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CONTAINER FILLING MECHANISM

Filed April 3, 1941

2 Sheets-Sheet 1

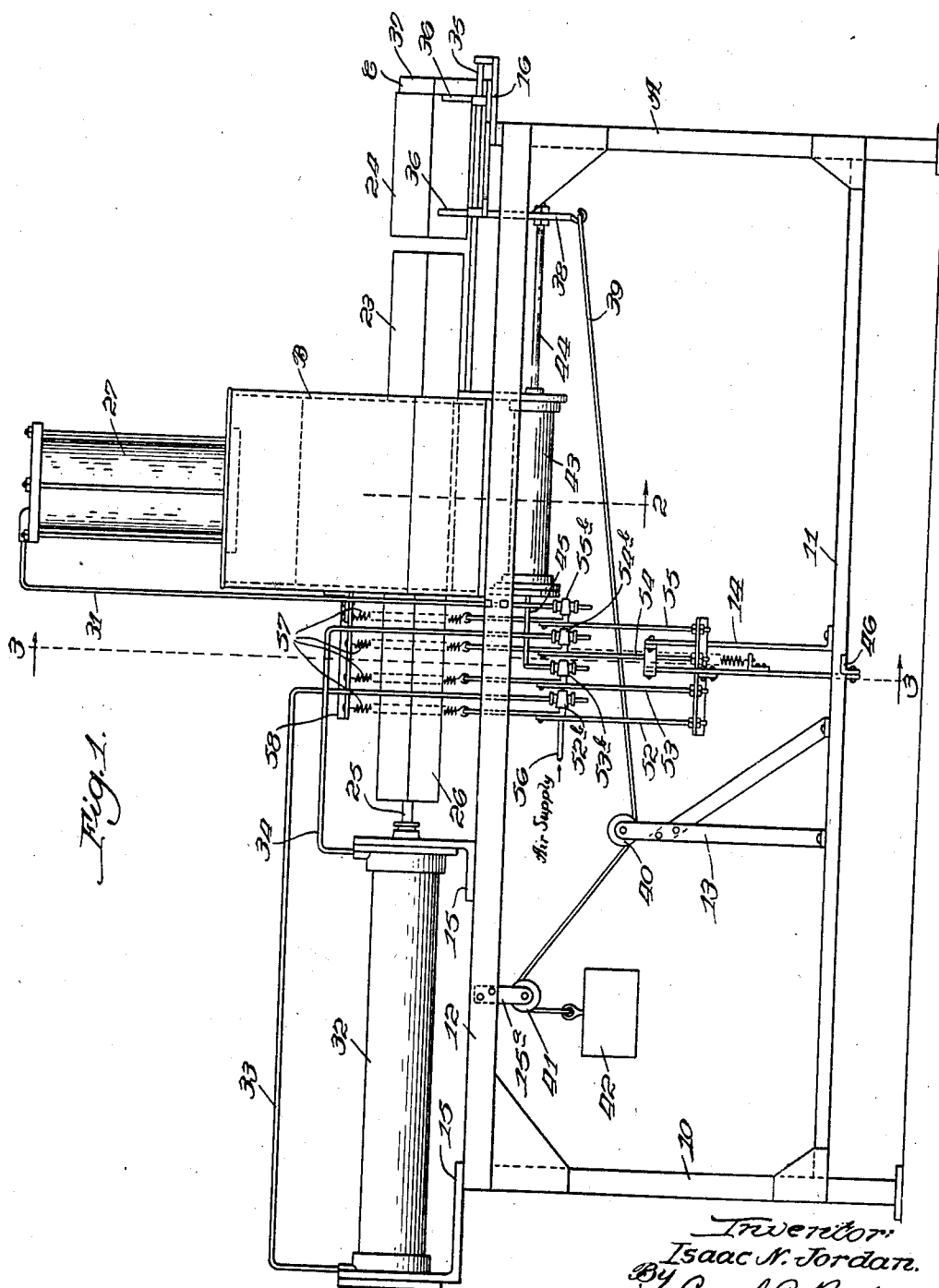


Fig. 1.

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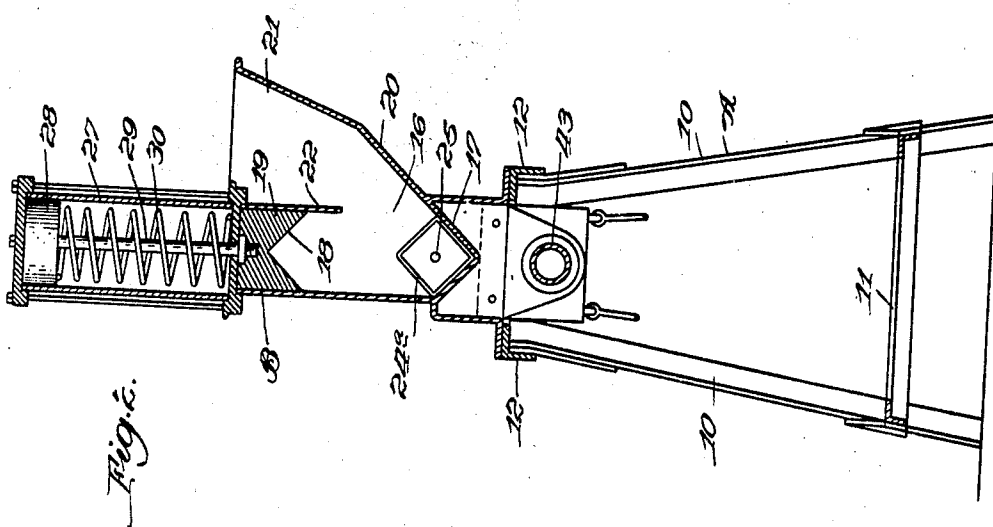
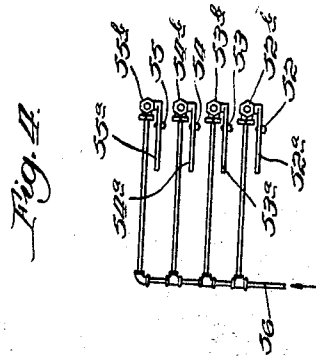
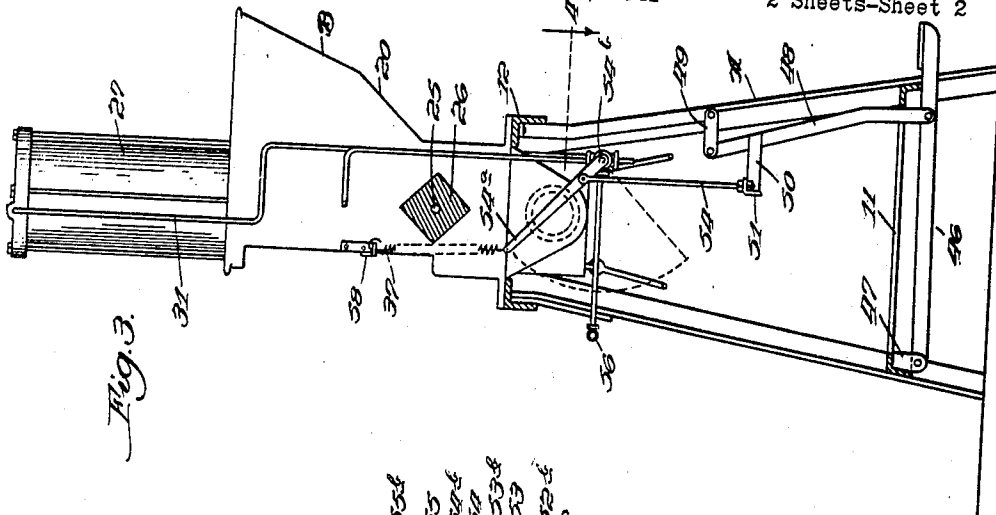
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UNITED STATES PATENT OFFICE

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CONTAINER FILLING MECHANISM

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5 Claims. (Cl. 226—101)

This invention relates to a container filling mechanism and is particularly useful for filling cans or other containers with chopped corn beef and meat and other products.

An object of the invention is to provide apparatus by which measured amounts of meat or other products may be quickly fed and packed within a container of a specific shape. A further object is to provide means wherein an attendant can rapidly feed successive amounts of a product into an open receptacle, then by operating a single treadle shape the product within the receptacle and fit the same within a container, the filled container being then automatically released for removal. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a preferred embodiment in which—

Figure 1 is a side elevational view of an apparatus embodying my invention; Figure 2, a transverse sectional view, the section being taken as indicated at line 2 of Figure 1; Figure 3, a transverse sectional view, the section being taken as indicated at line 3 of Figure 1; and Figure 4, a broken plan detail view of the valve structure employed.

In the illustration given, A designates a frame; B, a stuffing hopper; C, a can carriage device.

The frame structure A may be of any suitable form or type. In the illustration given, there are provided legs or pedestals 10 with a lower bed structure 11 and an upper bed or table structure 12. The bed structure 11 carries the pulley brace 13 and the valve rod supporting structure 14. The upper bed or table carries a pulley strap 15a. The bed 12 also carries the air cylinder supporting brackets 15 and the carriage supporting bracket 16.

The hopper structure B rests directly upon the table or bed 12. It provides a stuffing chamber 16 of the shape illustrated more clearly in Figure 2. The bottom wall 17 of the chamber is generally V-shaped providing approximately one-half of a rectangular channel. The upper half of the rectangular channel is provided by the inverted V-shaped bottom or face 18 of the press 19. One wall 20 of the bottom of the chamber is extended laterally and the continuation thereof forms an open port 21 through which the meat or other products may be introduced. The casing provides end walls and side walls. The side wall 22, however, is interrupted so as to provide communication between the port 21 and the interior of chamber 16. The chamber 16 is provided with an outlet nozzle or guide 23 which extends rearwardly of the hopper and is adapted to snugly receive a rectangular can 24. When the press 19 is in lowered position it forms a channel which is evenly aligned with the outlet guide 23. A

plunger head 24a carried by compressed air operated rod 25 fits evenly within the channel provided by the bottom 17 of the chamber and the press head 19 and when forced forwardly causes the meat to be discharged through the channel and through the outlet guide 23. The plunger rod 25 is guided within a block 26 secured to the hopper casing.

For reciprocating the press 19, a cylinder 27 is supported upon the hopper casing B and is provided with a piston 28. A piston rod 29 is fixed to the piston 28 and to the press 19. A spring 30 normally urges the piston 28 toward its upper position. Compressed air is fed through line 31 into the top of the cylinder 27 to move the piston 28 downwardly.

For actuating the plunger rod 25 a compressed air cylinder 32 is illustrated, supported upon brackets 35 and provided with an air pipe 33 communicating with one end and another air pipe 34 communicating with the other end thus enabling the piston within the cylinder to be moved in either direction.

The can carriage C may be of any suitable construction. In the illustration given, it comprises rod members 35 supporting can carrying arms 36 and pressure end member 37. Secured to the carriage is a depending plate 38 to which is secured a cable 39. The cable extends under pulley 40 carried by the bracket 13 and over the pulley 41 suspended by bracket 15a and is provided with a heavy weight 42 which urges the carriage C toward the can guide 23. A compressed air cylinder 43 is supported below the hopper B and is provided with a piston secured to a rod 44, the forward end of the rod being fixed to plate 39. Compressed air is introduced into the rear of the cylinder 43 through line 45.

For controlling the operation of the entire mechanism in the proper sequence, I have provided valve structure which is controlled by a single treadle. The treadle 46 is pivotally secured upon a bracket 47 and when depressed lowers a vertical link 48. The link at its top is pivotally connected to a short link 49 having one end pivotally connected to the frame A. Secured to the vertical link 48 is a rigid arm 50 supporting an angle iron plate 51. To plate 51 are secured four valve rods 52, 53, 54 and 55. The rod 52 is pivotally secured to a valve lever arm 52a which rotates the core of a valve 52b. Similarly, the rod 53 is connected to the valve lever 53a controlling valve 53b. Similarly, the valve rod 54 is connected to the valve lever 54a controlling valve 54b. And likewise, the rod 55 is connected to the valve lever 55a controlling the valve 55b. Compressed air enters the valve through the inlet 56. Leading from the valves are the compressed air lines 31, 33, 34 and 45. Each of the valves is also provided with a port through which the com-

pressed air may be vented to the atmosphere from one side of the piston when it is desired to move the piston toward that side. Each of the valve lever arms 52a, 53a, 54a and 55a is provided with a spring 57, the upper end of which is secured to a bracket 58 carried by the hopper casing.

Operation

In the operation of the device, an empty can 24 is placed upon the carriage C with the open end of the can facing the guide 23. Upon the first movement of the treadle downwardly, compressed air is released from the cylinder 43 through the valve port in valve 53b and under the influence of the weight 42 the carriage moves toward the hopper B and the can 24 is received upon the guide 23. A measured amount of the chopped corn beef or other meat or products has been introduced through the open port 21 and guided into the hopper bottom 17. The continued downward movement of the treadle 46 causes valve 55b to admit air through line 31 to the top of cylinder 27. Piston 28 then moves downwardly and the press head 19 descends closing off communication with the open port 21 and forming a channel with the bottom of the hopper 17. This channel is the shape of the container or can 24 and the plunger head 24a and it provides a continuous channel communicating evenly and without break with the guide 23 so that the meat after being reduced by means of the press 19 to a product of the desired shape may be pressed evenly into a container of the same shape. Continued downward movement of the treadle next causes valve 52 to admit compressed air through line 33 into cylinder 32 and the piston therein forces the plunger rod 25 toward the hopper 13 thus causing the plunger head 24a to advance the meat within the channel in the bottom of the hopper through the guide 23 and into the container 24. The yielding pressure carriage C maintains a uniform pressure against the advancing meat body so as to insure the even filling of the container, as the container moves away from the hopper B thus lifting the weight 42. When the pedal is released, valve 53b is opened to allow compressed air to flow into the cylinder 43 to force the plunger 44 forwardly to the position shown in Figure 1. By this movement the carriage C is advanced to free the container 24 completely from the guide 23. In this position the filled can 24 may be readily removed. In each of the foregoing operations which have been described, and where a power cylinder is employed, the valves release the air from the side of the cylinder toward which movement is to be made. For example, when the piston stroke in cylinder 32 is toward the hopper B, air is released through line 34 and valve 53b and vice versa, when the structure is in the opposite direction, air is released through line 33 and valve 52b. In the initial downward movement of the treadle, air is released through line 45 and valve 53b to permit the carriage to be drawn toward hopper B. This is followed by the operation of 54b in releasing air through line 34. On the upward movement of the pedal, valve 55b releases the air pressure from the top of cylinder 29 permitting the piston, under the force of the spring to be returned to its upper position. Also, air is released through pipe 33 and valve 54b, while at the same time, air is admitted through valve 54b into line 34 to effect a retraction of plunger rod 25.

In the sequence of operations described, it will be noted that a measured quantity of meat is in-

troduced into the hopper, the can is fitted upon the guide 23 under the influence of weight 42, air being released from cylinder 43 through line 49 and valve 53b. The pressure head 19 then descends to form the rectangular channel with the bottom of hopper 17. The plunger 25 then advances to press the meat within the channel forwardly through guide 23 and into container 24, the carriage C yielding while at the same time exerting pressure against the incoming product which is filling the container 24. The forward stroke of the cylinder rod 44 then releases the filled container 24 from engagement with the guide 23 so that it may be removed. Upon release of the treadle, the press 19 is raised and the plunger 25 is retracted, the various parts being now in position for the next cycle of operations for filling a new container.

The hopper structure permits the operator to quickly introduce a measured amount of meat and the remaining operations automatically cause the shaped meat to be introduced into the container. The operations are rapid and enable a single operator to fill a large number of containers within a modicum of time.

Instead of employing compressed air, it will be understood that vacuum may be employed or any other pressure fluid used. In fact, the power may be supplied in any form for effecting the movements desired.

While in the foregoing description, I have set forth certain details and certain steps in a specific sequence, it will be understood that considerable variation may be made in all of them by those skilled in the art without departing from the spirit of my invention.

I claim:

1. Apparatus for packing a comminuted meat product and the like into a container, comprising a chamber, means for laterally compressing the product within the chamber into a shape conforming in cross section to the interior of the container, a discharge tube of a cross section shape substantially the same as the interior of the container communicating with said chamber in alignment therewith, said discharge tube providing means for slidably supporting the container in telescopic relation therewith with the open end of the container received about the discharge tube and the closed end of the container being immediately adjacent the end of the discharge tube, means for exerting longitudinal pressure against one end of the shaped product to cause the same to move in a longitudinal direction through the chamber and discharge tube and into the container while the chamber and tube maintain the product under lateral compression, means for exerting yielding pressure against the end of the container opposing movement of the product whereby the product is tightly packed in the container and the container is slightly moved from the discharge tube as the product is filled therein, and means for moving the substantially filled container in the direction of movement of the product to withdraw the container from the end of the discharge tube.

2. Apparatus for packing a comminuted meat product and the like into a container, comprising a chamber, a press head having a bottom providing with an opposing wall of said chamber a stuffing channel of substantially the same polygonal cross section shape as the interior of the container, the press head being movable toward said chamber wall to laterally compress the product in said channel, a discharge tube of

a polygonal cross section shape substantially the same as the interior of the container communicating with said chamber in alignment therewith, said discharge tube providing means for slidably supporting a container of polygonal cross section in telescopic relation therewith with the open end of the container received about the discharge tube, the closed end of the container immediately adjacent the end of the discharge tube and the walls of the container in alignment with the walls of the discharge tube, a plunger movable in said channel and said discharge tube for exerting pressure against one end of the shaped product to cause the same to move through the channel and discharge tube and into the container while the channel and discharge tube maintain the product under lateral compression, means for exerting yielding pressure against the end of the container opposing movement of the product whereby the product is tightly packed in the container and the container is moved along the discharge tube against said yielding pressure as the container is filled, and means operative when the container is substantially filled for moving the filled container in the direction of movement of the product to withdraw the container from the end of the discharge tube.

3. Apparatus for packing a comminuted meat product and the like into a container, comprising a chamber, a press head having a bottom providing with an opposing wall of said chamber a stuffing channel of substantially the same polygonal cross section shape as the interior of the container, the press head being movable toward said chamber wall to laterally compress the product in said channel, a discharge tube of a polygonal cross section shape substantially the same as the interior of the container communicating with said chamber in alignment therewith, said discharge tube providing means for slidably supporting a container of polygonal cross section in telescopic relation therewith with the open end of the container received about the discharge tube, the closed end of the container immediately adjacent the end of the discharge tube and the walls of the container in alignment with the walls of the discharge tube, a plunger movable in said channel and said discharge tube for exerting pressure against one end of the shaped product to cause the same to move through the channel and discharge tube and into the container while the channel and discharge tube maintain the product under lateral compression, means for exerting yielding pressure against the end of the container opposing movement of the product whereby the product is tightly packed in the container and the container is moved along the discharge tube against said yielding pressure as the container is filled, means operative when the container is substantially filled for moving the filled container in the direction of movement of the product to withdraw the container from the end of the discharge tube, and single means for successively actuating said press head, said plunger and said means for withdrawing the container.

4. Apparatus for packing a comminuted meat product and the like into a container, comprising a casing providing a stuffing chamber having a generally V-shaped bottom, a press head having its bottom portion in the shape generally of an

inverted V and forming with the bottom of the chamber a substantially rectangular channel, a discharge tube communicating with said chamber and forming a rectangular continuation of said channel, said tube providing means for slidably supporting a container in telescopic relation therewith with the open end of the container received about the discharge tube and the closed end of the container disposed immediately adjacent the end of the discharge tube, said channel and said tube being of substantially the same cross section shape as the interior of the container, means for reciprocating said press head to laterally compress the product within said channel, a plunger in said channel for engaging the end of the compressed product therein, means for reciprocating the plunger to move the compressed product longitudinally through the channel and the discharge tube communicating therewith and into the container, the container being moved along the discharge tube as the product is filled therein, means for exerting the yielding pressure on the end of the container opposing the movement of said product whereby the product is tightly packed within the container, and means for moving the container in the direction of movement of the product to withdraw the container from the discharge tube when the container is substantially filled.

5. Apparatus for packing a comminuted meat product and the like into a container, comprising a casing providing a stuffing chamber having a generally V-shaped bottom, a press head having its bottom portion in the shape generally of an inverted V and forming with the bottom of the chamber a substantially rectangular channel, a discharge tube communicating with said chamber and forming a rectangular continuation of said channel, said tube providing means for slidably supporting a container in telescopic relation therewith with the open end of the container received about the discharge tube and the closed end of the container disposed immediately adjacent the end of the discharge tube, said channel and said tube being of substantially the same cross section shape as the interior of the container, means for reciprocating said press head to laterally compress the product within said channel, a plunger in said channel for engaging the end of the compressed product therein, means for reciprocating the plunger to move the compressed product longitudinally through the channel and the discharge tube communicating therewith and into the container, the container being moved along the discharge tube as the product is filled therein, means for exerting the yielding pressure on the end of the container opposing the movement of said product whereby the product is tightly packed within the container, means for moving the container in the direction of movement of the product to withdraw the container from the discharge tube when the container is substantially filled, and single means for successively actuating said press head, said plunger and said means for withdrawing the container, the plunger being actuated after the completion of the stroke of the press head and the withdrawing means being actuated after the completion of the stroke of the plunger.

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