Dec. 5, 1933. R. B. BAGBY 1,937,803

FILLING MACHINE

Filed July 20, 1931 2 Sheets-Sheet 1

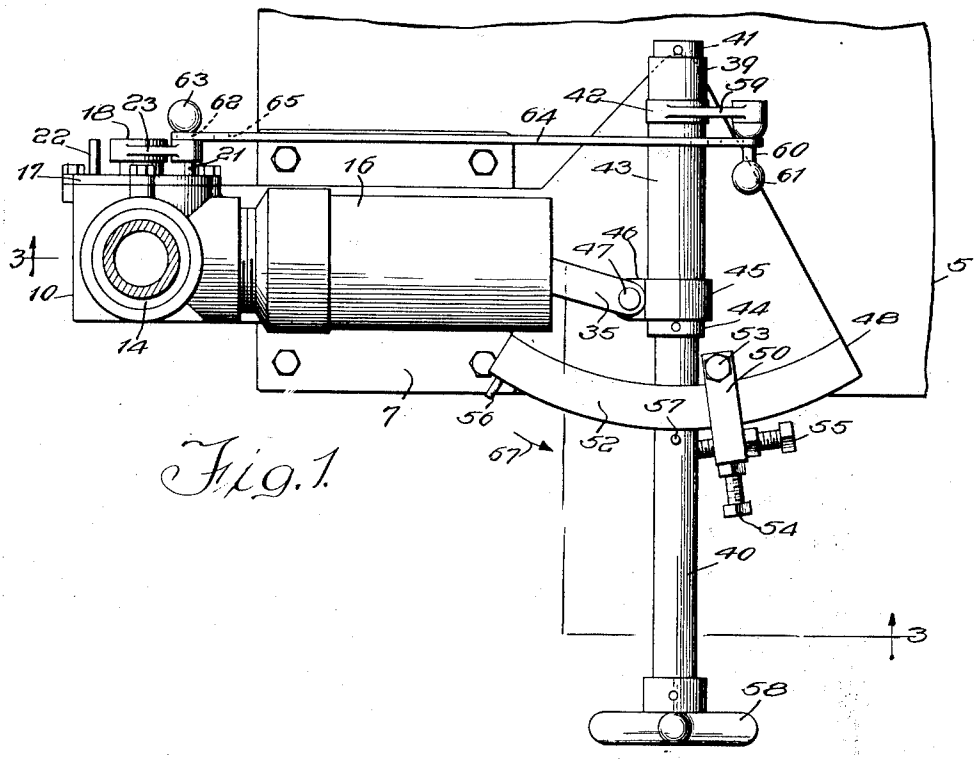
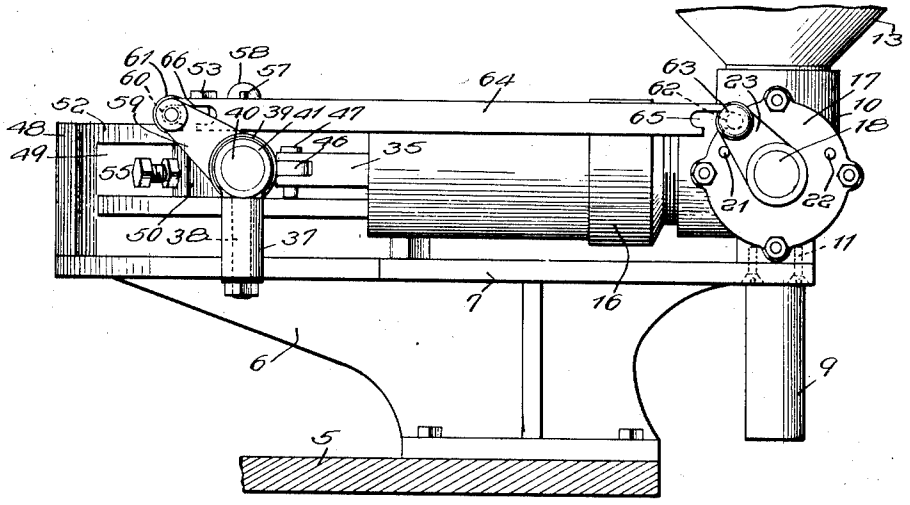


Fig. 1.

Fig. 2.



Witness:
William R. Kilroy

Inventor:
Ralph B. Bagby
By Wm. O. Belt
Atty.

Dec. 5, 1933. R. B. BAGBY 1,937,803

FILLING MACHINE

Filed July 20, 1931 2 Sheets-Sheet 2

Fig. 3.

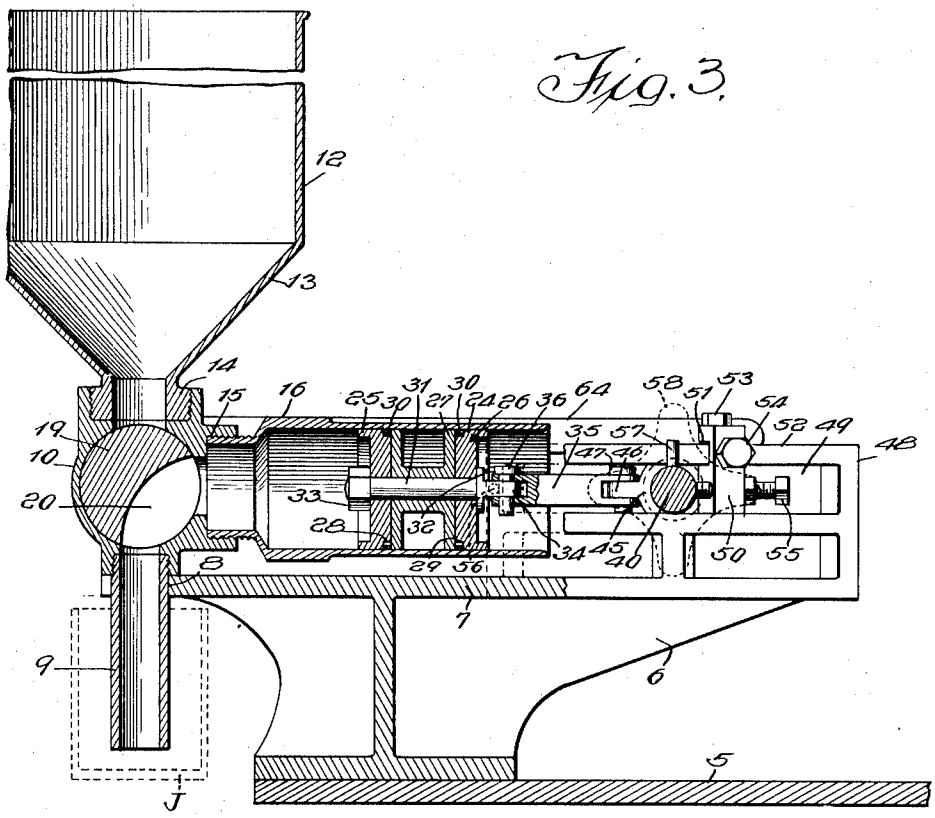
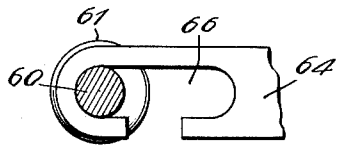


Fig. 4.



Witness:
William L. Kilroy

Inventor:
Ralph B. Bagby
By Wm. O. Bell
Atty.

Patented Dec. 5, 1933 1,937,803

UNITED STATES PATENT OFFICE

1,937,803

FILLING MACHINE

Ralph B. Bagby, Evanston, Ill.

Application July 20, 1931. Serial No. 551,829

16 Claims. (Cl. 221—103)

This invention relates to filling machines especially adapted for use in filling containers with a viscous substance such as cheese, fruit butters, salad dressings, or the like.

In filling containers with viscous substances, air is sometimes trapped and as a result the proper quantity is not introduced into the container and when the filling is done manually it is slow and consequently expensive. The salient object of my invention is to fill containers rapidly and economically and in such a manner that air will not be trapped.

Further objects are to provide a novel filling machine of simple and economical construction and efficient and positive operation which may be easily operated to discharge a predetermined quantity of a substance into the container; which will have a single member for operating the moving elements of the machine; and which will include an adjustable device for determining the quantity of substance discharged by the filling machine.

In the selected embodiment of the invention illustrated in the accompanying drawings

Fig. 1 is a plan view;

Fig. 2 is a rear elevation;

Fig. 3 is a view taken substantially on the line 3—3 on Fig. 1; and

Fig. 4 is a detail view of a connection employed in the device.

In the selected embodiment of the invention illustrated in the accompanying drawings, 5 indicates a supporting structure, such as a table top or the like, to which the base 6 of my improved filling machine is secured by bolts or the like. The base includes a top ledge 7 having an opening 8 at one end thereof. A discharge pipe 9 is passed through the opening 8 and has screw-threaded connection with one end of a substantially T-shaped valve housing 10, the adjacent end of the valve housing being secured to the adjacent portion of the ledge 7 by bolts 11 (Fig. 2). A hopper 12 includes a funnel-shaped portion 13 terminating in a neck 14 having screw-threaded conection with the valve housing opposite the pipe 9. In the valve housing 10, intermediate the portions having the pipe 9 and the neck 14 connected thereto, is an opening 15 and one end of a cylinder 16 is screw threadedly connected in this opening. One end of the valve housing 10 is closed by a removable plate 17 through which the stud 18, unitary with the valve member 19, is extended. The valve member 19 is rotatable in the valve housing 10 and includes a cutaway portion 20. When the valve member is disposed in the position illustrated in Fig. 3, communication is established between the discharge pipe 9 and the interior of the cylinder 16 through the cutaway portion 20 and at this time the periphery of the valve member closes communication to the hopper 12. However, when the valve member is rotated substantially ninety degrees from the position illustrated in Fig. 3, communication between the hopper 12 and the cylinder 16 is established through the cutaway portion of the valve member while communication to the discharge pipe 9 is closed. On the removable plate 17 are two studs 21 and 22 and on the stud 18 is an arm 23. When the arm 23 is engaged with the stud 21, the valve member is arranged in the position illustrated in Fig. 3, but when the arm 23 is moved into engagement with the pin 22, the valve member is disposed in the position wherein communication is established between the hopper and the cylinder.

In the cylinder 16 is a piston, generally indicated by 24, including end sections 25 and 26 and an intermediate section 27. The intermediate section is substantially H-shaped cross-section and the end sections 25 and 26 are engaged with the outer portions thereof. In the periphery of the end sections 25 and 26 and in the face thereof engaged with the intermediate section 27 are piston ring grooves 28 and 29 in which piston rings 30 are arranged. A stud bolt 31 is passed through an axial bore in the parts 26, 27 and 25 so that the head 32 thereon abuts the end section 26 and by tightening the nut 33 the piston sections are clamped together.

The portion 34 of the stud bolt, projecting beyond the head 32, is flat so that it can be inserted into the adjacent bifurcated end of the pitman 35, openings being provided in the adjacent portions of the pitman and in the portion 34, and a pin 36 is passed through these openings to detachably interconnect the pitman and the piston.

On the ledge 7 is a vertically extending sleeve 37 through which a stem 38 is passed. At one end of the stem is a bearing 39 which rests on the upper end of the sleeve 37 and a nut 40 on the other end of the stem prevents displacement from the sleeve. One end of a shaft 40 is passed through the bearing 39 and has a collar 41 fast on one end thereof. A ring 42 is fast to the shaft 40 on the opposite side of the bearing 39 and the ring and collar hold the shaft against endwise displacement from said bearing. A sleeve 43 is provided about the shaft

40 and extends between the ring 42 and a ring 44 fast on the shaft. On the sleeve 43 is a clamp member 45 having a flattened portion 46 to which the adjacent bifurcated end of the pitman 35 is detachably connected by a removable pin 47. Extending upwardly from the ledge 7 is a segmental bracket 48 having a slot 49 therein through which the shaft 40 passes. A clamp 50 has a slot 51 therein to receive the rail 52 at the top of the slot 49 and a bolt 53 passes across the end of the slot 51 to prevent displacement of the clamp from the rail. A set screw 54 secures the clamp 50 in adjusted positions in the slot 49. Extending through the clamp 50 and substantially parallel to the slot 49 is a screw 55, the purpose of which will be brought forth presently. At the end of the segmental bracket 48 in juxtaposition to the cylinder 16 is a stop pin 56 engageable by a pin 57 on the shaft 40. A handle 58 on the shaft 40 facilitates rotation thereof as well as movement through the slot 49. On the ring 42 is an arm 59 having a pin 60 at the outer end thereof carrying a ball 61. At the outer end of arm 23 is a pin 62 having a ball 63 at the outer end thereof. At one end of the link 64 is a slot 65 embracing the pin 62 and a slot 66 at the other end thereof embraces the pin 60.

When it is desired to use the machine, the valve 19 is arranged in the position shown in Fig. 3 and the substance that is to be introduced into the container is poured into the hopper 12, and the shaft 40 will be positioned at the left hand end of the slot 49 as viewed in Figs. 1 and 3. After this has been done, the handle 58 is grasped and the shaft 40 is rotated to engage the pin 57 with the pin 56 and when this is done, the ring 42 and arm 59 will be moved whereby movement will be imparted through the link 64 to the pin 62 and the arm 23 will be shifted from the position shown in Fig. 2 to engage the arm 23 with the pin 22 whereupon communication will be established between the cylinder 16 and the hopper 12. When the shaft 40 is moved in the direction of the arrow 67 (Fig. 1), movement will be transmitted through the pitman 35 to the piston 24 whereby said piston will move through the cylinder 16 to tend to create a vacuum in said cylinder whereupon material will be drawn from the hopper 12 through the cutaway portion 20 into the cylinder 16. The shaft 40 will be moved in the direction of the arrow 67 until it engages the screw 55 on the clamp 50. The clamp 50 will be positioned in the slot 49 to so limit movement of the shaft 40 that the quantity of material drawn into the cylinder 16 will be equal to that which it is desired to introduce into the particular container to be filled. The clamp 50 is retained in this position by the set screw 54 which may have a lock nut provided thereon to prevent displacement. The clamp 50 is positioned to provide the first adjustment and the final or nice adjustment is made by properly locating the screw 55 which may also have a lock nut thereon to prevent displacement. As soon as the shaft 40 engages the screw 55 or clamp 50, the handle 58 is turned to rotate the shaft 40 whereby the arm 59 will be moved into the position shown in Figs. 1 and 2 whereupon movement will be transmitted through the link 64 to position the arm 23 in the position shown in Fig. 2; that is, in engagement with the pin 21, whereupon the valve member 19 will be arranged in the position shown in Fig. 3 and communication will be established between the cylinder 16 and the discharge pipe 9. The container J to be filled will be positioned about the pipe 9 with said pipe extending thereinto to terminate adjacent the bottom thereof. Immediately following this, the shaft 40 will be moved in the direction opposite to the arrow 67 whereupon the material previously drawn into the cylinder 16 will be forced therefrom out through the discharge pipe 9 into the discharge container J which, as the material is forced thereinto, will be lowered, care being taken to keep the end of the pipe 9 below the level of the material in the container J and at the time the shaft 40 reaches the end of the slot 49 sufficient material will be forced from the cylinder 16 to completely fill the container. The handle 58 and shaft 40 will then be rotated to engage the pin 57 with the pin 56 whereupon the arm 23 will be engaged with the pin 22 and communication will be established between the hopper 12 and the cylinder 16, while communication between the cylinder 16 and the discharge pipe 9 will be shut off. The shaft 40 is then moved through the slot until the screw 55 is engaged whereupon said shaft is again rotated to turn the valve to shut off communication between the hopper 12 and the cylinder 16 and to open communication between said cylinder and the discharge pipe whereupon movement of the shaft 40 in the direction opposite the arrow 67 will discharge the material. This alternate turning of the shaft 40 and movement thereof through the slot 49 may be carried out in a very rapid manner, and hence the filling of the containers will be greatly expedited. Moreover, since the material may be introduced into the bottom of the container so that the container will be filled upwardly, it is manifest that the likelihood of entrapment of air is greatly reduced and hence no pockets are formed. By properly positioning the clamp 50 and the screw 55, the proper amount of material will be drawn into the cylinder and discharged therefrom on each operation of the shaft 40. Consequently, waste of material is obviated. By providing the pin and slot connections at the ends of the links, binding of these portions is prevented and moreover this permits turning of the valve into either position at either end of the stroke which may be desirable under certain conditions.

An important advantage of this device is that the hopper whereat the weight will be greatest is supported directly about the anchorage of the device to the base. Moreover, the cylinder is supported from the same anchorage and by disconnecting the pitman, the piston may be readily removed from the cylinder, and the cylinder may then be unscrewed from the valve housing. By removing the plate 17, the valve may be removed and the other parts of the mechanism, screw-threadedly joined to the valve housing, may be readily removed. Consequently, cleaning of the device is greatly facilitated. Moreover, by reason of the sectional construction of the pitman, this part may be readily disassembled to facilitate cleaning thereof, especially around the rings which may be very easily removed when the parts of the piston are separated.

While I have illustrated and described a selected embodiment of my invention, it is to be understood that this is capable of variation

and modification and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the spirit and scope of the following claims:

I claim:

1. In a filling machine having a supply and a discharge, filling means, valve means alternately connecting said supply and said discharge with said filling means, and a pivotally rotatably mounted shaft for operating the filling means and the valve means.

2. In a filling maching having a supply and a discharge, filling means including a reciprocal member, valve means alternately connecting said supply and discharge to said filling means, and a pivotally and rotatably mounted shaft for operating said reciprocal member and said valve means.

3. In a filling machine having a supply and a discharge filling means including a reciprocal member, valve means alternately connecting said supply and discharge to said filling means, operating means for said valve means, and an operating means for said reciprocal member and having a part movable relative thereto for actuating the operating means for said valve.

4. In a filling machine having a supply and a discharge, filling means including a reciprocal member, valve means alternately connecting said supply and discharge to said filling means, operating means for said valve means, operating means for said reciprocal member, and a pivotally and rotatably mounted shaft for operating the operating means for said valve means and said reciprocal member.

5. In a filling machine, a valve having an inlet and an outlet and an opening intermediate said inlet and outlet, filling means connected to said opening and including a reciprocal member, and a pivotally and rotatably mounted shaft adapted to be rotated in one direction to position said valve to connect said filling means with the inlet of said valve as said shaft is pivoted to move said reciprocal member away from said valve and said shaft being rotatable in the other direction to position said valve to connect said filling means with the outlet of said valve as said shaft is pivoted to move said reciprocal member toward said valve.

6. In a filling machine, a valve having an inlet and an outlet and an opening intermediate said inlet and outlet, filling means connected to said opening and including a reciprocal member, and operating means for said reciprocal member and having a part movable relative thereto for operating said valve whereby said filling means may be connected with the inlet of said valve during movement of said operating means in one direction and said filling means may be connected with the outlet of said valve during movement of said operating means in the other direction.

7. In a filling machine, a base, a substantially T-shaped valve housing mounted on said base, a supply member connected to one end of said valve housing, a discharge member connected to the other end of said valve housing, a cylinder connected to said valve housing intermediate said supply and said discharge members, a valve member in said valve housing alternately connecting the supply and discharge members with the cylinder, a reciprocal piston in said cylinder, and a pivotally mounted shaft mounted for movement over said base to reciprocate said piston and axially rotatable to operate said valve member.

8. In a filling machine, a base, a substantially T-shaped valve housing mounted on said base, a supply member connected to one end of said valve housing, a discharge member connected to the other end of said valve housing, a cylinder connected to said valve housing intermediate said supply and said discharge members, a valve member in said valve housing alternately connecting the supply and discharge members with the cylinder, a reciprocal piston in said cylinder, and means mounted on said base for operating said valve member and said piston, said last-named means including a shaft mounted for pivotal movement over said base and for axial rotation in the pivotal mounting therefor whereby said shaft may be rotated to turn said valve member to open communication between the supply member and the cylinder and then be pivoted to move said piston away from said valve housing whereby said shaft may again be rotated to open communication between said cylinder and said discharge member and may then be pivoted to move said piston toward said valve housing.

9. In a filling machine including a valve including an inlet and an outlet and having a cylinder connected thereto, a valve member in said valve for alternately connecting the cylinder with the inlet and outlet of the valve, a reciprocal piston in said cylinder, a pivotally mounted shaft connected to said piston for imparting reciprocal movement thereto, and means connecting said shaft and said valve member whereby said shaft may be rotated to operate said valve member.

10. In a filling machine including a valve including an inlet and an outlet and having a cylinder connected thereto, a valve member in said valve for alternately connecting the cylinder with the inlet and outlet of the valve, a reciprocal piston in said cylinder, a pivotally mounted shaft connected to said piston for imparting reciprocal movement thereto, means connecting said shaft and said valve member whereby said shaft may be rotated to operate said valve member, and means limiting the pivotal movement of said shaft to regulate the movement of said piston to determine the quantity of material drawn into said cylinder from said inlet and discharged from said cylinder through said outlet.

11. In a filling machine including a valve including an inlet and an outlet and having a cylinder connected thereto, a valve member in said valve for alternately connecting the cylinder with the inlet and outlet of the valve, a reciprocal piston in said cylinder, a pivotally mounted shaft connected to said piston for imparting reciprocal movement thereto, means connecting said shaft and said valve member whereby said shaft may be rotated to operate said valve member, a member having a slot therein through which said shaft is extended, and adjustable means in said slot to be engaged by said shaft to limit movement of said shaft through said slot to determine the quantity of material drawn through said inlet into said cylinder and discharged from said cylinder through said outlet.

12. In a filling machine having a supply and a discharge, filling means, valve means alternately connecting said supply and discharge with said filling means, a pivotally mounted shaft for operating the filling means, and fixed

means for limiting pivotal movement of the shaft in one direction and adjustable means for limiting movement of said shaft in the other direction to regulate the operation of said filling means so that it may be operated in a uniform manner in said one direction and in a variable manner in said other direction.

13. In a filling machine, filling means including a reciprocating member, an oscillating valve controlling flow to and discharge from said filling means, a pivotally and rotatably mounted shaft, means connecting said shaft to said valve member whereby rotation thereof operates said valve member, means limiting the rotation of said shaft, and means connecting said shaft to said reciprocal member whereby pivoting of said shaft operates said reciprocal member.

14. In a filling machine, filling means including a reciprocating member, an oscillating valve controlling flow to and discharge from said filling means, a pivotally and rotatably mounted shaft, means connecting said shaft to said valve member whereby rotation thereof operates said valve member, means limiting the rotation of said shaft, means connecting said shaft to said reciprocal member whereby pivoting of said shaft operates said reciprocal member, and means preventing rotation of said reciprocal member in said filling means.

15. In a filling machine having a supply and a discharge, filling means including a reciprocal member, valve means alternately connecting said supply and discharge to said filling means, a pivotally and rotatably mounted shaft, means connecting said shaft to said reciprocal member whereby pivoting of said shaft is transmitted to said reciprocal member to cause operation thereof, means connecting said shaft to said valve means whereby rotation of said shaft operates said valve means, means limiting the pivotal movement of said shaft, and other means limiting the rotatable movement of said shaft.

16. A filling machine including a valve housing having inlet and outlet openings and an intermediate opening, a supply member, means integral with the valve housing and supply member for detachably connecting said supply member to the inlet of said valve housing, a discharge member, means integral with the discharge and the valve housing for detachably connecting the discharge member to the outlet of said valve housing, a valve member in said valve housing, a retaining member, removable means detachably connecting the retaining member in position to removably retain said valve member in said valve housing, filling means including a cylinder, means integral with the cylinder and the valve housing for detachably connecting said cylinder to said intermediate opening, a piston in said cylinder, operating means for said piston, and disengageable means detachably connecting said piston to said operating means, the integral detachable means permitting said supply member, discharge member, and cylinder to be disengaged from said valve housing, said disengageable means permitting said piston to be removed from said cylinder, and said removable means permitting the detachment of said retaining member to permit removal of said valve member whereby the parts may be expeditiously disassembled to facilitate cleaning of the filling machine.

RALPH B. BAGBY.