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B. J. PEPPER

AUTOMATIC SHUT-OFF NOZZLE

Filed Feb. 11, 1921

Fig. 1.

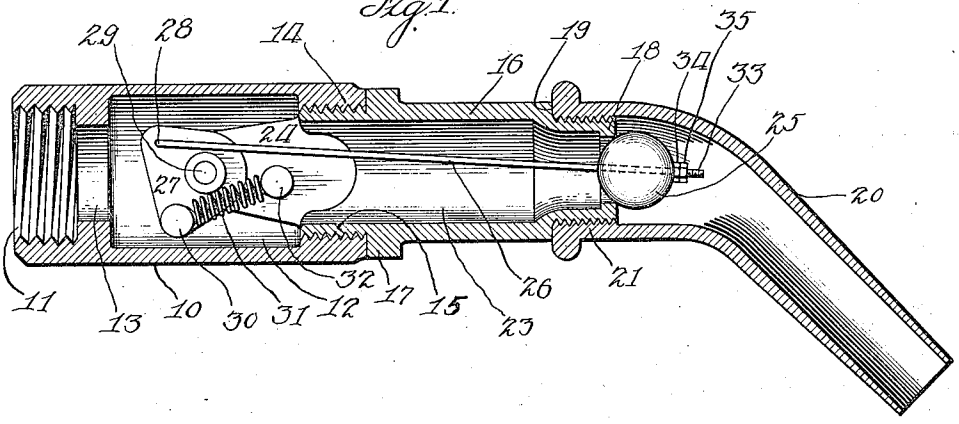
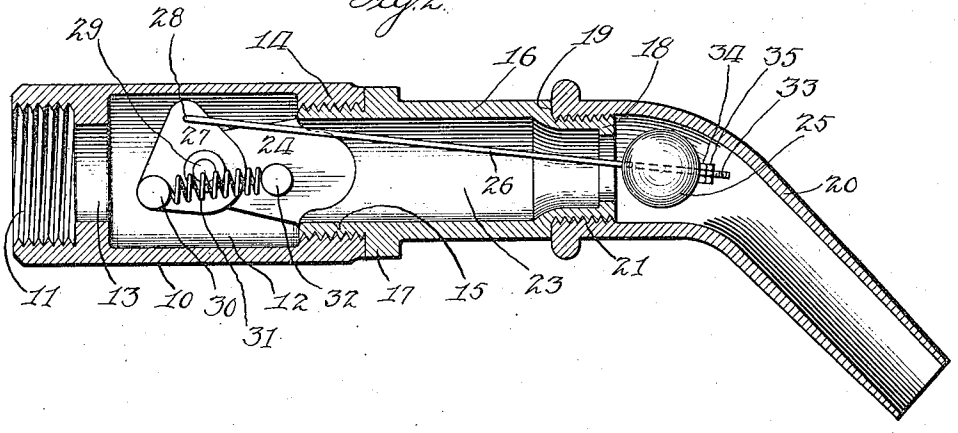


Fig. 2.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SHUT-OFF NOZZLE.

Application filed February 11, 1921. Serial No. 444,070.

To all whom it may concern:

Be it known that I, BYRON J. PEPPER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Automatic Shut-Off Nozzles, of which the following is a specification.

The invention relates to improvements in automatic shut off nozzles and it is the primary object of the invention to provide a shut off nozzle that shall be automatic in its action and adapted particularly for use with dispensing apparatus handling comparatively heavy or viscous fluids such as lubricating oil and the like, although adapted also for lighter liquids.

In handling viscous materials such as lubricating oils considerable difficulty has been experienced in trying to deliver the same through pipe or hose as in supplying motor cars and various machines with the liquid lubricants which owing to their viscosity tend to cling to the inside of the pipe or hose and continue to drip for a long time after the pump or other means supplying the liquid have been caused to cease their operation. Where oils are handled by first pumping them into a receptacle this difficulty is multiplied with resulting waste of time as well as causing waste of oil and inconvenience of causing same to be scattered over the premises.

The invention as embodied in the present improved nozzle is designed to overcome the difficulties mentioned, it being so arranged as to shut off automatically the flow of liquid being discharged at or near the tip or discharge end of the nozzle at the moment the pump has ceased to operate, and being so constructed as to keep the nozzle sealed tight enough that it will not allow a drip or loss of oil from slight expansion or handling unless pressure should be put on the pipe or hose by the further operation of the pump.

It is a further object of the invention to provide a nozzle for the delivery pipe or hose of a pump or other dispensing device which shall be normally closed, but arranged so that the controlling valve thereof will open upon a predetermined pressure being placed upon the liquid in the pipe or hose by the dispensing device as a pump with which my improved nozzle is adapted to be used.

It is a further object of the invention to provide an improved valve mechanism which shall have an improved valve and seat in which the valve shall be held normally closed by elastic means, but arranged to open upon a predetermined pressure from the inlet side of said shut off nozzle.

It is a further object of the invention to provide in an automatic valve improved means for assembling the valve, the seat and the valve operating and controlling means.

Other objects of the invention will appear from the following description which is directed to the preferred embodiment of the invention as shown also in the accompanying drawing forming a part of the specification, the invention being finally set forth with greater particularity in the appended claims.

In the said drawing Fig. 1 is a longitudinal sectional view through a shut off nozzle showing the constructions of the nozzle and the details of the valve operating and controlling mechanism.

Fig. 2 is a view similar to Fig. 1, but showing the valve operated to open position.

For convenience in manufacture and assembly as well as for opening my improved shut off nozzle for the purpose of gaining access to the valve operating and controlling means I construct the pipe section 10 of the nozzle with a hollow interior or passageway, one end of the same being screw threaded, as indicated by reference character 11, for the purpose of attaching the same to a threaded nipple on the end of a pipe or hose. 12 is an intermediate enlarged chamber, the same communicating with the threaded end portion 11 by means of the port or opening 13. The end of the section 10 opposite the screw threaded end 11 is also screw threaded internally as at 14 to take the externally screw threaded nipple 15 on one end of a pipe section 16 which is shouldered at the end of the threaded portion, as indicated at 17 and is connected at its forward extremity, as indicated at 18, being externally screw threaded to the shoulder 19 to take the internally threaded end 21 of a discharge nozzle 20. The pipe section 16 of the nozzle is provided with the interior passage way 23 and at the intake end adjacent the threaded nipple portion 15 an extension or arm 24 is formed, preferably integral with the body of the section 16, and

extends outside the intake opening of this section so as to be within the enlarged housing or enclosure 12 formed in the pipe section 10. The outlet port at 18 of the section 16 is designed to be closed by a ball valve or poppet 25. This ball valve is preferably made of fiber on account of its lightness, although any other suitable material may be employed, and is perfectly spherical in shape so that it will seat on the cylindrically shaped end of the valve seat 18. A rod 26 passes through an opening bored on a diameter of the valve 25 and is preferably connected to plate 27 by having an angularly turned end thereon passed through an opening in said plate, as indicated at 28. The plate 27 is mounted to rock on pivot pin 29 carried on the extension or arm 24 and it has a pin 30 thereon to which is attached one end of a coil spring 31, the other end of which is attached to a similar pin 32 fixed on the arm or projection 24. The free end of the rod 26 is screw threaded as at 33 and is provided with a pair of adjusting nuts 34, 35 by which the relative position of the valve and its actuating parts may be adjusted.

In the view Fig. 1 the valve is shown in its normal position closing the nozzle against the flow of liquid past the valve seat 18. It will be seen that the relative positions of the pivot pin 29 and the pins 32 and 30 to which the extremities of the spring 31 are attached are such that when the valve is in closed position on the seat 18, as indicated in Fig. 1, the rod 26 will be nearest the pin 29 which supports the plate 27 and at the same time the plate 27 will have rotated until the pin 30 will be at a maximum distance below the line passing through the centers of the pins 29 and 32 so that at this position the power which the spring 31 will exert upon the ball valve 25 will be at its maximum, thus tending to hold the ball valve 25 firmly and securely upon its seat. Consequently, when the valve is closed the pressure on it will be at the maximum.

It will be understood that the nozzle is designed particularly for use with pumps and other dispensing apparatus in which a heavy viscous fluid is to be discharged through the nozzle under pressure, and with the valve mechanism in the position shown in Fig. 1 it will be seen that when sufficient pressure is exerted upon the valve 25 by the liquid the ball valve will lift from its seat and the mechanism will then move to the position shown in Fig. 2, in which position the force exerted on the valve would only be a small fraction of the tension of the spring in this position, because as the valve opens to the position shown in Fig. 2, although the spring will during the opening operation continue to expand, the pivotal connection 28 will rotate around with the plate 27 so that the lever arm of the plate will lengthen and at the same time the pin 30 will move so that it will tend to lie in the same straight line as the pivot pin 29 and the spring pin 32 thus decreasing the length of the power arm, and consequently decreasing the effect of the spring on the rod 26 and the ball valve 25. In this manner after flow of the liquid is once started by the pump or other dispensing apparatus the ball valve will stay from its seat without causing more than a minimum amount of extra work to be performed by the pump or dispensing apparatus on account of the valve. When however, the flow of the liquid has ceased through the nozzle obviously the ball valve will immediately find its seat under the action of the spring 31 after which considerable pressure will have to be exerted to start the flow anew.

It will be seen that the construction of nozzle as described and provided by me insures an easy flow as long as liquid is passing through the nozzle and it results in the valve of the nozzle being sealed tight when the pumping ceases, so that any movement of the hose or pipe or any slight pressure due to expansion will not open the valve of the nozzle but will be taken up by the elasticity of the hose or pipe and the pump. The pressure necessary to start liquid through the nozzle, that is, to open the valve from its initial closed position, may be regulated to suit conditions of liquid being dispensed by means of the adjusting nuts 34, 35 on the threaded rod 26.

While the preferred embodiment of the invention has been shown and particularly described it is not desired to be limited to the details for it will be apparent that persons skilled in the art may resort to various modifications without departing from the purpose and spirit of my invention.

I claim:

1. A valve nozzle for a liquid dispensing device comprising a casing having a hollow interior with inlet and outlet orifices leading thereto and therefrom, a valve, a valve seat, a spring controlled rotatable member all being contained within said casing and an operative connection between the valve and the said rotatable member.

2. A valve nozzle for use with a liquid dispensing device comprising a casing having a hollow interior with inlet and outlet orifices leading thereto and therefrom, a valve, a valve seat, a spring controlled pivoted member, and means for connecting said spring controlled pivoted member with the valve whereby the maximum pressure of the spring controlled pivoted member will be exerted upon the valve in its closed position on the seat, said valve seat and valve and said parts operably connected therewith being all housed on the interior of said casing.

3. A valve nozzle for dispensing liquids comprising three tubular metallic sections screw threaded together, a valve seat on the intermediate one of said screw threaded sections, an arm formed integrally on one end of the intermediate section opposite the said valve seat, a lever pivotally connected with said arm, a spring controlling the movement of said lever, a valve adapted to co-operate with said valve seat, and means for connecting said valve with said lever.

4. A valve nozzle for dispensing liquids comprising three tubular metallic sections screw threaded together, a ball valve seat on the intermediate one of said screw threaded sections, an arm formed integrally on one end of the intermediate section opposite the said ball valve seat, a lever pivotally connected with said arm, a spring controlling the movement of said lever, a ball valve adapted to cooperate with said ball valve seat, and means for connecting said ball valve with said lever.

5. A valve nozzle for dispensing liquids comprising three tubular sections screw threaded together, a valve seat on one end of the intermediate section, an arm at the opposite end of the intermediate section, a lever pivotally connected intermediate its ends with said arm, a spring connected with one extremity of said lever and with said arm, a valve rod pivotally connected to the opposite extremity of said lever and extending longitudinally of the intermediate section and beyond the said valve seat, and a spherical valve member on the said valve rod co-operating with said valve seat.

6. A valve nozzle for dispensing liquids comprising a valve, a valve seat, and means for controlling said valve comprising a lever fulcrumed intermediate its ends, elastic means connected to one end of said lever, a rod carrying the said valve at one end thereof and at its opposite extremity being pivotally connected with the said lever whereby the said elastic means will constantly tend to close the valve and will exert its maximum effect upon the valve when the valve is in closed position on the seat.

In testimony whereof I have signed my name to this specification.

BYRON J. PEPPER.