July 9, 1940. E. G. BAUER 2,206,935

FILLING MACHINE

Filed Sept. 24, 1937 2 Sheets-Sheet 1

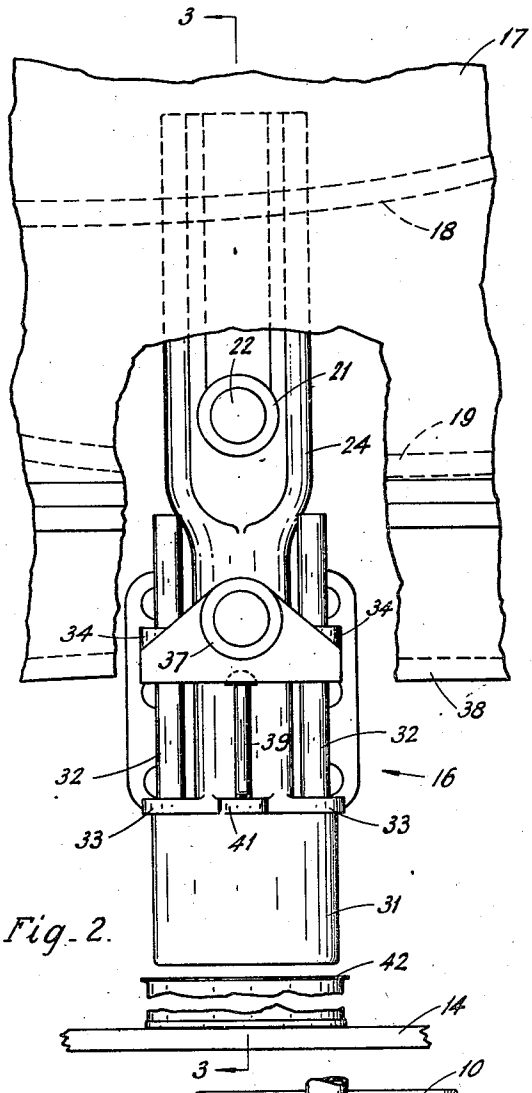

Fig. 2.

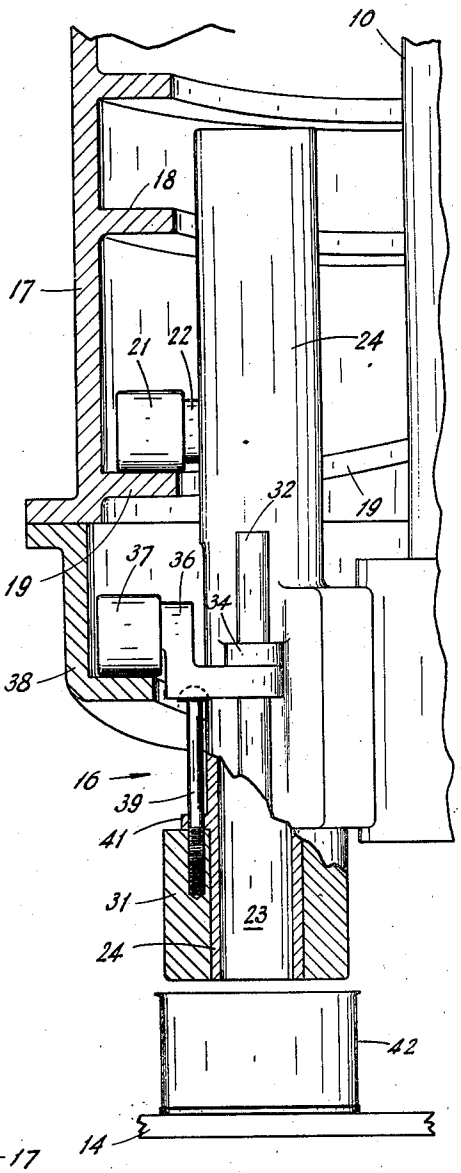

Fig. 3.

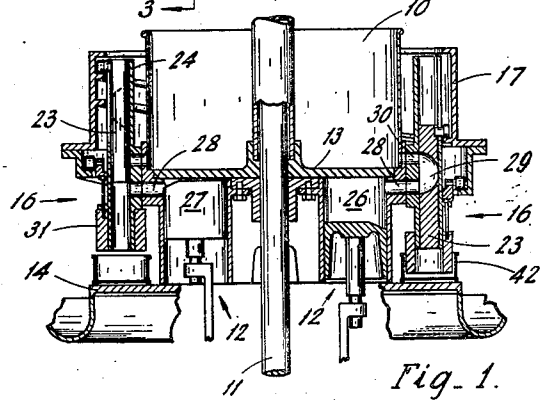

Fig. 1.

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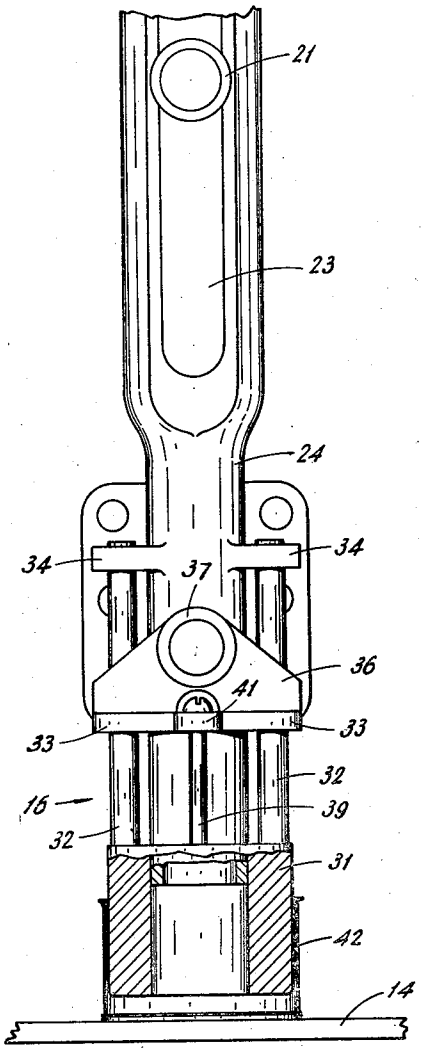

Fig. 4.

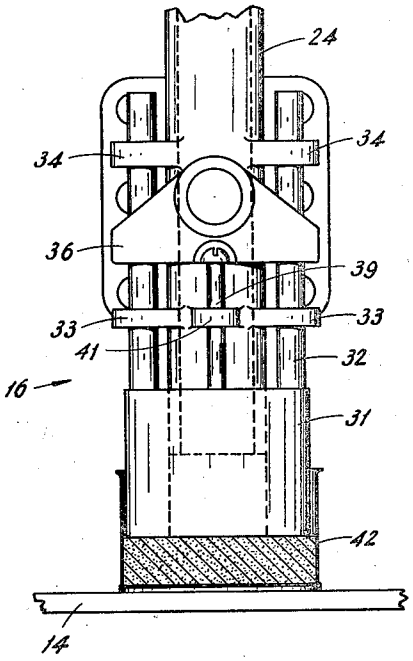

Fig. 5.

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UNITED STATES PATENT OFFICE

2,206,935

FILLING MACHINE

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Application September 24, 1937, Serial No. 165,558

11 Claims. (Cl. 226—129)

This invention relates to filling machines of a character adapted for use with semi-solid materials, and is concerned more particularly with the provision of an improved machine which will fill such materials as potted meat, sausage, and the like, into the can efficiently.

It is a general object of the invention to provide an improved filling machine of the character referred to which operates to fill the cans completely and to avoid the presence of air pockets in the material.

Another object of the invention is to provide a machine of the character referred to having improved filling means which guides and directs the flow of material into the can from the bottom upwardly.

Another object of the invention is to provide a machine of the character referred to having filling means which operates to pack the material into the can.

Other objects of the invention will appear from the following description of a preferred embodiment thereof as disclosed in the accompanying drawings, in which:

Fig. 1 is a fragmentary vertical section through a filling machine embodying my invention, the section being taken through the vertical axis of the machine.

Fig. 2 is an enlarged elevational view of a filling valve and a portion of the cam control means therefor.

Fig. 3 is a sectional elevation of a filling valve and the cam control means therefor, the sectional part of the view being taken in the plane of the line 3—3 in Fig. 2.

Fig. 4 is a fragmentary elevational view, partly in section, of a filling valve showing its position in operative relation with a can at the beginning of a filling operation.

Fig. 5 is a view similar to Fig. 4 showing the valve as positioned at a later time during the filling operation.

The type of filling machine with which the instant invention is preferably employed is disclosed, for example, in the patent to Martin et al., 1,506,851, dated September 2, 1924. Only so much of the machine as is believed necessary or desirable for an understanding of the instant invention will be described, and for a complete disclosure of other parts of the machine, reference is made to the above patent.

Generally, the machine comprises a rotatable tank 10 (Figs. 1 and 2) which is suitably journalled about a supporting post 11, a series of pump devices 12 disposed beneath the stationary bottom wall or cut-off plate 13 of the tank, and a can table 14 which is rotatable with the tank, and a series of filling valves 16 associated with the pump devices 12. The open and closed condition of the valves is controlled by a cylindrical cam plate 17 having respective upper and lower cam tracks 18 and 19 formed on the inner face thereof for cooperation with a roller 21 mounted on a projecting arm 22 of the valve plunger 23 which is guided by the engagement of the arm 22 in a vertical slot in the valve casing 24.

The cutoff plate 13 of the tank is cutaway for a portion of its area to permit the discharge of material into the cylinder 26 of a pump when the piston 27 thereof is in retracted position as determined by the controlling cam therefor. Subsequently, as the pumps and valves rotate, a filled pump cylinder 26 is cut off from the tank by the plate 13, and its piston 27 rises to discharge the material through an associated passage 28 communicating with the valve casing 24 and into a can or back into the tank. As explained in said patent, if no can is fed into operative relation with a valve, the valve plunger 23 has its roller 21 operatively engaged with lower cam track 19 whereby the plunger is positioned as at the right of Fig. 1 so that plunger passage 29 establishes communication from the passage 28 to a passage 30 leading into the tank. If a can has been fed into operative relation with a valve, the valve plunger 23 is raised by the engagement of its roller 21 with the upper cam track 18 so that the material can be discharged from passage 28 through casing 24 of the valve into the associated can.

The above described structure is conventional and forms no part of the instant invention, except in so far as it may cooperate with the novel mechanism hereinafter described.

In order to provide for filling of the can from the bottom upwardly, and for packing of the material while it is being filled to eliminate air pockets, a movable plunger or packing means is operatively associated with each valve to control and guide the filling of the material from the valve into the can. The plunger 31 (Figs. 2 and 3) is mounted for vertical sliding movement on the valve casing 24 by means of a pair of guide rods 32 secured therein and extending upwardly through apertured guides 33 and 34 of the valve casing 24. The rods 32 are connected at their upper ends by a bracket 36 carrying a roller 37 which may be operatively engaged with a segmental cam track 38 secured at the bottom of the cam plate 17.

In order to limit the movement of the plunger 31 with respect to the valve, the plunger 31 is provided with a headed stud 39 which projects upwardly through an apertured ear 41 of the valve casing, which forms a stop for engagement by the head of the stud 39 in the lowered position of the plunger, as shown in Fig. 4. In the upper position of the plunger 31, shown in Figs. 2 and 3, its lower surface is substantially flush with the end of the casing 24 and valve plunger

23, while in its lowered position as shown in Fig. 4, the bottom surface of the plunger 31 is closely adjacent the bottom wall of the can 42 which is being filled. In such lowered position, the upper end of the plunger remains in overlapping relation with the lower end of the casing 24 and its outer wall is in close cooperative relation with the wall of the can 42.

In operation, the pump piston 27 forces the semi-solid material outwardly and down through the casing 24 and the packing plunger 31 so that the material is forced out beneath the packing plunger and is spread throughout the cross sectional area of the can, being packed thoroughly by the weight of the packing plunger which has floating engagement therewith. The force of the incoming material is sufficient to lift the packing plunger 31 as the material is forced therebeneath, the lifting of the plunger being illustrated by the position shown in Fig. 4 as compared with that shown in Fig. 5. This operation continues until the can is filled, when the roller 37 will engage the cam track 38 and lift the packing plunger to the position shown in Figs. 2 and 3, at the same time that the valve plunger 23 descends to eject all of the material from the casing 24. As a result, the material is deposited into the can as a solid mass and without air pockets so that it will keep in good condition after the can is closed. In the event no material is discharged through a valve, cam track 38 will engage and lift the packing plunger out of the empty can.

While I have shown and described a preferred form of the invention, it will be understood that the invention is capable of both variation and modification, so that its scope should be limited only by the scope of the claims appended hereto.

I claim:

1. In a filling machine for handling semi-solid materials, a filling valve for conducting material from a source of supply to a can, and a packing plunger having an unrestricted discharge passage therethrough and a free sliding connection with said valve for movement into a can in free floating engagement with material flowing from said valve into the can.

2. In a filling machine for handling semi-solid materials, a filling valve, means for forcing material through said valve into a can, and weight means having an unrestricted discharge passage therethrough and associated with said valve for free movement relative thereto to rest on material deposited in the can, whereby to insure complete filling of the can.

3. In a filling machine for handling semi-solid materials, a filling valve, means for forcing material through said valve into a can, weight means having an unrestricted discharge passage therethrough and associated with said valve for free sliding movement thereto to rest on material deposited in the can, whereby to insure complete filling of the can, and means for withdrawing said weight means at the end of the filling operation.

4. In a filling machine for handling semi-solid materials, a filling valve, means for forcing material through said valve into a can, and a packing weight having an unrestricted discharge passage therethrough and mounted for free sliding movement on said valve for engagement with material deposited in the can.

5. In a filling machine for handling semi-solid materials, a filling valve, means for forcing material through said valve into a can, a packing weight slidably mounted on said valve for engagement with material deposited in the can, and cam means for raising said packing weight at the end of the filling operation.

6. In a filling machine for handling semi-solid material, a rotatable tank, a filling valve mounted on said tank comprising a vertically disposed casing and a valve plunger operatively mounted in said casing, cam means mounted about said tank for controlling the movement of said plunger, a packing plunger slidably mounted on said casing for engagement with material discharged from said casing into a can, and a cam for controlling said packing plunger in timed relation to the operation of said valve plunger.

7. In a filling machine for handling semi-solid material, a rotatable tank, a filling valve mounted on said tank comprising a vertically disposed casing and a valve plunger operatively mounted in said casing, cam means mounted about said tank for controlling the movement of said plunger, a packing plunger slidably mounted on said casing for free floating engagement with material discharged from said casing into a can, and a cam for withdrawing said packing plunger after the operation of said valve plunger to discharge material into a can is completed.

8. In a filling machine for handling semi-solid material, a rotatable tank, a filling valve mounted on said tank comprising a vertically disposed casing and a valve plunger operatively mounted in said casing, cam means mounted about said tank for controlling the movement of said plunger, a packing plunger slidably mounted on said casing for free floating engagement with material discharged from said casing into a can, and stop means associated with said casing and said packing plunger for limiting the downward movement of said packing plunger.

9. In a filling machine for handling semi-solid material, a rotatable tank, a filling valve mounted for rotative movement with said tank comprising a cylindrical casing, a valve plunger operatively mounted in said casing, cam means mounted adjacent said tank for controlling reciprocation of said plunger, guide means on said casing, a cylindrical weight slidably disposed about said casing for operative packing engagement with material discharged from said valve into a can, guide rods on said weight slidably engaged with said guide means, a cam track mounted adjacent said tank, and a cam follower mounted on said guide rods for engagement with said cam track.

10. In a filling machine for handling semi-solid material, a rotatable tank, a filling valve mounted on said tank comprising a vertically disposed cylindrical casing and a valve plunger operatively mounted in said casing, guide means on said casing, a cylindrical weight slidably disposed about said casing for operative packing engagement with material discharged from said casing into a can, and means on said weight operatively engaged with said guide means.

11. In a filling machine for handling semi-solid material, a rotatable tank, a filling valve mounted on said tank comprising a vertically disposed cylindrical casing and a valve plunger operatively mounted in said casing, apertured guides on said casing, a cylindrical weight slidably disposed about said casing for operative packing engagement with material discharged from said casing into a can, guide rods on said weight operatively engaged with said guides, and means associated with said casing and said weight for limiting relative movement therebetween.

EDWARD G. BAUER.