April 9, 1957 R. R. MARTIN 2,788,031

RECEPTACLE FILLING APPARATUS

Filed May 4, 1955 2 Sheets-Sheet 1

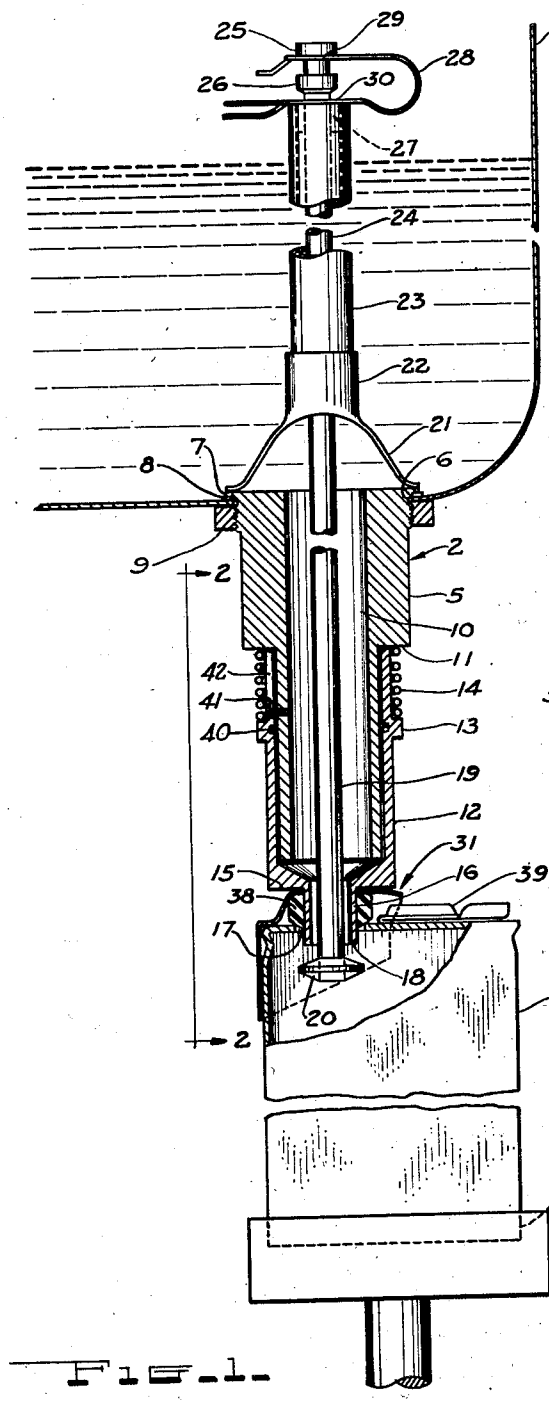


Fig. 1

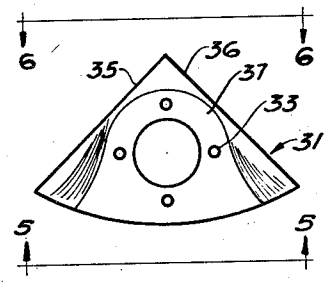


Fig. 4

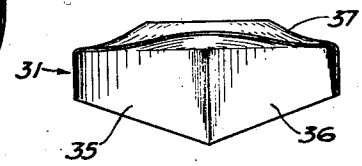


Fig. 5

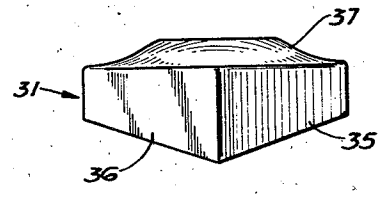


Fig. 6

INVENTOR
Raymond R. Martin.
BY Roy A. Plant
ATTORNEY

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RECEPTACLE FILLING APPARATUS

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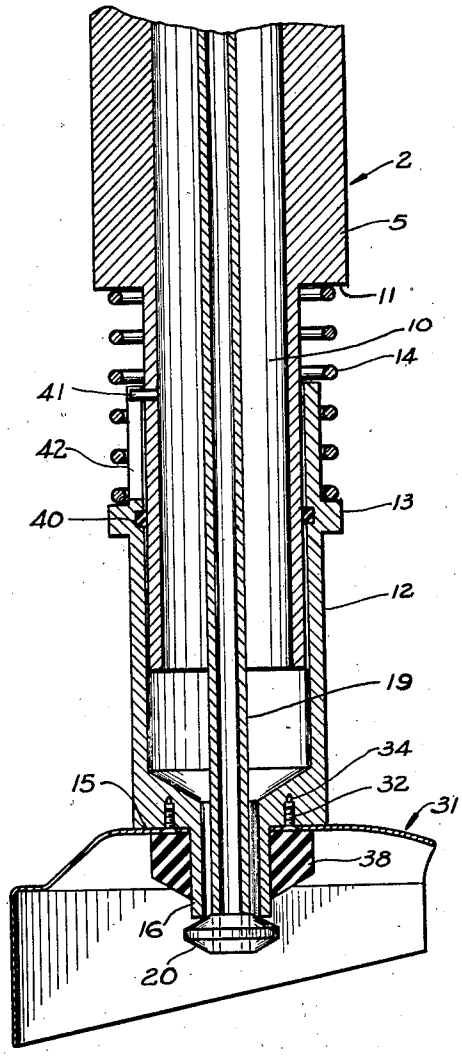


FIG. 2.

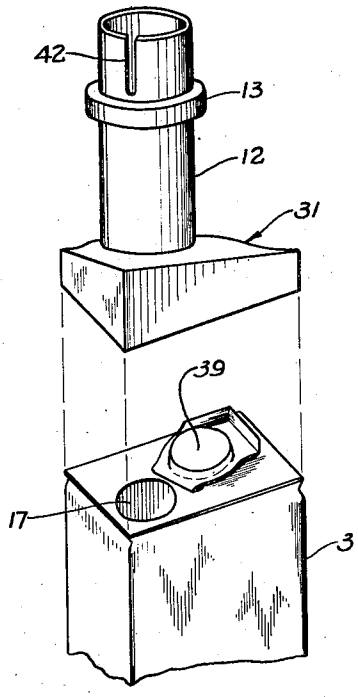


FIG. 3.

INVENTOR
Raymond R. Martin.
BY Roy A. Plant
ATTORNEY

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RECEPTACLE FILLING APPARATUS

Raymond R. Martin, Albion, Mich.

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7 Claims. (Cl. 141—295)

The present invention relates broadly to receptacle filling apparatus, and in its specific phases to apparatus for filling paper milk bottles of rectangular cross section and substantially flat ends, the upper end of which has a hinged cap for a filling opening in same.

Machines for filling glass milk bottles have long been in common use, and with the advent of paper containers for milk, such as the rectangular cross section flat ended containers made by American Can Company, special and highly expensive equipment has been devised for filling same. The reason for this is that the standard glass milk bottle is rigid and the filler member of the machine can be forced solidly against the open end of the bottle without danger of damaging or crushing it, a thing which such equipment would do with a paper milk bottle. There apparently has been no simple, low cost, equipment put on the market which would make possible converting a standard machine for filling glass milk bottles, such as the Cherry-Burrell "Six" series bottle fillers, to one for filling the flat ended rectangular cross section paper milk bottles having a hinged closure cap in its upper end, and wherein the filler member will have a portion to engage and be supported on the upper end of the paper bottle. It was a recognition of this need, and the complete lack of any commercial solution of the problem involved, which led to the conception and development of the present invention.

Accordingly among the objects of the present invention is the provision of an improved form of mlik bottle filling equipment for use with rectangular cross section paper milk bottles having substantially flat ends and a hinged filler opening cap in the upper end of same.

Another object is to provide a modified form of apparatus for engaging and resting on the upper end of a rectangular cross section paper milk bottle, with hinged filler cap in its upper end, for use in filling same without crushing said cap when the latter is in its open position.

A further object is to provide a highly simplified, low cost, and efficient apparatus for converting a standard glass milk bottle filling machine to one which will fill a rectangular paper milk bottle having substantially flat ends and a hinged filler cap in its upper end.

A further object is to provide each filler member of a milk bottle filling machine with a hood member for engaging and resting on the upper end of a rectangular cross section paper milk bottle at one corner and along the adjacent side edges, wherein said hood member has an elevated central portion to provide space for the filler opening engaging portion of said apparatus, and to protect the hinged filler opening cap from being crushed when turned back during the filling operation.

Still further objects and advantages of the invention will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the container filling means hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain means for

carrying out the invention, such disclosed means illustrating, however, but one of various ways in which the principle of the invention may be used.

In the annexed drawings:

Figure 1 shows a partially sectioned longitudinal elevational view of the mechanism of a preferred form of the improved bottle filling apparatus adapted for filling substantially flat ended rectangular cross section paper bottles.

Figure 2 shows an enlarged longitudinal cross sectional view of the apparatus as seen in the general area indicated by the line with arrows 2—2 of Figure 1, but substantially diagonally cornerwise of the upper end of the rectangular bottle.

Figure 3 shows a perspective view of the upper end of a typical rectangular cross section paper bottle with the hood member of the present invention in position to be lowered onto and supported by same.

Figure 4 shows a top view of a preferred form of hood member for use in accordance with the present invention.

Figures 5 and 6 show front and rear views of the hood member as seen at lines 5—5 and 6—6 of Figure 4, respectively, looking in the direction of the arrows.

Referring more particularly to Figure 1 of the drawings, the liquid reservoir 1 of a conventional milk container filling machine, has connected thereto, at its bottom, a series of container actuated assemblies 2 each of which is adapted to engage the upper end of a suitable container 3 which sets on an endwise movable platform member 4 having a container positioning socket 4*a*. Since this liquid reservoir with its container actuated assemblies 2 and the platform members 4 all are part of an assembly which rotates as a unit with a cam mechanism for lifting the milk container 3 at the proper time for filling same, and, aside from the special construction of the container actuated assembly 2, which will be hereinafter described in detail, are all parts of standard milk bottle filling equipment and not a part of the present invention, such overall assembly has not been illustrated. Also since the container actuated assemblies 2 are all alike and embody the present invention, only one has been illustrated in order to avoid duplication of showing and description.

The container actuated assembly 2, Figure 1, has a depending liquid dispensing or outlet tube 5 which extends through opening 6 in the bottom of liquid reservoir 1, and is provided on its upper end with an outturned flange 7 under which is provided a sealing gasket 8. The outer face of outlet tube 5 is preferably threaded for engagement by a suitable nut 9, which, when tightened, will compress gasket 8 and form a liquid tight seal. Outlet tube 5 also has a passageway 10 throughout the length of same for flow of liquid therethrough into container 3 to be filled. The lower portion of said outlet tube 5 is of reduced outside size so as to form a shoulder 11, and to receive an endwise movable sleeve 12 having an inside size closely but freely fitting said reduced size portion of outlet tube 5. If desired this sleeve 12 may be provided with a ring or sealing gasket 40 to substantially stop all leakage between the telescoped members, although with a close tolerance sliding fit, leakage is negligible even without a sealing gasket.

Sleeve 12 has a circumferential flange 13 on its outer face between its ends with said flange spaced from the upper end of said sleeve a sufficient distance for the reception of a suitable length mild compression spring 14 to facilitate functioning of the apparatus as will be hereinafter set forth. The lower end of sleeve 12 preferably has a substantially flat end portion 15 with a depending, substantially central, discharge tube 16 of a little less diameter than the filler opening 17 in container 3, with the end of the discharge tube 16 forming a valve seat 18 for a hollow, open-ended, valve 19 having a seating head

20, preferably of rubber, suitably joined thereto in conventional manner and adapted to seal on valve seat 18.

Inside of liquid reservoir 1, Figure 1, directly above outlet tube 5, and preferably mounted on outturned flange 7 thereof in conventional manner, as by welding, is a spider member 21 which may have on its upper face a socket member 22 adapted to receive the lower end of tubular member 23 through which passes, substantially co-axially, the hollow stem 24 of valve 19. That valve stem 24 is provided at its upper end with a pair of fixed location, outwardly projecting, spaced apart ring members 25 and 26 which are preferably slightly less in outside diameter than the inside diameter of tubular member 23 to facilitate assembling the apparatus. Stem 24 may also be provided with a centering sleeve member 27 spaced a short distance from ring member 26 and freely fitting the bore of tubular member 23. A hairpin shaped key member 28, made of suitable resilient thin strip stock, with bifurcated ends 29 and 30 engages the end of stem 24, as shown, above the upper end of tubular member 23 to support same for a purpose to be hereinafter set forth. If desired these bifurcated ends may have an offset portion, as shown, to avoid accidental disengagement of key member 28.

Mounted in conventional manner on the lower end of sleeve 12 is a hood member 31. This mounting is preferably accomplished through the use of flat head screws 32, Figure 2, which pass through openings 33, Figure 4, in hood member 31 and engage suitable threaded openings 34 in the lower end 15 of sleeve 12. Hood member 31 has side members 35 and 36 which depend from top member 37 which, in turn, is upwardly arched and provided with an open front which is opposite to side members 35 and 36. Arching top member 37, as shown, provides room for a gasket 38 around discharge tube 16 in position for sealing filler opening 17 in container 3 during the filling operation. This gasket 38 is preferably of natural or synthetic rubber and is also preferably of inverted conical shape just slightly longer than the depth of the arching of top member 37 of hood 31 so as to extend into and provide a satisfactory tight seal on the edges of filler opening 17 under conditions of use. The open front of the arched top 37 of the hood member 31 also allows the hinged cap 39 of container 3 to be turned back and held in that position during the filling of the container, all without crushing the cap.

Since hood member 31 must move in a linear or non-rotating path so as to always fit the corner of a container of the character described when it is presented for filling, suitable means must be provided for guiding the movement of the hood in such path. Of the various ways in which this may be accomplished a preferred one involves the use of a pin 41, Figure 2, extending outwardly from outlet tube 5 and fitting into longitudinal slot 42 in sleeve 12 so that telescoping of these two members will result in linear straight line movement of one relative to the other.

When the apparatus of the present invention is used for dispensing liquids, such as milk, it will be noted that the liquid reservoir 1 will contain the milk to be dispensed, and that it will freely flow through the open sides of spider 21 and fill the inside of outlet tube 5 and the lower portion of sleeve 12 down to the valve head 20 seating on the end of discharge tube 16, with the assembled parts in the position shown in Figure 2. Then with the paper container 3 in filling position and lifted by platform member 4 to be the position shown in Figure 1, this will lift valve seat 18 away from the seating head 20 of valve 19 to permit milk to flow into container 3. At the same time gasket 38 will be compressed slightly on the top of container 3 to seal filler opening 17 of the latter, while hood member 31 will rest on two side edges of the container at a corner of same and transmit the upward movement of same to sleeve 12 whose endwise movement compresses spring 14.

When milk flows into container 3 the displaced air in same will flow out through the hollow valve 19 which, in turn, at the end of the filling operation becomes filled with milk to the level of the top of the milk in reservoir 1. However, there is an air pocket in the upper end of the container 3 above the air inlet end of valve 19 so that when container 3 is lowered at the end of the filling operation, this lowering seals seating head 20 of valve 19 on seat 18 before the sealing pressure of gasket 38 on the upper end of container 3 is released. Further lowering of the container permits, when the seal of gasket 38 on the end of container 3 is broken, the milk in the hollow stem of valve 19 to flow into container 3 and fill same to the predetermined required level for a volume required by law, such as a quart, pint, or the like. The resilient key member 28 with its bifurcated ends absorbs part of the valve closing shock during the container lowering operation and holds the valve 19 from being pulled more than a limited small amount down into tubular member 23, and through such holding permits the seating head 20 of valve 19 to firmly seat on valve seat 18 on the lower end of discharge tube 16 and prevent further discharge of milk therethrough until the assembly is actuated by the next container brought up against the underface of hood member 31 to repeat the cycle.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a machine for filling receptacles, such as milk containers to be delivered to milk customers, and which has a liquid supply reservoir together with means for positioning and lifting a container to filling position and lowering same after filling, the combination therewith of a container actuated assembly which comprises an outlet tube extending downwardly from the bottom of said supply reservoir, a sleeve telescopically fitting said outlet tube in substantially fluid tight manner, a mild compression spring, means on said outlet tube and on said sleeve for engaging said spring in manner such that said sleeve is normally extended by said spring partially off from said outlet tube, a discharge outlet tube extending from the lower end of said sleeve and adapted to enter the filling opening of said container, a vented valve extending all the way through said discharge outlet tube and having its upper end above the top of the liquid in said liquid supply reservoir, said valve sealing the outlet end of said discharge outlet tube, said valve having a head and stem having an unobstructed passageway therethrough, said head acting as a stop which seals on the end of the discharge outlet tube of said sleeve when the latter is in its normally extended position, a hood means mounted on the lower end portion of said sleeve, said hood means being adapted to engage the top of said container to be filled and when said container is raised, after engagement with said hood means, the latter acts to compress said spring and open said valve which allows fluid to flow through said outlet tube, sleeve, and discharge outlet tube into said container from said supply reservoir, and a gasket within said hood and around said discharge outlet tube, said gasket sealing the filling opening in said container when said hood means is in engagement with the top of said container.

2. In a receptacle filling apparatus as set forth in claim 1, wherein same is adapted for filling said containers when they are substantially flat ended and of rectangular cross-section, and wherein said hood means is adapted to fit the upper end of said container at one corner thereof and be supported principally on the side edges of same which terminate at said corner, and wherein said vented valve means has its head within said hood and has a resilient supporting means for its upper end.

3. In a machine for filling receptacles, such as milk containers, and which has a liquid supply reservoir together with means for positioning and lifting a container to filling position and lowering same after filling, the combination therewith of a container actuated assembly which combines an outlet tube extending downwardly from the bottom of said supply reservoir, a sleeve telescopically fitting said outlet tube in substantially fluid tight manner, a mild compression spring, means on said outlet tube and on said sleeve for engaging said spring in manner such that said sleeve is normally extended by said spring partially off from said outlet tube, a discharge outlet tube extending from the lower end of said sleeve and adapted to enter the filling opening of said container, a vented valve for sealing the outlet end of said discharge outlet tube and acting as a stop for said sleeve when the latter is in its normally extended position, a hood means mounted on the lower end portion of said sleeve, said hood means being adapted to engage the top of said container to be filled and when said container is raised, after engagement with said hood means, the latter acts to compress said spring and open said valve which allows fluid to flow through said outlet tube, sleeve, and discharge outlet tube into said container from said supply reservoir, and a gasket within said hood and around said discharge outlet tube, said gasket sealing the filling opening in said container when said hood means is in engagement with the top of said container, wherein such apparatus is adapted for filling substantially flat ended rectangular cross-section paper containers having a filling opening in the upper end of same adjacent one corner with a hingedly mounted cap for closing said opening, and wherein said hood means is adapted to fit the upper end of said container at one corner thereof and be supported on the side edges of the container which terminate at said corner, said hood means having an elevated central portion open at its front to provide room for the hingedly mounted cap of said container when said cap is turned back during the filling operation.

4. In a receptacle filling apparatus as set forth in claim 1, wherein said compression spring supporting means consists of an outwardly projecting shoulder on the outlet tube for supporting the upper end of said spring, and an outwardly projecting shoulder means on said sleeve for supporting the lower end of said spring, and wherein said hood means has an elevated central portion open at its front in elevated position and which hood means is fixedly joined on the lower end of said sleeve with said gasket fastened in the elevated central portion of said hood, and further wherein means is provided for guiding said hood in a non-rotary fixed endwise reciprocating movement path.

5. In a machine for filling receptacles, such as milk containers, and which has a liquid supply reservoir together with means for positioning and lifting a container to filling position and lowering same after filling, the combination therewith of a container actuated assembly which combines an outlet tube extending downwardly from the bottom of said supply reservoir, a sleeve telescopically fitting said outlet tube in substantially fluid tight manner, a mild compression spring, means on said outlet tube and on said sleeve for engaging said spring in manner such that said sleeve is normally extended by said spring partially off from said outlet tube, a discharge outlet tube extending from the lower end of said sleeve and adapted to enter the filling opening of said container, a vented valve for sealing the outlet end of said discharge outlet tube and acting as a stop for said sleeve when the latter is in its normally extended position, a hood means mounted on the lower end portion of said sleeve, said hood means being adapted to engage the top of said container to be filled and when said container is raised, after engagement with said hood means, the latter acts to compress said spring and open said valve which allows fluid to flow through said outlet tube, sleeve, and discharge outlet tube into said container from said supply reservoir, and a gasket within said hood and around said discharge outlet tube, said gasket sealing the filling opening in said container when said hood means is in engagement with the top of said container, wherein such apparatus is adapted for filling substantially flat ended rectangular cross-section paper containers having a filling opening in the upper end of same adjacent one corner, with a hingedly mounted cap for closing said opening, wherein means is provided for guiding said hood in a non-rotary fixed endwise reciprocating movement path, and wherein said hood means is adapted to fit the upper end of said container at one corner thereof and be supported on the side edges of the container which terminate at said corner, said hood means having an elevated central portion open at its front to provide room for the hingedly mounted cap of said container when said cap is turned back during the filling operation.

6. In a receptacle actuated mechanism for a receptacle filling machine, which comprises a fluid discharge tube, a hood member through which said discharge tube extends, means for fixedly connecting said hood member and discharge tube for endwise movement in unison, means for guiding said hood for linear non-rotating endwise movement, valve means for said discharge tube, said valve means closing said discharge tube when the latter is in its normal extended position and opening same when said discharge tube is retracted, said hood means having an elevated central portion and side edges adapted to engage the end of a receptacle to be filled while said discharge tube extends into said receptacle through a suitable filler opening therein, and a gasket inside of said hood, said gasket sealing said filler opening around said fluid discharge tube when the side edges of said hood are engaged by said receptacle and moved by the latter so as to retract said discharge tube and open said valve.

7. In a receptacle actuated mechanism as set forth in claim 6, wherein said mechanism is adapted to fill rectangular cross-section paper containers having substantially flat ends with the upper end having a filler opening at one corner and a hinged closure member for same, said hood member having depending side members adapted to lie at the sides of said container adjacent said filling opening corner of same in position to stiffen said hood, with the side of said hood opposite to said depending side members being open to provide room for the hingedly mounted cap of said container when said cap is turned back during the filling operation.

References Cited in the file of this patent

UNITED STATES PATENTS

2,167,894	Kotcher	Aug. 1, 1939
2,330,596	Kotcher	Sept. 28, 1943