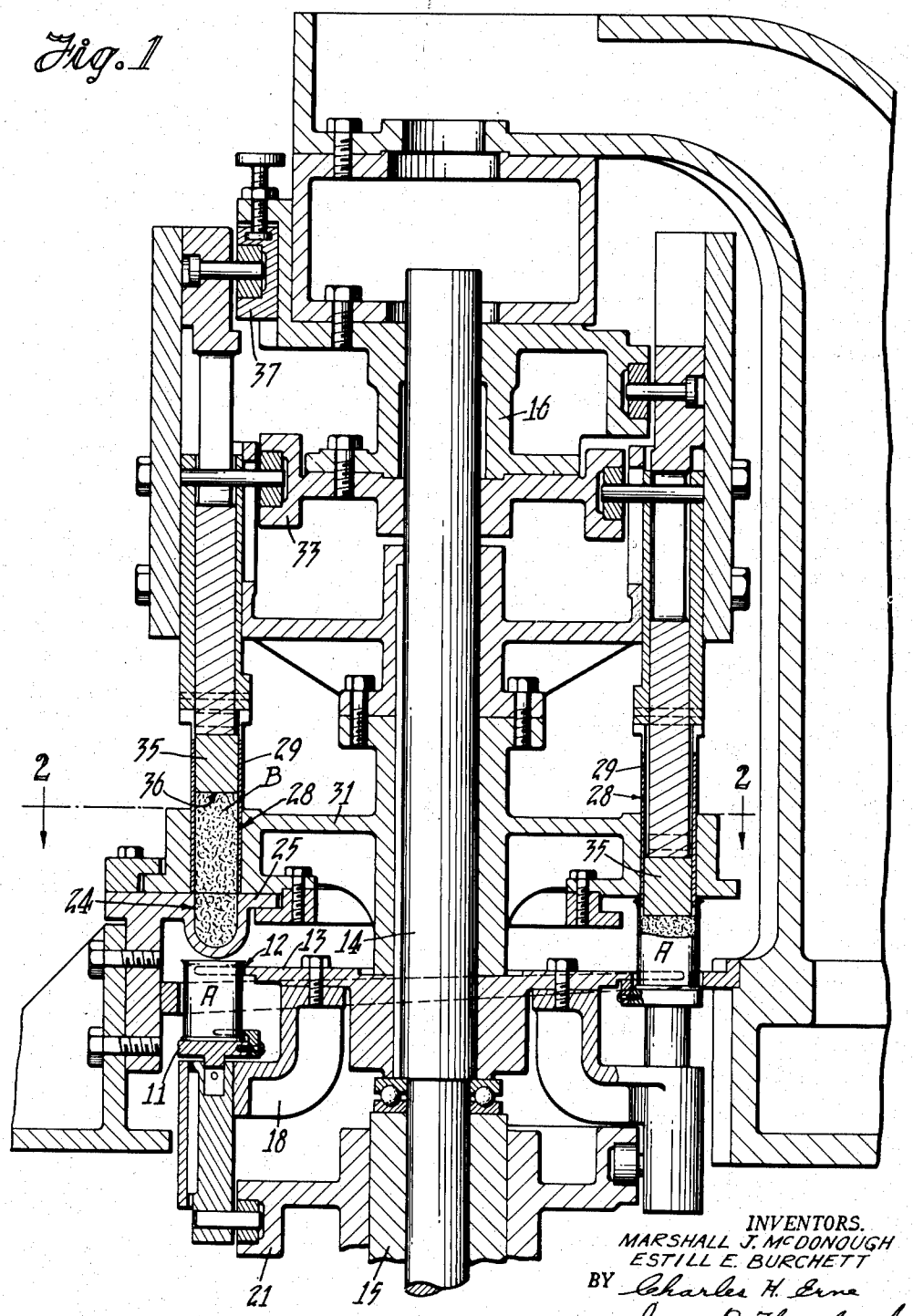
Oct. 27, 1953 M. J. McDONOUGH ET AL 2,656,966

CAN FILLING MACHINE HAVING RECIPROCATING PRODUCT CONTACTING PLUNGER AND MOISTURE PROJECTING DEVICE THEREFOR

Filed March 13, 1950 4 Sheets-Sheet 1

Fig. 1



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Filed March 13, 1950 4 Sheets-Sheet 2

Fig. 2

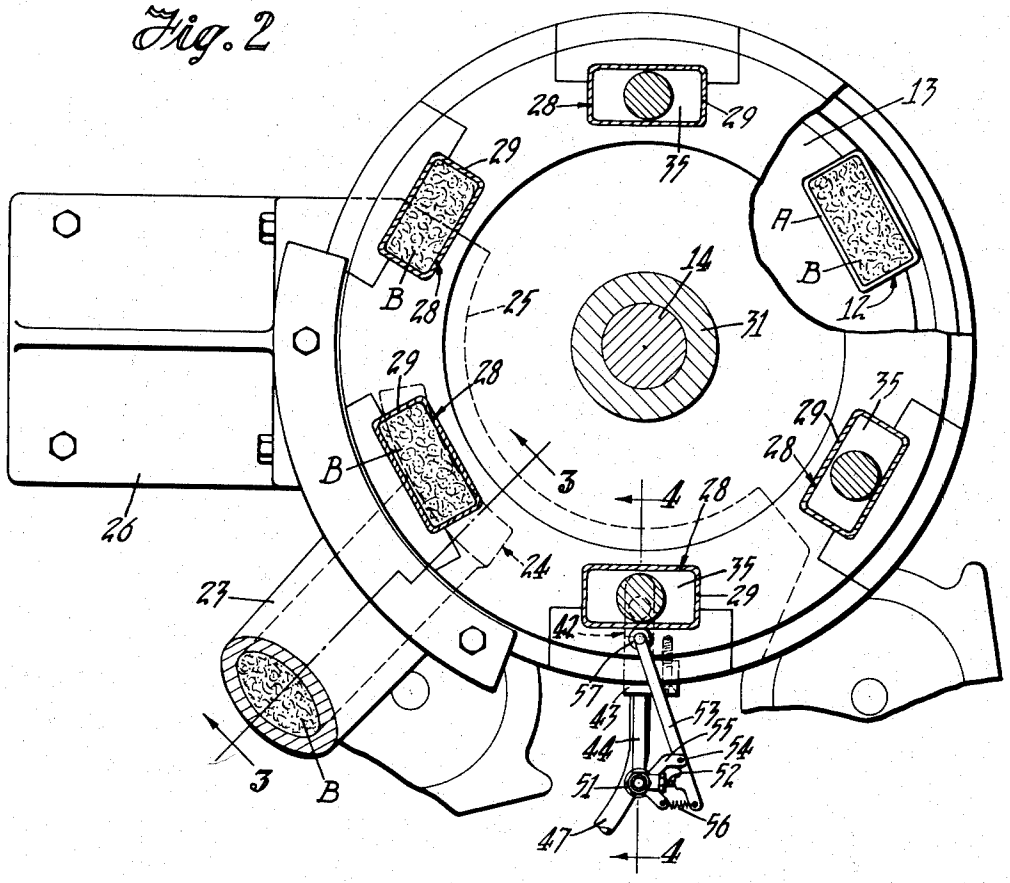


Fig. 3

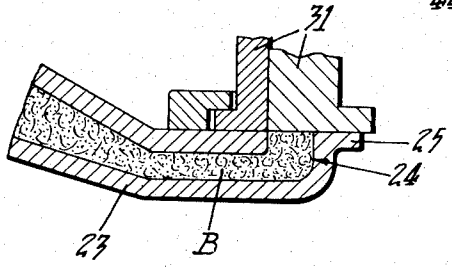
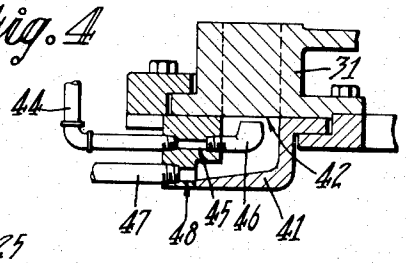


Fig. 4



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Fig. 7

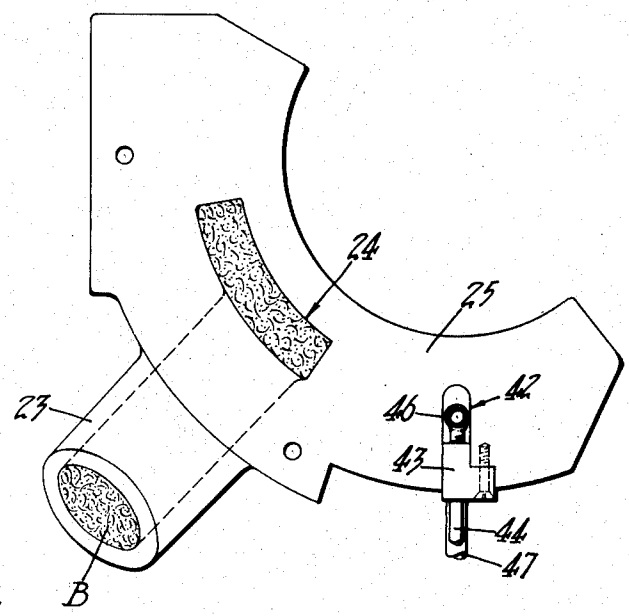


Fig. 8

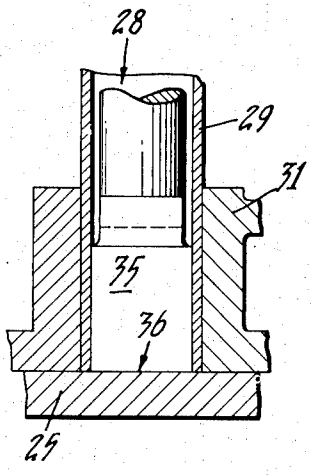


Fig. 5

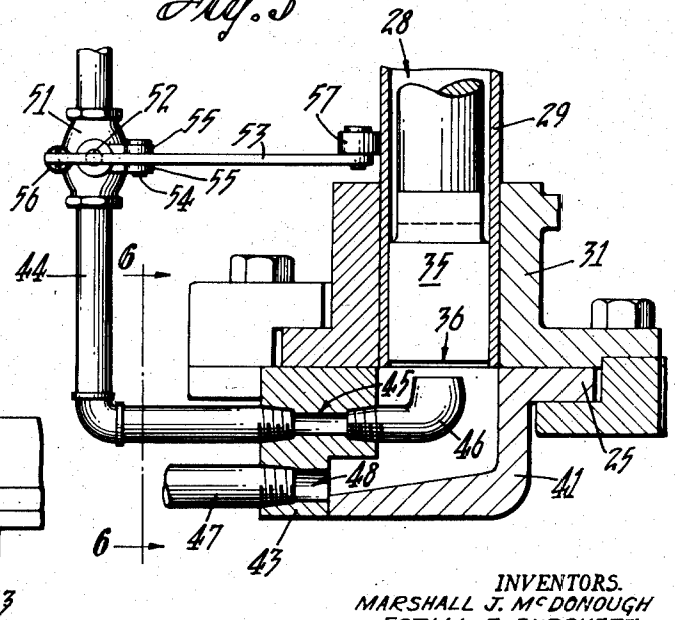
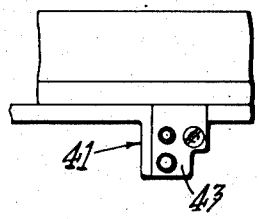


Fig. 6



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Filed March 13, 1950 4 Sheets-Sheet 4

Fig. 9

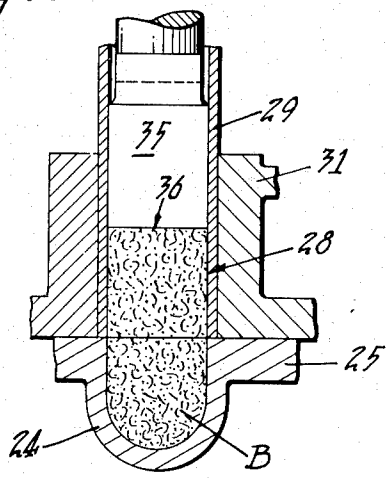


Fig. 10

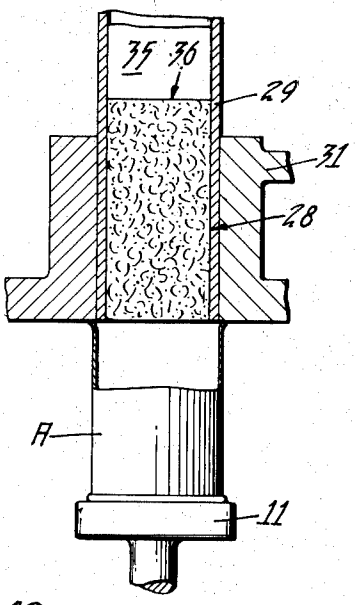


Fig. 11

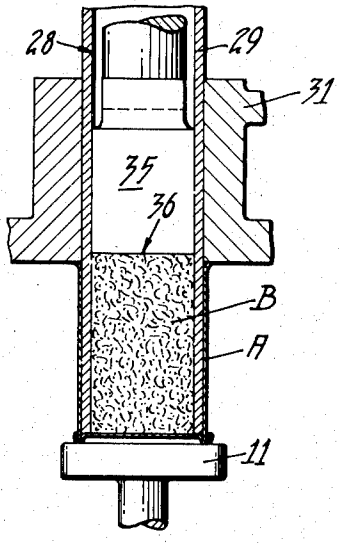


Fig. 12

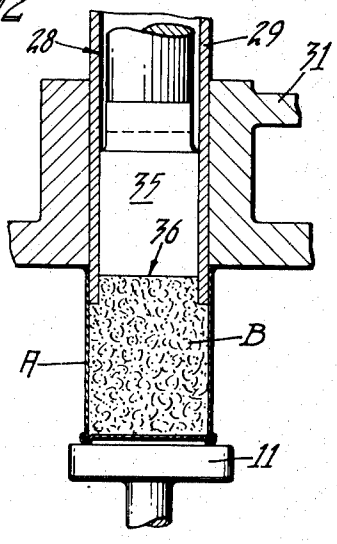
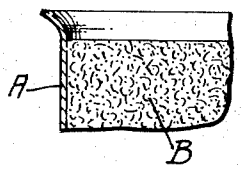


Fig. 13



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UNITED STATES PATENT OFFICE

2,656,966

CAN FILLING MACHINE HAVING RECIPROCATING PRODUCT CONTACTING PLUNGER AND MOISTURE PROJECTING DEVICE THEREFOR

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Application March 13, 1950, Serial No. 149,382

5 Claims. (Cl. 226—97)

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The present invention relates to machines for canning meat products and the like in which the product is forced into containers or cans by a presser or plunger element and has particular reference to devices for moistening the product contacting surface of the presser element to protect this surface against the adherence of the product thereto. This is an improvement upon the Can Filling Machine disclosed in United States Patent No. 2,336,415 issued December 7, 1943, to R. E. J. Nordquist et al.

In the packing of meat products into cans it is important that the product fill the can solidly so that all air is excluded from the can to protect the product against spoilage. It is further important that the top of the product in the can be left smooth and even at a predetermined level below the top of the can to allow for proper vacuumizing and application of the cover to the can. Any of the product that extends above this level, especially adjacent the edges of the can is liable to get caught in the seam which unites the cover to the can and thus cause a defective seam which may result in subsequent spoilage of the product.

In machines of the type that utilizes plungers to pack and press the meat product tightly into cans, the product frequently clings to the product contacting face of the plunger when the plunger is withdrawn from the can, after the packing operation, and thus the adhering product is lifted sufficiently to disrupt the solid condition of the pack and sometimes sufficiently to cause adherence to the can flange causing improper closing of the can.

The instant invention contemplates overcoming these difficulties by the provision of devices for moistening or otherwise conditioning the contacting face of the plunger to protect it against adherence of the product thereto.

An object of the invention is the provision in a product packing or filling machine of devices which operate to project steam or other suitable fluids against the product contacting faces of the pressure plungers to moisten or otherwise condition and thereby protect these faces against adherence of the product thereto during the product pressing or packing operation.

Another object is the provision of such devices wherein the use of steam or other suitable fluids provides a sanitary and sterilizing medium suitable for use in connection with food products while at the same time serving as a moistening agent to overcome adhesion of the product to the packing elements.

A further object is the provision in such a

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machine of valve devices which are operable in time with the advancement of the pressure plungers for insuring the projection of the steam against the faces of the plungers only when a plunger moves into position to receive the steam

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a vertical sectional view of a can filling machine embodying the instant invention, with parts broken away;

Fig. 2 is a top plan sectional view taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a sectional detail taken substantially along the broken line 3—3 in Fig. 2, with parts broken away;

Fig. 4 is a sectional detail taken substantially along the line 4—4 in Fig. 2, with certain of the movable parts in a different position, and with parts broken away;

Fig. 5 is an enlarged view similar to Fig. 4 showing certain of the movable parts in a different position;

Fig. 6 is a detail view taken substantially along a vertical plane indicated by the line 6—6 in Fig. 5, with parts broken away;

Fig. 7 is a plan view of one of the parts shown in Fig. 2;

Figs. 8 to 12 inclusive, are enlarged schematic sectional views of the can filling parts of the machine illustrating the parts in different positions incident to filling the product into a can; and

Fig. 13 is a sectional view of the upper corner of a filled can.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate principal parts of the meat product packing machine disclosed in the above mentioned Nordquist Patent 2,336,415. In such a machine, the meat product is fed into a filling and measuring sleeve which upon being filled, is inserted into an empty can. A plunger located within the sleeve presses or compacts the product into a solid mass in the can as the sleeve is withdrawn from the can. After full withdrawal of the sleeve, the plunger is withdrawn, thus leaving the product in the can. It is upon this withdrawal of the plunger that the sticky product clings to the plunger and it is to the overcoming of this difficulty that

the instant invention is directed, the remedy lying in the effective steaming or otherwise fluid treating of the product contacting face of the plunger immediately prior to the product pressing or compacting operation.

Cans A (Figs. 1, 10, 11, 12, 13) to be filled with the meat product preferably are fed into the machine and are discharged, after filling, from the machine in any suitable manner such as is disclosed in the above mentioned Nordquist patent. The cans are received on vertically movable lifter pads 11 (Fig. 1) which are vertically aligned with can holding pockets 12 of a rotatable turret 13 keyed to a continuously rotating shaft 14, journaled in suitable bearings 15, 16 formed in the main frame of the machine and parts secured thereto. The shaft is rotated in any suitable manner.

The lifter pads 11 are mounted in brackets 18 which are secured to the turret 13, and therefore rotate with the turret, carrying the cans along a curved path of travel. Vertical movement of the lifter pads is effected, as disclosed in the Nordquist patent, by a stationary cam 21 which is secured to the shaft bearing 15. The lifter pads operate to lift a can A into filling position to receive a charge of the meat product as will be hereinafter explained.

The meat product, marked B in the drawings, is fed under pressure into the machine, as shown in the Nordquist patent, by way of a conduit 23 (Figs. 2 and 3) which merges into an elongated arcuate trough 24 formed in a flat top table 25 bolted to a bracket 26 secured to the main frame of the machine. The trough 24 and the table 25 preferably are located immediately above the curved path of travel of the cans A.

Measured charges of the meat product B are picked up from the trough 24, as shown in the Nordquist patent, by measuring chambers 28 (Figs. 1, 2 and 9) enclosed by open end vertically disposed sleeves 29 arranged in vertical alignment with the lifter pads 11 and supported in a rotatable disc member 31 keyed to and rotating with the shaft 14. The bottom of the disc member 31 engages against and slides on the table 25. The sleeves 29 are lowered and raised to insert the charge of meat product into the cans, as in the Nordquist patent, by way of a stationary cam 33 which surrounds the shaft 14 above the disc member 31 and which is secured to stationary members fixed to the machine frame.

Each sleeve 29, is provided in its upper end, with a plunger 35 having preferably a substantially flat lower product contacting face 36 for removing the measured charge of meat product from the sleeves. The plungers 35 are movable within the sleeves 29, as in the Nordquist patent, through a stationary cam 37 which surrounds the shaft 14 above the cam 33 and which is secured to the cam 33 and to stationary members fixed to the machine frame.

As hereinbefore mentioned, provision is made for steaming the product contacting faces 36 of the plungers 35 prior to engagement of these faces with the meat product, to protect these faces against adherence of the product to them. For this purpose the arcuate flat top table 25 preferably is formed with a steam ejector which includes steam box 41 (Figs. 4 and 5) located adjacent the forward end of the trough 24, i. e. the end of the trough that the sleeves 29 approach to receive their charge of product, at the right as viewed in Figs. 2 and 7. The top of the table 25 is formed with an outlet opening 42 (Figs. 2 and 7) which communicates with the interior of this steam box. The front of the steam box is closed with a plate 43.

Steam under pressure is introduced into the steam box 41 preferably through a supply pipe 44 which leads from any suitable source of steam under pressure. The machine end of the supply pipe is threadedly connected into the plate 43 and communicates with a channel 45 formed in the plate. Inside the steam box 41 a nozzle 46 is threadedly secured in the plate 43 in communication with the channel 45. The nozzle extends into alignment with the outlet opening 42 of the steam box. A drain pipe 47 threadedly secured in the plate 42 and in communication with a channel 48 in the plate 43 provides for drainage of condensate from the box. If desired the nozzle 46 may be dispensed with and the steam projected directly into the steam box through the inlet channel 45 for escape through the outlet opening 42 in the box.

Steam is projected periodically from the nozzle 46 under the control of a normally closed valve 51 (Figs. 2 and 5) operated in time with the advancement of the pressure plungers 35 so as to project the steam against the faces 36 of the plungers. The valve is open only when the plungers are passing over the nozzle. Hence only the faces of the plungers are moistened and the bottom of the rotatable disc member 31 between the plungers is kept dry.

The valve 51 is connected into the steam supply line or pipe 44 as best shown in Figs. 2 and 5. This is a whistle type valve having a movable valve pin 52 which opens and closes the valve. Actuation of the valve pin 52 preferably is effected by a lever 53 which is mounted on a pivot pin 54 carried in lugs 55 formed on the valve. The outer end of the lever engages against the valve pin and is held in place by a tension spring 56 stretched between the valve and the lever. The inner end of the lever 53 carries a roller 57 which is disposed in the circular path of travel of the plunger sleeves 29 as they move with the rotatable disc member 31.

Hence as a sleeve 29 moves into position adjacent the valve 51, the roller 57 engages the sleeve and is forced outwardly. This rocks the lever 53 and thus opens the valve 51, permitting steam to flow from the nozzle 46 through the outlet opening 42 in the table 25. This projection of the steam from the nozzle is timed, by the location of the lever roller 57, so that steam flows only while a plunger 35 is passing over the outlet opening 42. Hence it is only the face of the plunger that receives the steam.

In the operation of the machine, the rotating shaft 14 carries the lifter pads 11 and their vertically aligned sleeves 29 through a curved path of travel for the various operations of filling a can A and for discharging it after filling. As a measuring sleeve 29 approaches the arcuate table 25 during this rotation of the shaft 14, the cams 33, 37 operate to lower the sleeve 29 and its plunger 35 to a position where the bottom edge of the sleeve and the product contacting face 36 of the plunger are flush with the top of the table 25, as best shown in Fig. 8. In this position the sleeve 29 and the plunger face 35 engage the leading edge of the table which acts as a scraper against these faces and removes any foreign matter which may adhere to them.

As the sleeve 29 and plunger face 36 slide along the top of the table 25, they pass over the outlet opening 42 of the steam box 41 in the table as

shown in Figs. 2 and 5. It is at this time that the valve 51 is opened and thus permits steam from the nozzle 46 in the steam box to impinge against the face 36 of the plunger. A certain amount of this impinging steam condenses on the plunger face 36 and forms a film of moisture thereon.

As the shaft 14 continues to rotate, it slides the lowered sleeve 29 and its plunger 35 across the table 25 into alignment with the trough 24 in the table. While the sleeve is sliding along this trough 24, the meat product under pressure is forced up into the sleeve as shown in Fig. 9, and the cam 37 lifts the plunger to its uppermost position in the sleeve where the moistened bottom face 36 of the plunger acts as a stop to define the capacity of the measuring chamber within the sleeve and to thus determine the volumetric measurement of the charge permitted to enter the chamber. The measuring chamber is filled by the time the sleeve reaches the far end of the trough 24 and the edge of the trough thereby cuts off the product as the sleeve continues to slide along the table.

With the measured charge of meat product housed within the sleeve 29, the sleeve rides off the table 25, and the lifter pad 11 immediately raises a can A into position under the sleeve as shown in Fig. 10. The sleeve and the plunger then move down in unison, under the action of their cams 33, 37, into the waiting can as shown in Fig. 11. With the charge of meat product thus inserted in the can, the sleeve 29 is withdrawn while the plunger 35 is slightly and slowly depressed as shown in Fig. 12. This action of the sleeve and the plunger compresses the product into a solid mass and forces it into engagement with the walls of the can. The plunger 35 is then withdrawn.

It is at this stage of the filling operation that the moistened face 36 of the plunger 35 exerts itself. The moisture on the face 36 of the plunger protects this face against the adherence of the sticky product thereto. Thus the plunger face 36 raises freely from the product and leaves the top surface of the product smooth and even as shown in Fig. 13. There is thus nothing clinging to the face of the plunger to effect an unsanitary condition in the machine and likewise the product in the can is properly placed so that a cover may be readily applied thereto in the usual manner.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. In a machine for packing meat or other sticky materials into containers, the combination of a table having an opening for discharging a product under pressure, a rotatable disc having sliding engagement with a surface of said table, a sleeve carried in said disc and enclosing a product measuring chamber having an opening normally closed by said table surface and alignable with said table opening for receiving a charge of the product therefrom, a plunger disposed in said chamber, said plunger having a product contacting face for pressing the charge of the product into a container aligned with said chamber

opening, a steam box formed in said table and having an opening in the top of said table adjacent and preceding said product opening, said table opening being smaller in area than said product contacting face of the plunger and its chamber opening, ejector means for projecting steam through said steam box opening in the table, and control means operable while said plunger face passes over said steam box opening for actuating said ejector means to project steam against only the product contacting face of said plunger prior to engagement of said face with the product to moisten and protect said face against adherence of the product thereto during the product pressing operation and to prevent moistening the slideably engaged surfaces of said disc and table.

2. In a machine for packing meat products or other sticky materials into containers, the combination of a table having an opening for discharging a product under pressure, a rotatable disc having sliding engagement with a surface of said table, a sleeve carried in said disc and enclosing a product measuring chamber having an opening normally closed by said table surface and alignable with said table opening for receiving a charge of the product therefrom, a plunger disposed in said chamber, said plunger having a product contacting face for pressing the charge of the product into a container aligned with said chamber, a steam box formed in said table and having an opening in the top of said table smaller in area than said product contacting surface of the plunger and its chamber opening closely adjacent and preceding said product opening, means for projecting steam from said steam box and against the product contacting face of said plunger only while said plunger face passes over said steam box opening in the table prior to engagement of said face with the product to moisten and protect said face against adherence of the product thereto during the product pressing operation, means for introducing steam into said steam box, and a drain communicating with said steam box for draining condensate from said box and to prevent deleterious moistening of the slideably engaged surface of said disc and table.

3. In a machine for packing meat products or other sticky materials into containers, the combination of a table having an opening for discharging a product under pressure, a rotatable disc having sliding engagement with a surface of said table, a sleeve carried in said disc and enclosing a product measuring chamber having an opening normally closed by said table surface and alignable with said table opening for receiving a charge of the product therefrom, a plunger disposed in said chamber, said plunger having a product contacting face for pressing the charge of the product into a container aligned with said chamber, a steam box formed in said table and having an opening in the top of said table smaller in area than said product contacting surface of the plunger and its chamber opening closely adjacent and preceding said product opening, a nozzle disposed in said steam box for projecting steam through said table opening, and steam control means operable only while the product contacting face of said plunger passes over said steam box opening in the table to project steam from said nozzle against said plunger face immediately prior to engagement of said face with the product to moisten and protect said face against adherence of the prod-

uct thereto during the product pressing operation and to prevent deleterious moistening of the slideably engaged surfaces of said disc and table.

4. In a machine for packing meat or other sticky materials into containers, the combination of a table having an opening for discharging a product under pressure, a rotatable disc having sliding engagement with a surface of said table, a plurality of sleeves carried in said disc and enclosing product measuring chambers, each having an opening normally closed by said table surface and alignable with said table opening for receiving charges of the product therefrom, a plunger disposed in each of said chambers, each of said plungers having a product contacting face for pressing the charges of the product into containers aligned with said chambers, a stationary steam ejector having a small orifice in said table adjacent the path of travel of said plungers, a control valve connecting with said steam ejector, and means engageable with said sleeves for opening and closing said valve in time with the advancement of said plungers adjacent said ejector for projecting steam against only the product contacting face of each of said plungers prior to engagement of said face with the product to moisten and protect said face against adherence of the product thereto during the product pressing operation and to prevent deleterious moistening of the slideably engaged surfaces of said disc and table.

5. In a machine for packing meat or other sticky products into a container, the combination of a table having a flat surface, a conveyor having a flat surface moving over said table surface in sliding contact therewith, a tubular chamber formed in said conveyor and open at said conveyor surface, a reciprocating product packing plunger in said chamber, a small moisture projecting orifice in said table surface, means for projecting moisture from said orifice against the product contacting face of the plunger, and valve means for stopping said projection of moisture while said flat surface of the conveyor passes over said orifice and to release the moisture for projection only while said plunger face passes over the orifice, thus preventing deleterious moistening of said flat conveyor surface and moistening said plunger face to prevent adherence of the sticky product thereto during a subsequent packing operation.

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