SANITARY DISPENCING NOZZLES FOR FILLING MACHINES

Herman D. Manas, Roslyn Estates, N.Y., assignor to M.R.M. Company, Inc., Plainview, N.Y., a corporation of New York

Filed Dec. 19, 1962, Ser. No. 245,729

3 Claims. (Cl. 141—295)

This invention relates to sanitary dispensing nozzles for filling machines intended to fill containers with fluid fillings.

Filling machines for filling containers with liquids are in wide use and it is conventional in machines of this kind to utilize a plurality of dispensing nozzles secured to a common distributor head to fill a plurality of containers simultaneously with the fluid. The individual dispensing nozzles in use heretofore have been of relatively complex multi-part construction and have proved difficult to clean or service and repair. Moreover, the filling fluids frequently are of a kind that deteriorate with time or become rancid, or otherwise objectionable and also tend to leave deposits of solid or semi-solid character on internal parts of the nozzle, accumulating mostly in inaccessible crevices and interior surfaces of the nozzles. Deteriorating or rancid surface films of such fluid or containing deposits on such surfaces are objectionable because they tend to contaminate the filling fluid being delivered to containers. In consequence, health authorities have, in the past, refused to approve filling machines for use with such filling fluids unless frequent replacement of the dispensing nozzles was practiced. Such replacement requirements have proved to be a prohibitory expense and the removed nozzles because of the complexities of their constructions, location of contaminating deposits on inaccessible surfaces and resultant expense and difficulty of cleaning have not been economical to salvage by repair or rebuilding. The market, therefore, for filling machines for fluids of this type has been restricted, if not obliterated.

Principal objects and features of this invention are the provision of novel sanitary dispensing nozzles useful for all types of filling fluids which will satisfy health authorities because of their complete cleanability and simple quick replaceability after prescribed time intervals of use.

Other objects and features of this invention are the provision of novel and simply constructed sanitary dispensing nozzles applicable readily to all conventional types of filling machines that are extremely simple to disassemble and in which the separate components have all their internal and external surfaces readily accessible for complete and quick cleaning so that all contaminants collecting thereon may be removed completely and quickly.

Further objects and features of the invention are the provision of sanitary dispensing nozzles that may be readily disassembled for cleaning and re-assembled by the relatively unskilled labor usually available as attendants for filling machines.

Further objects and features of the invention are the provision of sanitary dispensing nozzles for filling machines that will fully satisfy sanitary requirements of health authorities and render it economical and practical to use such machines for filling fluids that ordinarily deteriorate with time or cause contaminating deposits on internal parts of the nozzle.

Other objects and features of the invention will become apparent from the following specification and the accompanying drawings forming a part thereof, and wherein:

FIGURE 1 is a vertical section of a sanitary dispensing nozzle embodying the invention;

FIGURE 2 is a side elevation of the nozzle of FIGURE 1 viewed along the plane of line 2—2 of FIGURE 1, and in the direction of the arrows;

FIGURE 3 is an exploded sectional view of the nozzle of FIGURE 1, illustrating details of construction;

FIGURE 4 is a perspective assembly view of said nozzle;

FIGURE 5 is a vertical sectional view of a modified form of sanitary dispensing nozzle;

FIGURE 6 is a similar view of the nozzle of FIGURE 5 in a different position of operation, and

FIGURE 7 is an exploded view of the nozzle of FIGURE 5, illustrating details of construction.

Referring to the drawings and first to FIGURES 1—4 inclusive, the reference character 10 denotes a sanitary dispensing nozzle suitable for the practice of this invention, shown attached to a distributor head D of a conventional filling machine used to fill containers C moving along a conveyor B of said machine. In such machines which may be of any conventional rotary or straight line type, the containers C are moved to filling stations whereat the nozzles 10 on the distributor D are lowered to enter containers C for filling of the latter and then elevated to clear the filled containers.

The sanitary nozzle 10 comprises a tubular spout 11 having a smooth internal bore 12 with outlet orifices 13, which spout is intended to enter the container C when the nozzle is lowered for filling of said container. The wall at the lower end of spout 11 is tapered as at 13 and provided with a central orifice 14. An annular flange 15 integral with spout 11 is provided in proximity to its upper end 16. A cushioning ring or gasket 17 of rubber or other gasket-like material adapted to engage the lip L of the mouth of container C during filling is mounted on spout 11 to provide for temporary closure of the said mouth. Preferably, spout 11 and its flange 15 are of a readily cleanable rigid material such as stainless steel or other suitable metal or plastic material.

A block 18 of the same material as spout 11 and having a smooth vertical passageway or bore 18' extending for the full height of said block is removably fitted on the upper end 16 of said spout which extends telescopically into the lower end of said bore 18'. The lower end of said bore 18' is provided with a tapered annular seat 19 to receive an O-sealing ring 20 which, on assembly, will be compressed against the upper face of flange 15. A lateral hose-attaching intake flange 21 having a smooth tubular bore 22 communicating with passageway or bore 18' is provided on the block 18. Hose 23 from a source of filling fluid (not shown) is removably securable on the intake flange 21. The upper end of bore or passageway 18' is provided with an annular tapered valve seat 24 for the reception of an O-sealing ring 25.

A tubular pipe 26 of smaller external diameter than the inner diameter of spout 11 and extending substantially axially thereof and preferably of the same material as said spout 11 and with a smooth inner bore has its lower end removably fitted into the orifice 14 of spout 11. The upper end of said pipe 26 terminates in a cylindrical body portion 27 which fits telescopically and removably in the upper portion of passageway 18' of said block 18. An annular outwardly projecting flange 28 is provided on the outer cylindrical surface of body portion 27 which
3,175,591

3. overlies the upper surface of block 18 resting on the O-sealing ring 29 for compression of the latter on assembly. The bore portion 27 projects upwardly from flange 28 and carries another O-sealing ring 29 and fits telescopically and removably into a smooth vertical bore or passage way 30 of a second block 31 of the same material as block 18, said bore 30 having an annular tapered seat 32 to receive said O-sealing ring 29. The upper end of the passageway 30 is sealed by a pipe 26 opens into this bore or passageway 30. A lateral hose-attaching vacuum exhaust flange 34 having a smooth tubular bore 35 communicating with the passageway 30 is provided on the block 31. Hose 36 from a vacuum line (not shown) is removably securable on the exhaust flange 34. The upper end of the bore described is closed by an annular flange 30 provided with an annular tapered valve seat 37 to receive an O-sealing ring 38.

A cover member 39 preferably of the same material as spout 17 is provided for the upper end of bore 30. This cover member includes a cylindrical portion 40 that fits telescopically and removably into the upper end of bore or passageway 30 of block 31, an annular flange part 41 of substantially the same dimensions as flange 15 and an internally threaded socket portion 42 above flange 41, which may be screwed onto the threaded tip or nipple 43 of the distributor head D. The upper portions of cover member 39 may be modified in any way as required to facilitate attachment of the assembly to distributor head D.

Assembly binding posts 44 and 45, also preferably of the same material as block 31, are threaded in the flange 15 at 46 and 47 and provided with tightening heads 48, 49, overlying the upper face of flange 41 to secure the assembled parts described together for operation and also to compress the respective O-sealing rings 20, 25, 29 and 37 against their respective valve seats 19, 24, 32 and 37, thus establishing seals therein to prevent leakage. These binding posts 44 and 45 are readily removable to permit complete disassembly of the assembled parts for cleansing purposes.

In use of the dispensing nozzle 10 assembled as shown in FIGURES 1, 3 and 4, it is mounted on nipple 43 of the distributor D. Filling hose 23 is attached to intake flange 21 and the vacuum hose 36 is attached to exhaust flange 34. The distributor D is then lowered to insert spout 11 in container C until the gasket 17 is compressed on lip L of said container by flange 15 to seal temporarily the mouth of said container C. Vacuum is then connected to hose 36, serving for exhausting air from the container C via pipe 26 and passageways 30 and 35. Simultaneously filling fluid is connected to supply hose 23 which enters the container C via passageways 22 and 18', the spout 11 and orifices 12' filling the container to the desired level. Exhaust fluid is passed outwardly via pipe 26 after the exhaust air from the container.

When filling of the container C has been completed, filling fluid is cut off and the distributor D is elevated lifting spout 11 clear of the filled container C which then may be moved to conventional closure machinery or elsewhere as needed.

After a prescribed period of use as described, or whenever it is deemed necessary to clean the components of the dispensing nozzle 10, it is removed from the distributor D and disassembled by unscrewing of binding posts 44 and 45. Each of the separate components, namely, spout 11, blocks 18 and 31, pipe 26 and cover member 39, are separable from the others and may then be cleaned individually. As to each, it is to be noted that all surfaces in the disassembled parts are smooth and readily accessible for cleansing and that no recesses or sharp corners exist to collect debris that may harden and become difficult to remove. Thus, all components may be removed readily and quickly reassembled even by unskilled labor for further use in the filling machine. The construction described has been submitted to and approved fully by health authorities of cities and states in which the device is used and was developed to meet rigid requirements of such authorities.

A further embodiment also designed to meet these rigid requirements is illustrated in FIGURES 5 to 7 inclusive, relating to the so-called automatic dispensing type wherein the act of inserting the nozzle and the temporary sealing of the container thereby serves to release flow of filling fluid into the container.

Referring to FIGURES 5 to 7 inclusive, the sanitary dispensing nozzle 110 comprises an elongated hollow tubular spout member 111 of readily cleanable rigid material such as stainless steel or other suitable metal or plastic material which has a smooth center passageway 112 and is open at its bottom end 113. Outlet orifices 119' are provided in the wall of spout 111 near its lower end 115. A region 114 of the outer surface of spout 111 between its upper and lower ends is of reduced diameter for purposes presently to be described. The lower and upper junctions of this region 114 with the lower and upper larger diametrical portions of the spout are curved or tapered at 115 and 119 to provide smooth continuity and to facilitate cleansing of outer surfaces of said tubular spout 111.

An annular flange 116 is provided in proximity to the outer end of spout 111 and the body portion 117 of said spout above said flange 116 has lesser outer diameter than said flange for purposes to be described. A hollow, preferably of the same material as spout 111, having an integral tubular sheet 119 depending from its lower surface is slidably mounted on the spout 111. The inner smooth diameter of said sheet 119 is dimensioned to fit slidably over the larger diametrical outer surfaces of the spout 111 so as to define an annular tubular passageway 120 of block 118 of reduced diameter of said spout for purposes presently to be described. Downward sliding movement of sheet 119 and with it hollow block 118 is limited by the engagement of the lower end of sheet 119 with a sealing gasket 121 carried on a head 122 of a long rod 123 of the same material as spout 111. The rod 123 of lesser diameter than the inner diameter of spout 111 extends axially for the full length of the latter and outwardly beyond the upper end thereof terminating in a threaded portion 142. An inner tapered valve seat 124 is provided on the head 122 of the rod 123 which is engageable with the lower open end 113 of the spout 111. Vacuum in the rod 123 is tightened into place as will be described.

The block 118 has a tubular, smooth-walled chamber 125 of larger diameter than the outer diameter of spout 111. A lateral tubular flange 126 with a smooth passageway 127 communicating with chamber 125 is integral with block 118 and to this flange 126, an overflow mouth 128 may be removably attached. The upper end of block 118 is internally recessed to define an annular shoulder 129 on which a spacing ring 130, preferably of the same material as block 118 is adapted to be positioned. The inner diameter of ring 130 is dimensioned to fit slidably on the outer surface of block 118 and serves as the upper guide for sliding motion of block 118 axially of the length of spout 111. A second ring 131 of the same material as block 118 is superposed on ring 130 about spout 111. This ring 131 has a recess 132 in the face abutting ring 130 in which outer end of ring 130 is positioned. The two rings 130 and 131 fit closely within the upper end of body 118, the lower ring 130 resting on shoulder 129 and serve together with the O-sealing ring 132 to seal off the upper end of chamber 125. A biasing spring 134, preferably of the same material or coated with the same material as block 118 surrounds the spout member 111 positioned between the annular shoulder 116 thereof and the upper face of ring 131. This spring 134 tends to bias the block 118 to the position shown in FIGURE 5 wherein the lower end of sheath 119 engages and compresses O-sealing ring 121 to seal off the lower open end of said spout.
A second hollow block 135 of the same material as block 118 having a smooth walled tubular chamber 136 into which the upper body portion 117 of the spout member 118 is removably provided. An O-sealing ring 137 resting in an annular recess 138 in the bottom face of block 135 serves as a leakage seal when compressed in assembly of the parts. A lateral flange 139 having a smooth walled passageway 140 communicating with chamber 136 is provided on block 135. A hose 128 is removably attached to the lateral flange 139 and leads to a supply source (not shown) of filling fluid. The threaded upper end 142 of rod 123 projects through an opening 142 in the upper wall of block 135 and outwardly thereof for threaded engagement with tightening nut 143 preferably of the same material as block 135 and which has a cylindrical portion 144 that fits telescopically into an annular cavity 145 in the outer top surface of block 135. An O-sealing ring 146 is provided in a cavity 145 to seal the opening 142 when the nut 143 is tightened. A threaded nipple 147 projects upwardly of the polygonal part of the nut 143 for attachment of the assembled nozzle 110 in a threaded socket 148 of a distributor head D' of a conventional filling machine. If the distributor head D' has a nipple rather than a socket 148, the nipple 147 of nut 143 may be replaced by a socket or any other change may be effected to provide quick attachment of nut 143 and with it the nozzle 110 to said distributor D'.

A sealing gasket 149 of rubber or other suitable gasket material is mounted on sheath 114 below the lower face of block 118. It can readily be seen that assembly and disassembly of the nozzle 110 requires merely the tightening or loosening of a single member, the nut 143 so that the components of said nozzle may be quickly and easily mounted together or taken completely apart by an unskilled operator. In disassembled condition, all smooth internal and external surfaces of the various separate components are readily accessible for quick and adequate cleansing as needed. There are no hidden recesses or cavities in any of the parts in which filling fluid debris may collect and harden and become difficult to remove. Moreover, worn parts are quickly and easily replaced.

In operation of this embodiment the nozzle 110 assembled as shown in FIGURE 5 after being secured in the distributor head D' is lowered by the latter so that the lower end of the spout member 113 enters container C' and the lip L' of the latter bears against the sealing gasket 149. Further downward movement of head D' causes the longitudinal displacement of block 118 and its sheath 119 on the spout member 113 against the biasing action of spring 134 sufficiently to expose the orifices 113' of the spout member 113 and also to cause the lower end of sheath to be lifted clear of O-sealing ring 121 to a position above the lower shoulder-like surface 115 of the spout member 113 so that passageway 120 is now open at its lower end in the container C' as seen in FIGURE 6. Thus, filling fluid delivered by hose 141 can flow via passageway 140, chamber 136, spout passageway 112 and orifices 113' to fill the container C'. At the same time, air and gases in the container can escape via passageway 120, chamber 125 and passageway 127 to the exhaust hose 128. The position of parts shown in FIGURE 6 is maintained until desired filling of container C' has been accomplished. Thereafter, distributor head D' is elevated to withdraw spout 111 from the container. As soon as gasket 149 is lifted from lip L' of the container C' by this withdrawal, the spring 134 automatically re-extends the parts to the condition shown in FIGURE 5 wherein the sheath 119 closes off orifices 113' and its lower end engages O-sealing ring 121, thus cutting off inflow of fluid from hose 141 and also any outflow through hose 128.

After a prescribed period of use or whenever necessary, the nozzle 110 is disconnected from head D', disassembled quickly by removal of nut 143, the individual components quickly and readily cleansing as described and then reassembled and remounted on said head D' for further use.

While specific embodiments of the invention have been shown and described, variations within the scope of the appended claims are possible and are contemplated. There is no intention, therefore, of limitations as to the exact disclosure herein made.

What is claimed is:

1. A sanitary dispensing nozzle for a filling machine comprising a tubular spout member having a smooth internal bore with outlet orifices adjacent one end thereof and with an opening in said end and an annular external flange adjacent its other end, a block member with a smooth vertical bore removably positioned on said other end of said spout member, a lateral flange on said block member having a smooth passageway communicating with said smooth vertical bore, an elongated pipe having a smooth internal passageway removably positioned internally of said spout member and extending axially therewith endwise removable and annular flange named opening, said pipe having a cylindrical body extending adjacent its other end through which said last named passageway extends and a portion of which body fits removably in the upper end of said smooth vertical bore, an annular flange on said cylindrical body intermediate its ends, a second block member having a smooth vertical bore removably positioned on another portion of said cylindrical body lying outwardly of said last named annular flange, a lateral flange on said second block member having a smooth passageway communicating with said last named vertical bore, a closure member removably mounted on said second named block and having a cylindrical portion removably fitted into the upper end of said last named vertical bore and also having an annular flange overlying the second named block member, means on said closure member for securing said nozzle to a part of said filling machine, means extending between said first and last named annular flanges for clamping said block members and cylindrical body of said pipe in assembly and sealing means to prevent leakage from said assembly.

2. A sanitary dispensing nozzle as per claim 1 wherein said means extending between said first and last named annular flanges comprises bolt members.

3. A sanitary dispensing nozzle for a filling machine comprising a tubular spout member having a smooth internal bore with outlet orifices adjacent its lower open end and an annular external flange adjacent its open upper end, a hollow block member with a smooth vertical internal bore removably mounted on said spout member, a tubular sheath with a smooth internal bore depending from said block member and fitting slidably on said spout member, a lateral flange on said block member having a smooth passageway communicating with said vertical bore, ring means surrounding said spout member and closing the upper end of said vertical bore, a second block member removably fitted on the upper end of said spout member above said first named annular flange, said second block member having a smooth vertical bore with which said open upper end of said spout member communicates, a lateral flange on said second block member having a smooth passageway communicating with said last named vertical bore, an elongated rod member extending internally and axially of said spout member from its lower open end and having a head with a valve seat in engagement with said lower open end, said rod extending upwardly between said upper open end of said spout member and through an opening in said second block member and having a threaded upper end portion, a spring biasing member positioned on said spout member between said ring means and said first named annular flange for biasing said first named block member toward said head of said rod member, a sealing gasket at
said head engageable with the outer end of said tubular sheath when said biasing by said spring member occurs to provide a sealed closure of the outer open end of said sheath, removable nut means screwable onto said threaded upper end portion of said rod member for maintaining the nozzle in assembly and for permitting its ready disassembly merely by removal of said nut means, sealing means to prevent leakage from said assembly, said first-named block member being displaceable axially of said spout member against the biasing action of said spring biasing member to correspondingly displace the outer open end of said sheath and expose said outlet orifices of said spout member as well as a passageway between said sheath and said spout member.

References Cited by the Examiner

UNITED STATES PATENTS

2,574,003  11/51 Wymer 239—600 X
2,809,677  10/57 Hamner 141—59
3,025,878  3/62 Hupp 137—608 X

FOREIGN PATENTS

805,905  12/58 Great Britain.

LAVERNE D. GEIGER, Primary Examiner.