Dec. 11, 1934. E. W. SHUGART ET AL 1,983,820

NOZZLE

Filed Jan. 20, 1934

Fig. 1.

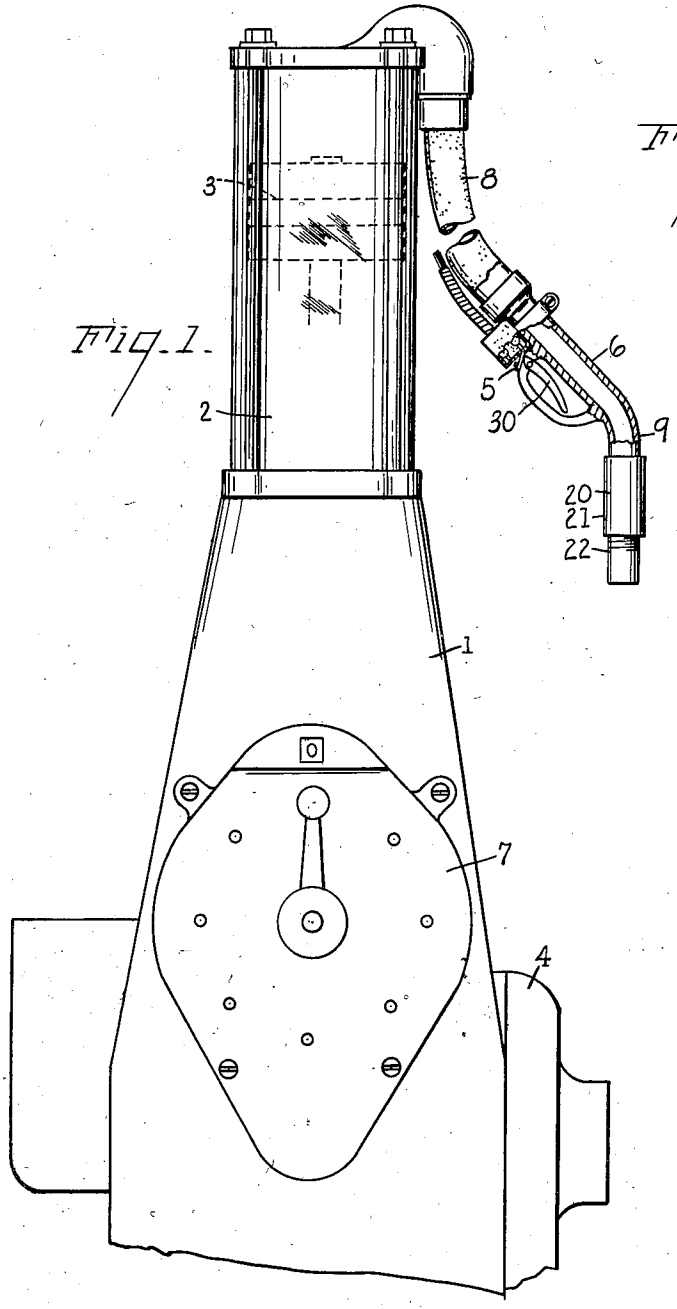
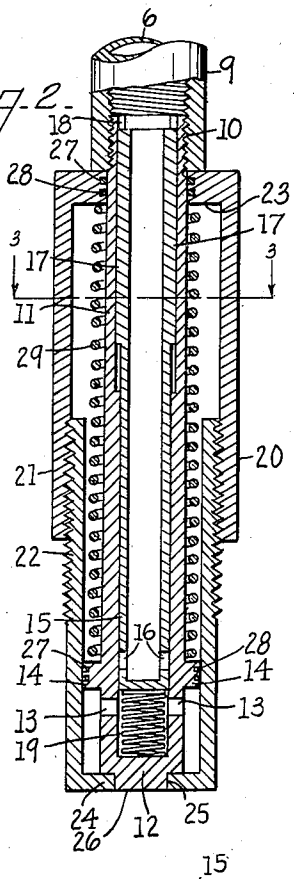


Fig. 2.



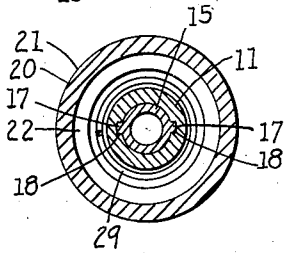


Fig. 3.

BY

INVENTORS
Ernest W. Shugart
Henry Van Dam
Chappell & Earl
ATTORNEYS

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1,983,820

NOZZLE

Ernest W. Shugart, Kalamazoo Township, Kalamazoo County, and Henry Van Dam, Kalamazoo, Mich.

Application January 20, 1934, Serial No. 707,524

11 Claims. (Cl. 221—100)

This invention relates to nozzles provided with automatic check valves for use with dispensing pumps of the type disclosed by the copending application of Ernest W. Shugart, Serial No. 667,177, filed April 21, 1933.

The main objects of our invention are:

First, to provide an improved nozzle having check valve means automatically responsive to internal pressure and controlled thereby and which can be opened only with difficulty so that unauthorized operation is avoided.

Second, to provide a piston valved nozzle of this character which is simple and economical in its parts, and efficient and effective in operation.

Further objects relating to details and economies of our invention will appear from the description to follow. A structure which is a preferred embodiment of our invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary view in side elevation of a dispensing pump provided with a nozzle embodying the features of our invention.

Fig. 2 is an enlarged fragmentary section of the nozzle.

Fig. 3 is a transverse section on line 3—3 of Fig. 2.

The parts are identified by their numerals of reference which are the same throughout the several views.

Referring to the drawing, 1 is an oil pump provided with a transparent cylinder 2 for the piston 3, the latter being reciprocated by the motor 4. The energizing circuit of the motor 4 includes the manually operable switch 5 on the nozzle 6 and a supervisory control 7 by means of which the pump can be set to deliver a predetermined quantity of oil to the nozzle through the operation of the piston 3. The details of such supervisory control are disclosed and claimed in the copending application of Henry Van Dam filed concurrently herewith and also in the aforesaid patent application. The pump is adapted to deliver a fixed quantity of fluid such as a quart on each advance stroke of the piston. Such quantity is predicated upon the connections between the nozzle 6 and the cylinder 2, such as the hose 8, being full of the fluid prior to the beginning of the advance stroke of the piston.

To insure the connections being full, we provide an improved nozzle which is automatically responsive to the pressure of the fluid in the system, but which prevents unauthorized or surreptitious draining of the hose 8 without disassembling the same. Our improved nozzle comprises a curved neck 9 terminating in an internally threaded end 10. An elongated cylindrical head 11 is threaded into the end of the neck, the outer end of the head being closed as indicated at 12. The head is provided with opposed wall ports 13, 13 spaced from its outer end and below the annular external bearing flange 14.

An elongated cylindrical cup 15 fits within the head for reciprocating longitudinal movement and is provided with opposed wall ports 16, 16 for registry with the wall ports in the head when the cup is actuated to its fully advanced position. Such position is determined by the coaction of the inner ends of the opposed longitudinal tongues 17, 17 on the cup with those of the opposed longitudinal grooves 18, 18 in the head 11, the grooves and tongues extending inwardly from the inner ends of the parts and terminating medially thereof. This arrangement prevents relative rotative movement of the parts without interfering with their longitudinal movement except to limit the same as pointed out above. A cup retracting compression spring 19 is disposed between the bottom of the cup and the bottom of the head to urge the cup inwardly to close the wall ports thereof, as clearly illustrated by Fig. 2.

The head 11 is encased in a sleeve 20 comprising an inner cylindrical member 21 and an outer cylindrical member 22 threaded therein. The inner cylindrical member 21 has an annular internal bearing flange 23 at its inner end coacting with the head and abutting the end of the neck 9. The outer cylindrical member has an internal flange 24 at its outer end abutting the outer end 12 of the head and providing an end port 25 fittingly receiving the outer end projection 26 of said head.

The bearing flanges 23 and 14 are provided with annular grooves 27 for the sealing rings or gaskets 28. Such rings act to prevent the leakage of oil without interfering with the relative movement of the parts.

A sleeve retracting compression spring 29 is arranged on the head 11 within the sleeve 20 between the external bearing flange 14 of the head and the internal bearing flange 23 at the inner end of the inner sleeve member 21 for urging the sleeve inwardly of the head to close the end port 25 thereof.

With the parts arranged in this manner, when the manually operable lever 30 is grasped with the neck 9, the switch 5 is closed, which results in the operation of the motor 4. The motor elevates the piston 3 and supplies the fluid through the hose 8 to the neck 9 with sufficient pressure to first actuate the cup 11 against the force of

its retracting spring 19 to register its wall ports 16, 16 with the wall ports 13, 13 in the head 11 and second to actuate the sleeve 20 against the force of its retracting spring 29 to open its outer end port 25 through which the fluid, in this case oil, is finally ejected from the nozzle 6. The number of strokes made by the piston 3 is controlled by the supervisory control 7 as pointed out above. Inasmuch as the latter forms no part of the present invention, it is not described in detail here, but reference is made above to a copending application covering this feature.

With our improved dispensing nozzle, it is difficult for an unauthorized person or a dishonest attendant to surreptitiously drain the oil from the hose 8 by manipulating the nozzle. In prior nozzles, such as those using simple check valves, it was possible for a dishonest attendant to drain the hose to which the nozzle was attached by unseating the check valve through the discharge opening in the outer end of the nozzle. With our improved nozzle, such improper manipulation is obviated by virtue of the inner cup 15 which is responsive only to the fluid pressure within the system. Referring to Fig. 2, it will be seen that the unseating of the closure 26 from the port 25 will not result in the draining of the hose, because the ports 16 of the internal cup 15 must register with the parts 13 of the head 11 before oil is delivered to the port 25. It is very difficult to manipulate the cup 15 without completely disassembling the nozzle. A full hose is thus assured at the time of each operation and the customer receives full measure as indicated by the strokes of the piston 3 through the transparent cylinder 2.

Various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of our invention without departing from the spirit thereof. We desire to claim the invention specifically and broadly as provided in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A nozzle comprising in combination, a support terminating in an internally threaded end, an elongated cylindrical head threaded into the end of said support and having an outer end projection of reduced diameter, opposed wall ports spaced from its outer end, an annular external bearing flange spaced above said ports, and opposed internal longitudinal grooves extending inwardly from its inner end and terminating medially thereof, an elongated cylindrical cup fitting within said head for reciprocating longitudinal movement and having opposed wall ports for registry with the wall ports in said head, and opposed external longitudinal tongues extending inwardly from its inner end for coaction with the grooves in said head to prevent relative rotative movement between the head and cup and to limit the outward travel of the cup relative to the head, a cup retracting compression spring disposed between the bottom of the cup and the bottom of the head to urge the cup inwardly of the head to cover the wall ports thereof, a sleeve comprising an inner cylindrical member having an annular internal bearing flange at its inner end coacting with said head and abutting the end of said support, and an outer cylindrical member threaded within said inner member and having an internal flange at its outer end abutting the outer end of said head and providing an end port fittingly receiving the outer end projection of said head, a sleeve retracting compression spring arranged on said head within said sleeve between the external bearing flange of said head and the internal bearing flange at the inner end of said inner sleeve member for urging said sleeve inwardly of said head to close the end port of said head, and manually regulatable means for supplying fluid to said support under sufficient pressure to first actuate said cup against the force of its retracting spring to register its wall ports with the wall ports in said head and second to actuate said sleeve against the force of its retracting spring to open its outer end port through which the fluid is finally ejected from the nozzle.

2. A nozzle comprising in combination, a support, an elongated cylindrical head threaded into the end of said support and having an outer end projection of reduced diameter, opposed wall ports spaced from its outer end, and an annular external bearing flange spaced above said ports, an elongated cylindrical cup fitting within said head for reciprocating longitudinal movement and having opposed wall ports for registry with the wall ports in said head, a cup retracting compression spring disposed between the bottom of the cup and the bottom of the head to urge the cup inwardly of the head to cover the wall ports thereof, a sleeve comprising an inner cylindrical member having an annular internal bearing flange at its inner end coacting with said head, and an outer cylindrical member threaded within said inner member and having an internal flange at its outer end abutting the outer end of said head and providing an end port fittingly receiving the outer end projection of said head, a sleeve retracting compression spring arranged between the external bearing flange of said head and the internal bearing flange at the inner end of said inner sleeve member for urging said sleeve inwardly of said head to close the end port of said head, and manually regulatable means for supplying fluid to said support under sufficient pressure to first actuate said cup against the force of its retracting spring to register its wall ports with the wall ports in said head and second to actuate said sleeve against the force of its retracting spring to open its outer end port through which the fluid is finally ejected from the nozzle.

3. A nozzle comprising in combination, a support, an elongated cylindrical head threaded into the end of said support and having an outer end projection of reduced diameter, opposed wall ports spaced from its outer end, and an annular external bearing flange spaced above said ports, an elongated cylindrical cup fitting within said head for reciprocating longitudinal movement and having opposed wall ports for registry with the wall ports in said head, a cup retracting compression spring disposed between the bottom of the cup and the bottom of the head to urge the cup inwardly of the head to cover the wall ports thereof, a sleeve comprising an inner cylindrical member having an annular internal bearing flange at its inner end coacting with said head, and an outer cylindrical member threaded within said inner member and having an internal flange at its outer end abutting the outer end of said head and providing an end port fittingly receiving the outer end projection of said head, and a sleeve retracting compression spring arranged between the external bearing flange of said head and the internal bearing flange at the inner end of said

inner sleeve member for urging said sleeve inwardly of said head to close the end port of said head.

4. A nozzle comprising in combination, an elongated cylindrical head having an outer end projection of reduced diameter, opposed wall ports spaced from its outer end, an annular external bearing flange spaced above said ports, and opposed internal longitudinal grooves extending inwardly from its inner end and terminating medially thereof, an elongated cylindrical cup fitting within said head for reciprocating longitudinal movement and having opposed wall ports for registry with the wall ports in said head, and opposed external longitudinal tongues extending inwardly from its inner end for coaction with the grooves in said head to prevent relative rotative movement between the head and cup and to limit the outward travel of the cup relative to the head, a cup retracting compression spring disposed between the bottom of the cup and the bottom of the head to urge the cup inwardly of the head to cover the wall ports thereof, a sleeve having an annular internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port fittingly receiving the outer end projection of said head, and a sleeve retracting compression spring arranged on said head within said sleeve between the external bearing flange of said head and the internal bearing flange at the inner end of said inner sleeve member for urging said sleeve inwardly of said head to close the end port of said head.

5. A nozzle comprising in combination, an elongated cylindrical head having an outer end projection of reduced diameter, wall ports spaced from its outer end, an annular external bearing flange spaced above said ports, and opposed internal longitudinal grooves extending inwardly from its inner end and terminating medially thereof, an elongated cylindrical cup fitting within said head for reciprocating longitudinal movement and having wall ports for registry with the wall ports in said head, and opposed external longitudinal tongues extending inwardly from its inner end for coaction with the grooves in said head to prevent relative rotative movement between the head and cup and to limit the outward travel of the cup relative to the head, a cup retracting spring acting to urge the cup inwardly of the head to cover the wall ports thereof, a sleeve having an annular internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port fittingly receiving the outer end projection of said head, and a sleeve retracting spring for urging said sleeve inwardly of said head to close the end port of said head.

6. A nozzle comprising in combination, a cylindrical head having wall ports spaced from its outer end, and an annular external bearing flange spaced above said ports, a cylindrical cup fitting within said head for reciprocating longitudinal movement and having wall ports for registry with the wall ports in said head, and means acting to prevent relative rotative movement between the head and cup and to limit the outward travel of the cup relative to the head, a cup retracting spring acting to urge the cup inwardly of the head to cover the wall ports thereof, a sleeve having an annular internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port, and a sleeve retracting spring for urging said sleeve inwardly of said head to close the end port of said head.

7. A nozzle comprising in combination, a head having a wall port spaced from its outer end, and an external bearing flange spaced above said port, a cup fitting within said head for reciprocating longitudinal movement and having a wall port for registry with the wall port in said head, a cup retracting compression spring disposed between the bottom of the cup and the bottom of the head to urge the cup inwardly of the head to cover the wall port thereof, a sleeve having an internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port, and a sleeve retracting compression spring arranged on said head within said sleeve between the external bearing flange of said head and the internal bearing flange at the inner end of said inner sleeve member for urging said sleeve inwardly of said head to close the end port of said head.

8. A nozzle comprising in combination, a head having a wall port spaced from its outer end, and an external bearing flange spaced above said port, a cup fitting within said head for reciprocating longitudinal movement and having a wall port for registry with the wall port in said head, a cup retracting spring, a sleeve having an internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port, and a sleeve retracting spring.

9. A nozzle comprising in combination, a head having a wall port spaced from its outer end, and an external bearing flange spaced above said port, a cup fitting within said head for reciprocating longitudinal movement and having a wall port for registry with the wall port in said head, a cup retracting spring, and means for actuating said ports to control the discharge.

10. A nozzle comprising in combination, a head having a wall port spaced from its outer end, and an external bearing flange spaced above said port, a sleeve having an internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port, and a sleeve retracting spring.

11. A nozzle comprising in combination, a head having a wall port spaced from its outer end, and an external bearing flange spaced above said port, a sleeve having an internal bearing flange at its inner end coacting with said head and an internal flange at its outer end abutting the outer end of said head and providing an end port.

ERNEST W. SHUGART.
HENRY VAN DAM.