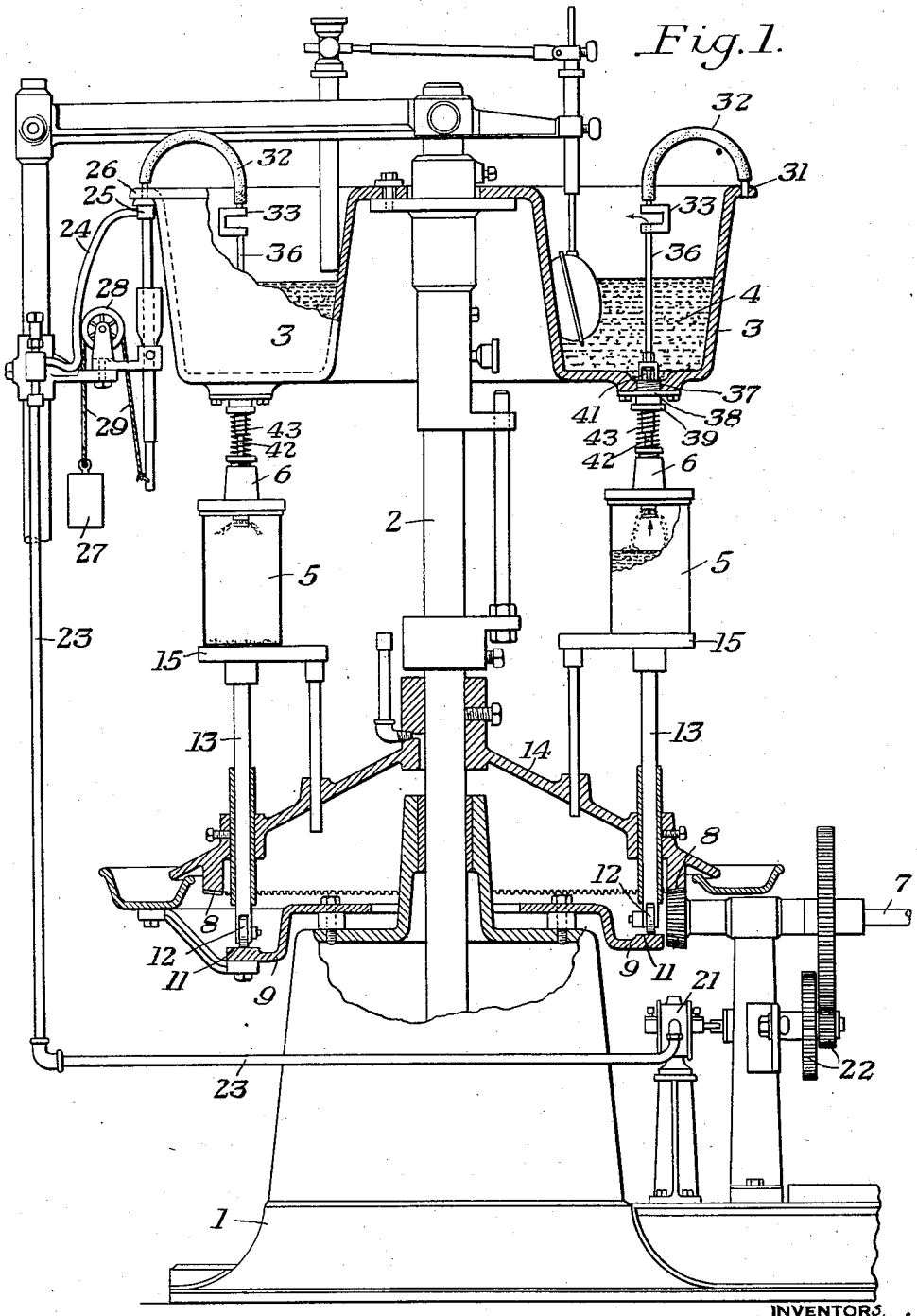
Oct. 28, 1930. D. M. HAUGER ET AL 1,779,879

FILLING MACHINE

Filed May 13, 1927 2 Sheets-Sheet 1

Fig. 1.



INVENTORS

David M. Hauger, Joseph E. Dunn,
William J. Wolbert, Jesse E. Weaver
by Byrnes, Stebbins & Parmelee,
Their attorneys.

Oct. 28, 1930. D. M. HAUGER ET AL 1,779,879

FILLING MACHINE

Filed May 13, 1927 2 Sheets-Sheet 2

Fig. 4.

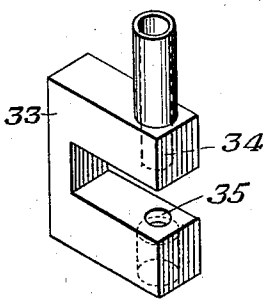


Fig. 2.

Fig. 3.

INVENTORS

Daniel M. Hauger, Joseph E. Dunn,
William J. Wolbert, Jesse E. Weaver,
By Byrnes, Stebbins & Parmelee,
Their attorneys.

Patented Oct. 28, 1930

1,779,879

UNITED STATES PATENT OFFICE

DAVID M. HAUGER, JESSE E. WEAVER, WILLIAM G. WOLBERT, AND JOSEPH E. DUNN, OF PITTSBURGH, PENNSYLVANIA, ASSIGNORS TO McKENNA BRASS & MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

FILLING MACHINE

Application filed May 13, 1927. Serial No. 191,230.

Our invention relates to a filling machine and more particularly to apparatus for controlling the gases entrapped in a receptacle during a filling operation.

One object of our invention is to provide a filling machine in which gases entrapped in a receptacle being filled are released without spattering the material being filled over adjacent objects.

Another object of our invention is to provide a head or filling apparatus for filling machines that shall have provision for the compression of an appreciable quantity of gas above the receptacle being filled.

Another object of our invention is to provide a filling machine in which a quantity of the gas contained in a receptacle being filled is compressed in order to assist in the release of the receptacle from the filling machine.

A further object of our invention is to provide a head or filling apparatus for a filling machine that is provided with a recessed surface adjacent to a receptacle being filled for compressing a portion of the gases initially contained in the receptacle, thereby enabling more uniform filling of successive receptacles.

Certain features of the present invention are improvements over the structure shown and described in the patent to Haller, 1,425,960, issued August 15, 1922, and assigned to the McKenna Brass & Manufacturing Company. In the machine filling of certain receptacles such as bottles, cans and the like, it is customary practice to provide a tube for the escape of gases entrapped in the receptacle being filled. Provision is also made for blowing out the escape tube between the successive filling operations. However, during the filling operation when air is escaping from the receptacle, a certain amount of the liquid is discharged from the escape pipe together with the escaping gases. We propose to eliminate such undesirable discharges by providing a passageway in the escape pipe that permits air to be blown across an opening in one direction and prohibits the passage of the mixed escaping gases and particles of matter in the opposite direction.

In filling machines, it is customary to provide a filling head that makes a hermetical seal with the top of a receptacle such as a can or a bottle during the filling operation. We have found that when the lower surface of such a head is substantially flush with the top of the receptacle being filled, there is frequently a tendency for the receptacle to adhere to the head by reason of the existence of a vacuum between the head and the receptacle at the time at which it is desired to discharge the receptacle. By providing a space in which a quantity of gas may be compressed during the filling operation, we provide a positive pressure for assisting in the release of the receptacle at the desired time.

Also when the face of the filling head is substantially flush with the top of the container small particles of solid matter may congeal on the lower face of the filling head between successive filling operations and be projected into and withdrawn from successive containers, thereby causing variation in the weight of contents of the containers. By providing a recess adjacent to the filling nozzle, we have provided a space the face of which normally does not come in contact with the filling material. Such accumulations of liquid and solid matter as may be deposited, do not project downwardly into the containers but break off and fall into the receptacles, thereby cleaning the face of the surface without affecting the weight of the contents of the containers being filled.

Our invention is particularly adapted for use in connection with the filling of containers with liquid or semi-liquid material such as cans of soup, sauce for baked beans and other canned foods, although it is to be understood that the invention is applicable to other uses and these particular applications of the invention are given as illustrations of the invention, not as limitations.

In the accompanying drawings which constitute an illustrative embodiment of our invention,—

Figure 1 is a view, partially in elevation and partially in section, of a filling machine embodying our invention;

Figure 2 is a sectional view of the filling head shown in Fig. 1 in its closed position;

Figure 3 is a view, partially in elevation

and partially in section, of the filling head when it is in its operative position; and

Figure 4 is a perspective view of a detail of the invention.

Our invention may comprise in general a base 1 that supports a vertically extending shaft 2 on which is mounted a tank 3 containing a supply of liquid 4 such as soup, baked bean sauce or the like, that is being automatically fed into receptacles 5 such as tin cans, through a filling head 6.

The shaft 2 is driven by a shaft 7 from any suitable source of power (not shown) through a beveled gear 8 that is rigidly attached to the shaft 2. A plate 9 is secured to the base 1 and is provided with an irregular or cammed surface 11 over which a plurality of rollers 12 pass as the shaft 2 revolves.

The rollers 12 are journalled in the lower ends of rods 13 that extend upwardly through and are guided by an apron 14 carrying the bevel gear 8, whereby the rods 13 are held in circumferential alinement about the shaft 2 but are permitted to have relative vertical movement as the rollers 12 pass over the different portions of the track 11. The rods 13 terminate in plates 15 constituting receptacle supports for maintaining the receptacles 5 directly beneath the respective filling head 6.

A compressor 21 is driven by the shaft 7 through a gear train 22 and is connected by a pipe 23 to a flexible tube 24 that, in turn, is connected to a head 25 that is biased against overhanging surface 26 of the tank 3 by a weight 27, a pulley 28 and a cord 29.

The overhanging edge 26 is provided with a plurality of perforations 31 that are connected by flexible tubes 32 with the filling heads 6. The number of the perforations 31 corresponds with the number of filling heads 6 provided on the machine.

As the tank 3 is rotated, the head 25 is successively brought into engagement with the openings 31 in timed relation to the initial stage of the operation of filling the receptacles 5. As the head 25 comes into alinement with each of the openings 31 a jet of air is blown into the co-operating tube 32 and downwardly into the filling head 6 in a manner more fully hereinafter described. The details of construction and operation of the head 26 constitute one of the features of the Haller patent 1,425,960 heretofore referred to.

The tubes 32 are connected to one side of a coupling unit 33 shown in detail in Fig. 4. The unit 33 may be of C shape and have alined passages 34 and 35 in its upper and lower arms whereby an opening is formed. When air is blown downwardly through the tube 32, its kinetic energy is such as to cause it to traverse the space between the openings 34 and 35 and continue downwardly in the opening 35. However, particles of liquid and solid matter traveling upwardly through the opening 35 are unable to move up and into the opening 34. By reason of this feature of our invention, the spattering of liquids between the head 25 and the surface 26 is avoided.

Referring particularly to Fig. 2, the filling heads 6 each comprise a tube 36 that extends upwardly into the tank 3 above the level of the liquid 4. The bottom of the tank 3 is provided with a plurality of openings 37 under which are bolted plates 38 that constitute portions of the filling heads 6. Casings 39 have threaded connections with the plates 38 and extend upwardly into the tank 3 where they are provided with openings 41 through which the fluid can pass under the influence of the force of gravity or pressure in the tank 3, as desired. Each casing 39 extends downwardly and through the bottom of the tank 3 and has a liquid-tight sliding engagement along its inner face with a sleeve 42 that is normally biased in a downward direction by a coil spring 43 that extends between a seat 44 on the casing 39 and a seat 45 on a collar 46 disposed at an intermediate point on the sleeve 42. By reason of this connection the sleeve 42 has longitudinal movement relative to the casing 39.

The collar 46 is provided with outwardly projecting threads 47 for engagement with inwardly projecting threads 48 formed on cup-shaped member 49 that terminates in a downwardly extending flange 51 for securing a resilient packing body 52, such as rubber. The packing 52 is adapted for engaging the upper edges of the receptacle 5. By reason of the threaded engagement between the collar 46 and the cup-shaped member 49, it is possible to adjust the position of the packing 52 with respect to the mouth 53 of the sleeve 42. A clamp 54 is provided for preventing undesired turning movement between these members when once adjusted. A body of packing 55 is placed between the sleeve 42 and the interior of the cup-shaped member 49 for preventing the leakage of air along the sleeve 42.

The lower surface of the packing 52 is provided with a depression 56 in which a recessed plate 57 is secured by screws 58. A recess is thus provided in which a quantity of gas may be compressed during the filling operation and to the face of which small particles of solid matter 58 may adhere from time to time without extending downwardly into and varying the contents of the receptacles 5. The accumulations of solid matter 58 break off from the plate 57 from time to time by reason of their own weight and, accordingly, the plate 57 is self cleaning.

A tube 61 mounted within each casing 39 has a threaded connection with the co-operating tube 36 to constitute a continuation thereof, and extends downwardly through the

sleeve 42. Since each tube 61 is attached to one of the casings 39 each sleeve 42 is longitudinally movable relatively thereto. Each tube 61 terminates in a valve 62 that normally closes the lower end of the sleeve 42 against the pressure of the spring 43. The faces 64 of the valves 62 are gently curved in order to insure that liquid traversing the sleeves 42 shall be projected downwardly after it leaves the sleeve rather than laterally, thereby preventing foaming and spraying in the receptacles 5. Each valve 62 is also provided with opposed elongated narrow slots 65 that connect the interior of the tube 61 with the space in the receptacle 5. The shape of the slots is determined by the character of the liquid passing through the filling head 6. Where the ingredients of the liquid 4 are such that husks must be handled, we have found it advisable to make the slots 65 very long and very narrow. The distance that the sleeve 42 extends downwardly below the lower face of the packing 52 determines the depth of the contents of the receptacle 5 as is more fully hereinafter described.

In the operation of the filling machine, the shaft 2 is turned at a predetermined speed and receptacles 5 are fed to and removed from the plates 15 by hand or by any suitable mechanism (not shown). The operation of the successive plates being the same, the description will now refer to a given plate. As an empty receptacle is placed on tne given plate 15 the associated roller 12 traverses the track 11 and the rod 13 is raised upwardly, thereby bringing the receptacle 5 into engagement with the face of the packing 52 as is shown in Fig. 3. At the time of engagement of the receptacle 5 with the packing 52, the relation between the head 25 and the co-operating opening 31 is such that a jet of air passes from the compressor 21 through the pipe 23, the flexible tube 24, the head 25, the opening 36, the tube 32, the coupling unit 33, the tube 36, the tube 61 and the slots 65 to blow out any particles of matter that may have become lodged therein.

When the opening 31 has passed beyond the head 25, the foregoing connection is broken and liquid flows downwardly through the casing 39 and the sleeve 42 and simultaneously the air in the receptacle 5 moves upwardly through the tube 61 and 36 to the unit 33. Since the unit 33 is placed within the tank 3, any particles of liquid discharged from the opening 35 fall back into the liquid 4, thereby eliminating any tendency towards spattering the liquid over adjacent machinery and operators.

When the level of the contents in the receptacle 5 reaches the lower end of the sleeve 42 and seals the same, further discharge of gas is prevented and the entrapped gas is compressed, thereby building up a pressure preventing the discharge of further liquid through the sleeve 42. This condition prevails until the support 15 has travelled into such a position that its rod 13 drops sufficiently to permit the removal of the receptacle 5 from the packing 52. As the receptacle 5 moves downwardly, the spring 43 expands and closes the valve 62.

By reason of the gas entrapped in the recess of the plate 57, no difficulty is experienced in removing the receptacle 5 as the expansive force of the gas and the vapor pressure of the liquid in the receptacle both exert an expansive force between the receptacle 5 and the packing 52 thereby permitting the quick release of the receptacle.

Accordingly, we have provided apparatus for cleaning out the air vent in a filling machine without the possibility of small particles of liquid being discharged from the escape vent at undesirable points. Another important feature of our invention is the provision of a filling head that is provided with a recess for the entrapment of and compression of a body of gas above the receptacle being filled in order to assist in the release of the receptacle in a later operation.

While we have shown and described our invention as embodied in a machine that is particularly adapted for filling cans with soup, saucing baked beans and the like, it is obvious that the invention is capable of utilization for filling other types of receptacles with other kinds of matter.

It is to be understood that various changes in the size, shape and disposition of the component parts of our invention may be made without departing from the scope of the appended claims.

We claim:

1. In a filling machine, a tank, a filling tube connected therewith, a fluid vent for the filling tube, and means for supplying fluid to the vent from a source external to the tank and comprising a member having a broken portion therein across which the fluid under pressure passes and which prevents the movement of particles of matter to the fluid source.

2. In a filling machine, a vent including a coupling unit having a pair of spaced alined conduits for directing a stream of fluid across an intermediate space, a considerable portion of which is permanently open to the air.

3. In a filling machine, a vent including a coupling unit comprising a frame having a pair of spaced alined conduits disposed in opposing faces of an open sided portion, whereby a column of fluid may be directed across the open sided portion, but small particles of matter are prevented from crossing the open space between the ends of the conduits.

4. In a filling machine, a tank, a filling tube connected therewith, a fluid vent for the filling tube, means for supplying fluid to the

vent having a broken portion, and means for periodically projecting a stream of fluid across the open portion for cleaning the vent, said broken portion permitting the escape of fluid from the vent during the filling operation without traversing the projecting means.

In testimony whereof we have hereunto set our hands.

DAVID M. HAUGER.
JESSE E. WEAVER.
WILLIAM G. WOLBERT.
JOSEPH E. DUNN.