March 29, 1955 E. J. SLATTERY 2,705,102

AUTOMATIC FILLING NOZZLE

Filed Feb. 27, 1951 2 Sheets-Sheet 1

Fig. 1

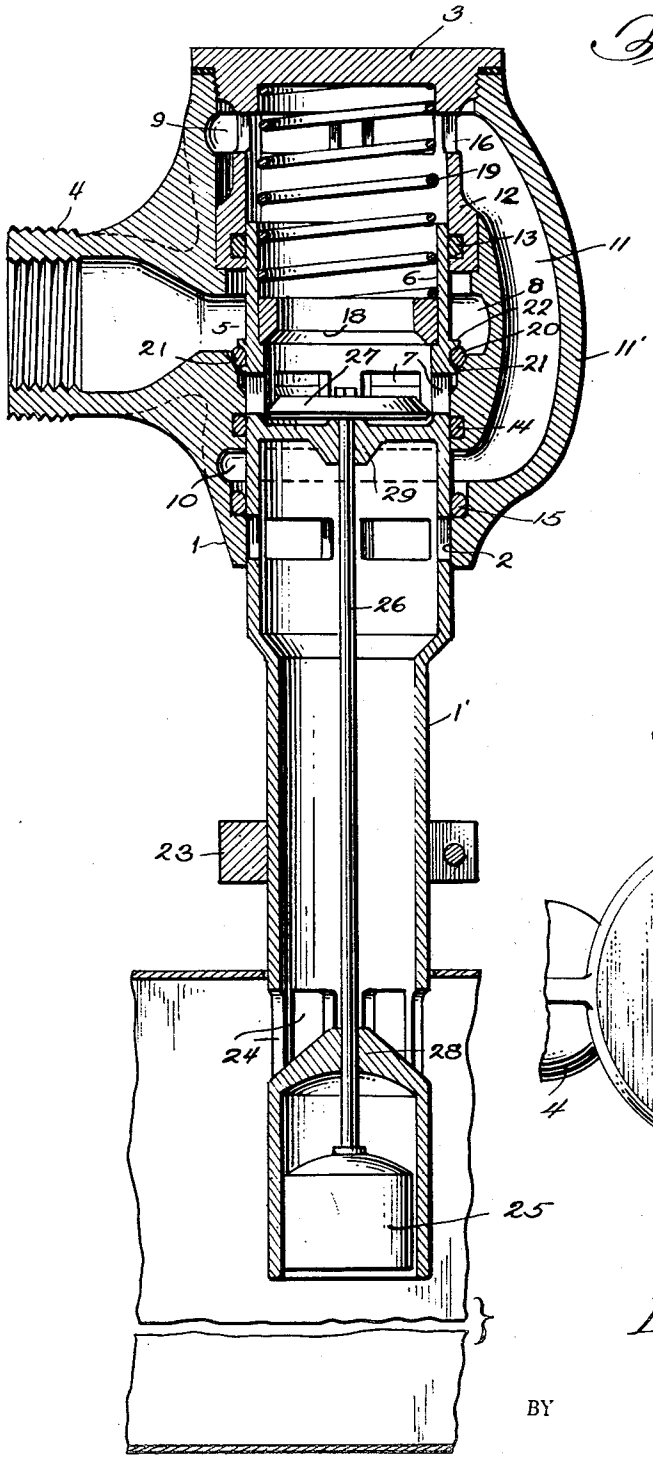

Fig. 2

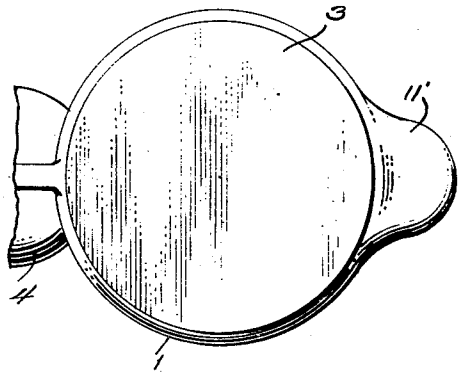

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Fig. 3

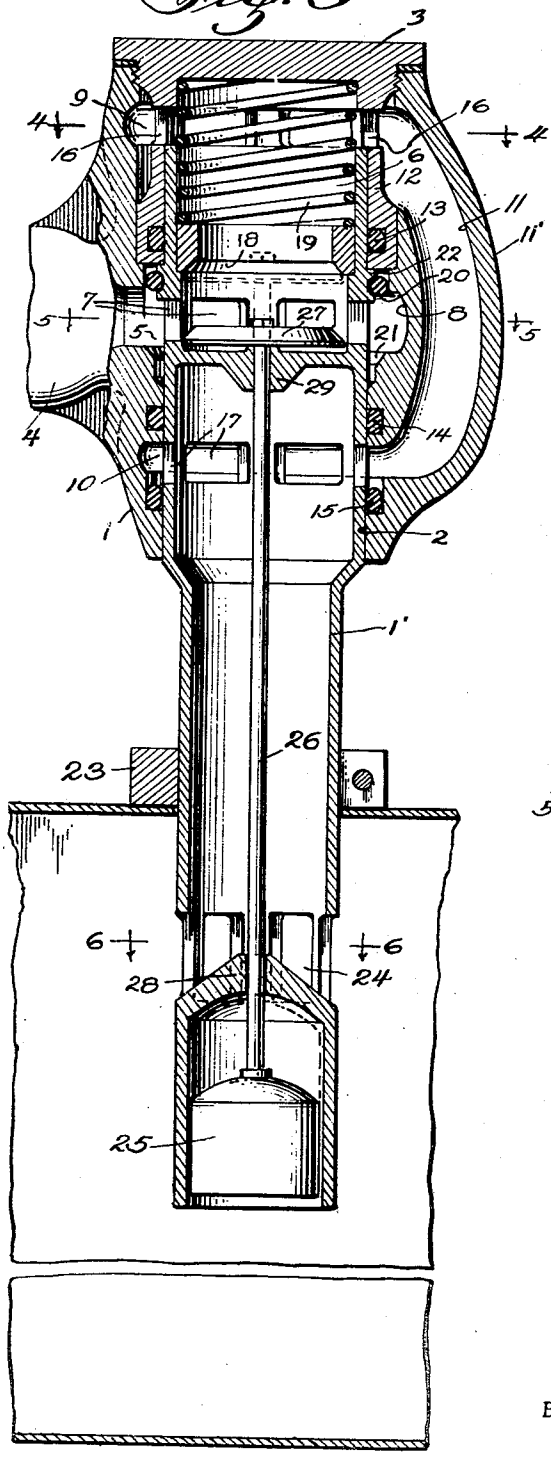


Fig. 4

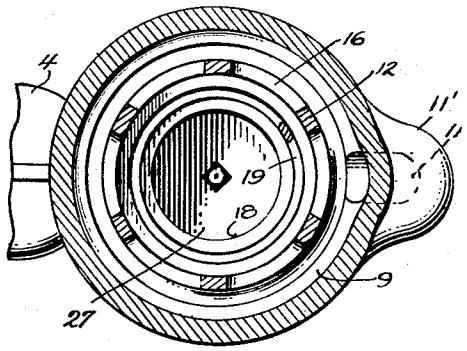


Fig. 5

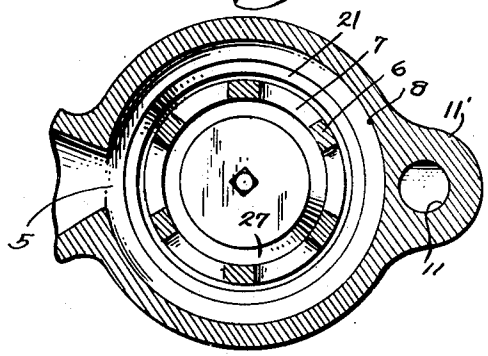
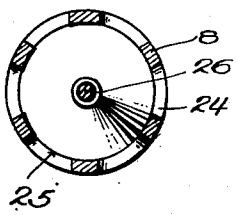


Fig. 6



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AUTOMATIC FILLING NOZZLE

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Application February 27, 1951, Serial No. 213,034

11 Claims. (Cl. 226—127)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

The present invention relates to nozzles for dispensing gasoline and other liquids and has for its general object to provide an integrated construction of nozzle which is automatically opened when the nozzle is placed in a receptacle to be filled, and automatically closed when the liquid reaches a predetermined level in the receptacle being filled.

A further object of the invention resides in the provision of an automatic nozzle which is composed of only a few movable elements and which elements are of strong and sturdy construction.

A still further object of the invention consists in the construction of an automatic nozzle in which the parts are so arranged as to reduce wear and tear to a minimum.

Another object of the invention consists in the provision of an automatic nozzle including an articulated sleeve valve and poppet valve each of which is automatically operated to control the flow of liquid through the nozzle.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, in which,

Figure 1 is a longitudinal sectional view through the improved dispensing nozzle showing the same in closed position;

Figure 2 is a plan view thereof;

Figure 3 is a longitudinal sectional view similar to Figure 1 but showing the sleeve valve in open position and the float valve closed in dotted outline; and

Figures 4, 5 and 6 are transverse sectional views taken on the lines 4—4, 5—5 and 6—6, respectively, of Figure 3.

More specifically, the numeral 1 indicates the body portion of the dispensing nozzle provided with a substantially cylindrical interior 2 which is open at its upper end and adapted to be closed by a threaded closure 3 which permits access to the interior of the body portion. The casing is provided with a nipple 4 for the reception of one end of a hose extending from the source of supply, and an inlet opening 5 to the cylindrical interior tube of the casing.

Slidably mounted in the interior of the casing 1 is a sleeve valve 6 provided with an annular series of openings 7 adapted to cooperate with the inlet 5 when the sleeve valve is in open position, and also with an annular groove 8 formed in the body portion of the nozzle intermediate its end. The lower end of the sleeve valve 6 is provided with a tubular extension or nozzle tube 1' which is shown as integrally formed with the sleeve valve and is movable therewith as a unit.

The cylindrical interior of the body portion of the nozzle is provided, in the present illustration, with upper and lower annular grooves 9 and 10 connected by a vertical passage 11 formed in an enlargement or protuberance 11' of the body portion of the nozzle. The sleeve valve 6 is guided in its vertical movement at the upper end of the body portion of the nozzle by means of a bushing 12 provided with an inwardly directed gasket 13 for sealing the same, and the lower end of the sleeve valve has its bearing on the inner face of the body portion itself, such inner face being provided with inwardly directed seats for gaskets 14 and 15 for sealing off the valve.

The bushing 12 extends to the upper end of the interior of the nozzle casing and is provided with an annular series of ports 16 communicating with the recess 9 and the vertical passageway 11. Likewise, the lower portion of the sleeve valve is provided with an annular series of ports 17 which communicate with the annular groove 10 in the lower portion of the body of the nozzle and with the lower end of the vertical passageway 11. Adjacent its upper end the sleeve valve 6 is provided with a downwardly directed valve seat 18 for a purpose to be hereinafter described.

Engaging the upper edge of the ring in which the valve seat 18 is formed is a compression spring 19 having its upper end seated against the under surface of the closure 3. This spring, of course, serves to bias the sleeve valve 6 downwardly, and such downward movement is limited by the engagement of a gasket 20 with its seat 21 formed in the body portion of the nozzle. Upward movement of the sleeve valve is limited by a shoulder 22 formed on the external wall of the valve and adapted to engage the lower end of bushing 12, and the length of the sleeve valve is such that when moved to its upper position its upper end will lie flush with the lower edge of the annular series of ports 16, as indicated in Figure 3.

From the structure so far described, it will be apparent that when the sleeve valve 6 is moved to its closed position by the spring 19, the inlet passage 5 is closed as indicated in Figure 1, and the lower end of the vertical passage 11 is also closed. On the other hand, when the sleeve valve 6 is moved upwardly against the pressure of spring 19, in a manner to be hereinafter described, the series of ports 7 will align with the annular groove 8 and the inlet 5 so as to permit the passage of liquid upwardly through the sleeve valve to the annular series of ports 16, grooves 9, vertical passage 11, circular groove 10 and annular series of ports 17, and thence to the tubular extension or nozzle tube 1'.

Adjustably mounted on the exterior of the nozzle section 1' is a band or ring 23 which is adapted to engage a wall of a receptacle to be filled and into which the nozzle tube 1' is projected. A portion of such a receptacle is indicated in Figure 3. The nozzle tube 1' is provided adjacent its lower end with an annular series of ports 24 through which the liquid passing downwardly through the tube is directed to the interior of the receptacle. In the present illustration, a float 25 is mounted in the extreme lower end of the tube 1' and is connected to the lower end of a valve stem 26. This valve stem is connected at its upper end to a poppet valve 27 adapted to cooperate with the downwardly directed valve seat 18 heretofore referred to, and the valve stem and valve are guided in their vertical movement by centrally apertured partitions 28 and 29 disposed directly below the ports 24 and 17 formed in the combined sleeve valve and nozzle tube 6—1'. The parts 25 and 27 together form a float valve, and when the float is raised to the dotted line position indicated in Figure 3, by the fluid rising in the receptacle to be filled, the valve 27 will engage its seat 18, also as shown in dotted lines in Figure 3, and thus shut off the flow of liquid upwardly through the sleeve valve 6 to the series of ports and passageways leading to the interior of the nozzle tube 1'. It will be apparent, of course, that by adjusting the vertical position of the ring 23 along the length of the tube 1', the amount of fluid allowed to enter a receptacle may be varied as desired.

The operation of the various parts have been described in connection with the description of the structure and need not be repeated, except to the extent of pointing out that I have provided an integrated construction formed of only a few movable parts; that such parts are all enclosed within the structural features of the nozzle itself and are therefore guarded against rough usage; that the movable parts are so designed and articulated as to reduce wear and tear to a minimum; and yet this simplified construction produces an automatic dispensing nozzle which is automatically opened for discharge when the nozzle tube 1' is projected into a receptacle to be filled, and it is automatically closed when the level of the liquid entering the receptacle reaches a predetermined height.

In accordance with the patent statutes, I have described what I now consider to be the preferred form of the auto-

matic dispensing nozzle, but since various changes may be made in structural details without departing from the spirit of the invention, it is intended that all such variations be included within the scope of the appended claims.

I claim:

1. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with a laterial inlet, said body portion provided with a passageway at one side of the cylindrical interior and communicating with the upper and lower ends thereof, a sleeve valve in said body portion provided with apertures capable of registering with said inlet and the lower end of the passageway, and a spring for normally maintaining said sleeve in closed position.

2. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with a lateral inlet, an annular groove formed adjacent the top and the bottom of the cylindrical interior, a vertical passageway at one side of the cylindrical interior and connecting said grooves, a spring-pressed sleeve valve slidably mounted in the body portion and provided with an opening normally out of register with the inlet, and a nozzle tube on said sleeve extending beyond the body portion.

3. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with a lateral inlet, said body portion provided with a passageway at one side of the cylindrical interior and communicating with the upper and lower ends thereof, a sleeve valve in said body portion provided with apertures capable of registering with said inlet and the lower end of the passageway, a spring for normally maintaining said sleeve valve in closed position, and a nozzle tube on said sleeve valve extending beyond said body portion.

4. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with a lateral inlet, said body portion provided with a passageway at one side of the cylindrical interior and communicating with the upper and lower ends thereof, a sleeve valve in said body portion provided with apertures capable of registering with said inlet and the lower end of the passageway, a spring for normally maintaining said sleeve valve in closed position, a nozzle tube on said sleeve valve extending beyond said body portion, and means on said tube adapted to be engaged by a receptacle to be filled.

5. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a spring-pressed sleeve valve mounted in the body portion for controlling said inlet and adapted to be opened by engagement with a container, and a float-controlled poppet valve mounted on the interior of the sleeve valve for controlling said inlet.

6. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a spring-pressed sleeve valve mounted in the body portion for controlling said inlet and adapted to be opened by engagement with a container, a nozzle tube on said sleeve valve extending beyond the body portion, a normally open poppet valve mounted within said sleeve valve, and a valve stem and float connected to the poppet valve extending into said nozzle tube.

7. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a spring-pressed sleeve valve normally closing said inlet and provided with an opening normally disposed below said inlet and adapted to be moved into register therewith, an annular valve seat on the interior of the sleeve valve and normally disposed below said inlet, a poppet valve reciprocably mounted in the sleeve valve and normally spaced below said annular seat, and a float for raising said poppet valve to its seat.

8. An automatic dispensnig nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a spring-pressed sleeve valve normally closing said inlet and provided with an opening normally disposed below said inlet and adapted to be moved into register therewith, an annular valve seat on the interior of the sleeve valve and normally disposed below said inlet, a poppet valve reciprocably mounted in the sleeve valve and normally spaced below said annular seat, a float for raising said poppet valve to its seat, and a nozzle tube conected to the lower end of the sleeve valve and extending below the body portion of the nozzle.

9. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a spring-pressed sleeve valve normally closing said inlet and provided with an opening normally disposed below said inlet and adapted to be moved into register therewith, an annular valve seat on the interior of the sleeve valve and normally disposed below said inlet, a poppet valve reciprocably mounted in the sleeve valve and normally spaced below said annular seat, a float for raising said poppet valve to its seat, a nozzle tube connected to the lower end of the sleeve valve and extending below the body portion of the nozzle, and means on said tube adapted to be engaged by a receptacle to be filled.

10. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a nozzle tube slidably mounted in said body portion, means connected with the inner end of the tube for controlling said inlet, and a float-controlled poppet valve mounted in said tube and body portion for also controlling said inlet.

11. An automatic dispensing nozzle, comprising a body portion having a cylindrical interior and provided with an inlet, a nozzle tube slidably mounted in said body portion, and a sleeve valve and a float-operated-poppet valve connected with the inner end of the tube for controlling said inlet under varying conditions.

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