 12 so that its upper end projects a substantial distance above the hopper, as shown in Figure 1. The upper end of the vent element 96 is provided with a finger piece 97 to facilitate the operation of this element.

The operation of the apparatus is as follows:

The door elements 43 and 44 of the can holding mechanism are opened to the position shown in Figure 4, whereupon the operator selects a can of the proper height in accordance with the volume of the ham or other article to be canned. The operator will place the can in the can holder against the rear wall 39 thereof with the head at the lower end of the can in the proper groove 58 in accordance with the height of the can, the top of the can being arranged approximately at the upper end of the can holder. The can will be held in position while the hand wheel 70 (Figures 1 and 2) is rotated in the proper direction to elevate the head 65 (Figure 3). The screw 63 is slidable in the bearing 42 but is fixed against rotation with respect thereto and accordingly rotation of the wheel 70 in the proper direction causes the bevel gear 69 (Figure 2) to rotate the bevel gear 66 and thus feed the screw 63 upwardly until the head 65 contacts with the bottom of the can to support it. The operator will then move one of the door elements 43 or 44 manually to closed position and the link 54 (Figure 4) will swing the other door element to the same position, whereupon the operator can engage the latch 53 behind the lug 51 to lock the door elements 43 and 44 in the closed position shown in Figures 1 and 2. If necessary, the hand wheel 70 may be slightly further rotated to tightly engage the head 65 (Figure 3) with the bottom of the can.

The apparatus is particularly intended for use in the canning of boned hams the sizes of which vary and require the use of cans of different heights. It is for this reason that the means described above is provided, cans of different heights being employed in accordance with the volume of the ham. The proper can having been selected, and placed in position, the operator will then press downwardly on the finger piece 97 (Figure 1) to move the vent element 96 downwardly to project the lower end of such element into the can to a point adjacent the bottom thereof. The boned ham is then dropped into the top of the hopper 12 with the parts arranged in the position shown in solid lines in Figure 3. It will be apparent that with the forward wall 19 of the hopper in its outer inclined position, the capacity of the hopper is such as to easily receive a ham of the largest size ordinarily employed in canning. Such ham will be in a loose open position due to the removal of the bone therefrom and the ham is dropped endwise into the hopper.

The operator will then grasp the handle at the upper end of the lever 33 and move it forwardly, that is, to the right as viewed in Figures 1 and 3. This action swings the crank 29 (Figures 1 and 3) in a counter-clockwise direction to impart similar movement to the crank 26. The free end of the crank 26 will force the link 23 inwardly, thus swinging the wall 19 toward vertical position. The operator, because of the leverage provided can readily swing the lever 33 until the wall 19 assumes a vertical position. When this position is reached, the lever 33 will engage the lug 33' to limit further movement of the lever, and the crank 26 and link 23 will assume positions in alignment with each other so that the pressure of the ham against the wall 19 will be taken up through the crank and link referred to and through their aligned pivots, thus relieving pressure on the lever 33. The wall 19 having been moved to its vertical position, it will be apparent therefore that no force is required on the part of the operator to hold the wall 19 in position.

Referring to Figures 1 and 3, it will be noted that when the lever 33 is swung to the right to deform the ham within the hopper 12, the cam 84 will be moved to the right and obviously swings about the axis of the pivot 34. The cam 84 swings upwardly and to the right and engages the reduced end 83 of the lever 81 to move it upwardly. This operation effects downward movement of the link 79 and downward swinging movement of the crank 77, and since the cam 74 is operable by the crank 77, the cam 74 will swing upwardly. The depending projection 73 engages the cam 74 and upward movement of the latter accordingly moves the projection 73 and consequently the crosshead 60 upwardly. This operation elevates all of the elements carried by the crosshead 60 and since the head 65 (Figure 3) is in firm engagement with the bottom of the can in the holder 38, and since the can is fixed against relative vertical movement with respect to the can holder by engagement of the lower bead thereof in the grooves 58 and 59, it will be apparent that upward movement of the head 65 elevates the can and the entire holder 38. This holder is carried by the plate 41 which slides in the guide 34. It will be apparent therefore, that the operation of the lever 33 to deform the ham 20 simultaneously elevates the can and the holder 38, and this operation moves the upper end of the can holder approximately into contact with the lower end of the hopper 12 while the flange 71 enters the upper end of the can.

The operator will now rotate the hand wheel 94 and engagement of the pinion 91 will move the rack bar 88 and pressure head 89 downwardly. As previously stated the head 89 is of a shape and size corresponding to the rectangular cross-sectional shape of the inside of the hopper 12 when the wall 19 is in vertical position. It will be obvious, of course, that one corner of the head 89 will be cut away to provide a notch through which the vent element 96 is operable. Downward movement of

the head 89 brings it into contact with the upper end of the deformed ham within the hopper and continued downward movement of the head 89 forces the ham downwardly into the can within the can holder 38. The flange 71 (Figure 3) will extend into the upper end of the can and the head 89 is movable downwardly to a position within the flange 71 to force the ham completely into the can with the upper extremity of the ham slightly below the upper extremity of the can to permit the latter to be readily capped.

It will be apparent that while the ham is being forced downwardly into the can, the vent element 96 will be in position within the can and will extend substantially to the bottom of the can. The ham will have been deformed to a shape and size approximately equal to the cross-sectional shape and size of the can and accordingly the ham, in being forced downwardly into the can, will contact with the walls of the can. This ordinarily would involve two distinct disadvantages. In the first place, the ham would trap air in the bottom of the can and the downward movement of the ham would progressively build up air pressure in the can which would make it difficult to force the ham all the way to the bottom of the can. In the second place, it would result in the final trapping of at least some air in the bottom of the can and this air is not readily removable when the can is evactuated at the time of the capping thereof. With the use of the vent element described, the ham may be moved easily downwardly into contact with the bottom of the can, the air in the bottom of the can freely escaping upwardly through the vent element 96. Thus the building up of pressure is prevented and the formation of air pockets in the bottom of the can will be prevented, thus permitting proper evacuation of the can prior to processing.

After the ham has been forced into the can in the manner stated the operator will first grasp the finger piece 97 (Figure 1) of the vent element, and will pull this vent upwardly to its inoperative position shown in Figure 3. The vent element 96 slides upwardly over the rib 95 and substantially fits this rib, and during upward movement of the vent element, the lower end of the rib 95 will scrape any meat or fat from the interior of the vent element, thus keeping this element clean.

When the vent element has been withdrawn, the operator will move the lever 33 back to its inoperative position shown in solid lines in Figures 1 and 3 and this operation will restore the wall 18 to its inoperative position shown in solid lines in Figure 3, and will swing the cam 74 (Figure 3) back to its inoperative position. The latter operation permits the weight of the can holder, slide 86, etc., to move these elements back to their normal positions, the plate 41 of the cam holder again resting on the pin 42. The operator will then grasp the handle of the latch 52 (Figure 4) and swing it to open position, whereupon the door elements 43 and 44 may be swung to the open position shown in Figure 4 to permit the removal of the filled can and the insertion of an empty can into the can holder.

From the foregoing it will be apparent that the present apparatus greatly simplifies the procedure involved in deforming hams or the like and placing them in cans to be sealed and processed. An empty can of any desired height, according to the volume of the ham, may be placed in the can holder and the ham dropped into the hopper 12, whereupon it is merely necessary for the operator to swing the lever 33 to operative position, after having inserted the vent element into the can, and then rotate the hand wheel 94. All of the various operations involved require very few seconds and accordingly it will be apparent that the apparatus, while quite simple and compact in construction, effects a great saving in the time and labor involved in filling the cans.

Moreover, the apparatus provides simple and effective means for deforming an uncooked ham, without the necessity for partially cooking the ham before placing it in the can and accordingly all of the cooking of the ham takes place in the can. All of the natural juices of the ham are thus preserved and the final product is accordingly substantially improved in quality.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

We claim:

1. An article deforming mechanism comprising a hopper having opposite parallel walls, a third wall connected to said parallel walls and a movable wall pivoted adjacent one end to said parallel walls opposite said third wall and normally diverging therefrom toward one end of the hopper, said last named wall being movable to a position parallel to said third wall to form a chamber of uniform cross sectional area, movement of said movable wall to its operative position being adapted to deform an article in the hopper to cause it to assume a substantially uniform cross sectional shape corresponding to that of said chamber, a lever, and motion transmitting connections between said lever and said movable wall, said connections comprising a crank, and a link pivotally connected to the free end of said crank and to said movable wall, the points of pivotal connection of said link and the turning axis of said crank being arranged to lie substantially in a common plane when said movable wall is in operative position.

2. An article deforming and container filler mechanism comprising a hopper having a wall movable to deform an article in the hopper, means for supporting an open-ended container adjacent one end of said hopper in alinement with the deformed article therein, said supporting means comprising can receiving walls mounted for opening movement for the lateral insertion of a can thereinto, said walls being grooved to receive the lower bead of cans of varying heights, means for supporting said walls for sliding movement longitudinally of said hopper, said supporting means further comprising an end member remote from said hopper mounted for movement independently of said walls, means for moving said end member relative said walls into engagement with the bottom of a can in said walls, and common means for moving said end member toward said hopper to bring the open end of the can substantially into engagement therewith to receive an article therefrom and for moving the movable wall of said hopper to deform an article therein.

3. An article deforming and container filling mechanism comprising an open-ended hopper having at least one wall thereof movable to deform an article therein into substantially uniform cross sectional shape, means for supporting an open-ended container adjacent one end of the hopper in alignment with the deformed article therein, said supporting means compris-

ing can-receiving walls mounted for movement in alignment with the deformed article and having limited movement away from said hopper, said supporting means having an end member mounted for movement for adjustment relative to said can-receiving walls to position a container in said supporting means in accordance with the length of the container, means for supporting said end member for such movement, and means for bodily moving said supporting means, including said end member, to bring the open end of the container substantially into engagement with said end of the hopper to receive the deformed article therefrom.

4. An article deforming and container filling mechanism comprising an open-ended hopper having at least one wall thereof movable to deform an article therein into substantially uniform cross sectional shape, means for supporting an open-ended container adjacent one end of the hopper in alignment with the deformed article therein, said supporting means comprising can-receiving walls mounted for movement in alignment with the deformed article and having limited movement away from said hopper, said supporting means having an end member mounted for movement for adjustment relative to said can-receiving walls to position a container in said supporting means in accordance with the length of the container, means for supporting said end member for such movement, means for bodily moving said supporting means, including said end member, to bring the open end of the container substantially into engagement with said end of the hopper to receive the deformed article therefrom, and a lever for actuating said movable wall to deform the article in the hopper, said lever being connected to said last named means to actuate it to move said container supporting means.

5. An article deforming and can filling mechanism comprising a hopper open at both ends and operative for deforming an article therein to cause it to assume a shape having a uniform cross sectional area, can-supporting means adjacent one end of said hopper for supporting an open-ended can in alignment with the deformed article to receive the same, said supporting means comprising walls movable to open position to receive a can and provided with spaced grooves to selectively receive the beads adjacent the lower ends of the cans in accordance with the lengths of the cans, a head movable relative to said walls to engage the bottoms of cans of different lengths to support the cans during the filling operation, and means for supporting said head for such relative movement.

6. An article deforming and can filling mechanism comprising a hopper open at both ends and operative for deforming an article therein to cause it to assume a shape having a uniform cross sectional area, can-supporting means adjacent one end of said hopper for supporting an open-ended can in alignment with the deformed article to receive the same, said supporting means comprising walls movable to open position to receive a can and provided with spaced grooves to selectively receive the beads adjacent the lower ends of the cans in accordance with the lengths of the cans, a head movable relative to said walls to engage the bottoms of cans of different lengths to support the cans during the filling operation, means for supporting said head for such relative movement, and mechanism having a common operating lever for effecting the deforming of the article in said hopper and for bodily moving said can supporting means, including said head, to bring the open end of the can substantially into contact with the adjacent end of the hopper to receive the article therefrom.

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