

Nov. 9, 1937.

E. COOPER ET AL

2,098,487

SPRAY NOZZLE

Filed Oct. 12, 1936

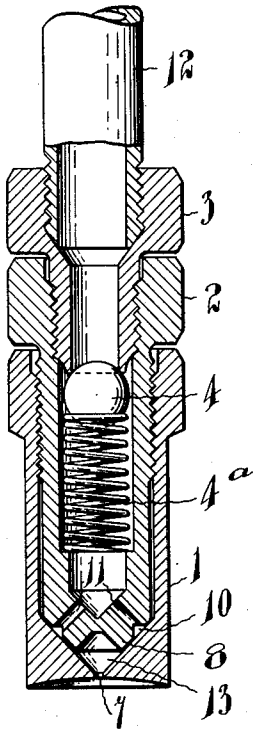


Fig. 1.

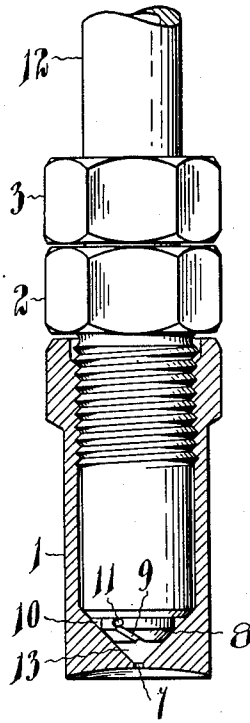


Fig. 3.

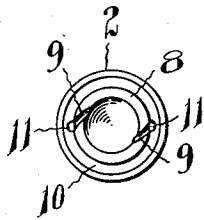


Fig. 2.

Inventors
E. Cooper
T. C. Shields
By *J. Edw. Maybes*
ATTY.

UNITED STATES PATENT OFFICE

2,098,487

SPRAY NOZZLE

Edward Cooper and Thomas C. Shiels, Toronto,
Ontario, Canada, assignors to Elias Rogers Co.
Limited, Toronto, Ontario, Canada

Application October 12, 1936, Serial No. 105,208

2 Claims. (Cl. 299—118)

This invention relates particularly to nozzles used for spraying coal with a dust laying oil as it passes down through chutes into the bags in which it is delivered to the customer. As the discharge through a chute is necessarily intermittent the oil supply to the nozzle must also be intermittent as otherwise oil will be wasted. It is usual therefore to provide an automatic cut-off valve controlled by the coal in passing down the chute. But this valve must necessarily be set some distance back from the jet of the spray nozzle so that every time the valve is closed any oil between the jet and the valve flows out and is wasted.

Our object therefore is to devise a spray nozzle in which the flow of oil will be checked as close as possible to the jet of the spray nozzle.

A further object is to devise an atomizing nozzle which will produce, with the spraying oils commonly used, a well spread, finely divided spray and which by the changing of a single part may be adjusted to vary the rate of spraying.

We attain our objects by means of a construction which may be briefly described as follows.

A pipe connection is provided threaded for connection with an oil pipe. Externally threaded on the connection is a spray conduit and externally threaded on the spray conduit is a spray casing having a spray outlet in its end. The spray conduit and casing are shaped to co-operate to atomize the oil passing to the outlet. By simply removing the spray casing and replacing it with another with a different sized outlet the rate of discharge may be varied. Within the conduit is housed a coil spring bearing against a ball adapted to seat in the pipe connection to cut off the flow of oil close to the nozzle whenever the flow of oil is cut off at any remote point in the oil pipe.

The invention is hereinafter more specifically described and is illustrated in the accompanying drawing in which

Fig. 1 is a longitudinal section of a spray nozzle constructed in accordance with our invention;

Fig. 2 a plan view of the lower end of the spray conduit; and

Fig. 3 a side elevation of part of the end of the spray conduit, a part of the spray casing also being shown in section.

In the drawing like numerals of reference indicate corresponding parts in the different figures.

Referring to the drawing, 12 is an oil pipe which leads to a suitable source of supply. On this oil pipe is screwed the combined valve seat and pipe connection 3. On this connection 3 is exteriorly threaded the spray conduit 2. On this

spray conduit is exteriorly threaded the spray casing 1. The spray conduit and casing co-operate with one another as hereinafter described to produce an atomized oil spray which is projected through the outlet opening 7 in the end of the spray casing. Preferably the end of the spray casing is concaved as shown.

Within the conduit 2 is positioned a coil spring 4 which at its lower end bears on the shoulder 6 formed within the spray conduit. This coil spring 4 bears against a ball 5 and thus holds it seated on the valve seat and connection 3, as shown, as long as the oil in the pipe 12 is not under pressure. Thus, for instance, if for any reason the oil supply through the pipe 12 is cut off, the ball 5 is seated and holds back all the oil in the pipe between the spray nozzle and the point at which the flow through the pipe is cut off. The amount of oil between the ball 5 and the outlet is so small and the latter so fine that substantially no drip takes place once the ball is seated.

Our first object therefore of minimizing the drip is achieved by the construction just described.

As the spray casing is screwed exteriorly on the spray conduit, the casing is easily removed at any time and replaced by another having a different sized aperture and thus another object of our invention is attained.

The spray conduit 2 being threaded on the connection 3, the tension of the spring may be adjusted by screwing the conduit more or less on the connection to just seat the ball 4 when the oil supply is cut off without interfering with the free flow of oil under pressure in the supply pipe. As the screw threads will be made a tight fit, accidental disturbance of the adjustment will not be likely to occur.

To obtain a very finely atomized and cloud-like spray, we have adopted the construction which we will now describe. It will be noted that the end 8 of the spray conduit is frusto-conical in form and in the end of the conduit is formed a small chamber 13, preferably conical in form. Part of the frusto-conical end of the spray conduit is turned down to form with the conical wall of the end of the spray casing an annular chamber of triangular form in cross section indicated by the numeral 10. With this annular chamber communicates the passages 11, which extend into the interior of the conduit and which thus supply oil to the annular chamber.

Spiral grooves 9 are formed in the frusto-conical surface of the ends of the spray conduit,

which grooves convey oil to the chamber 13 in which and the inner end of the outlet 7 the oil is violently whirled to emerge as a flying cloud through the outlet 7.

- 5 A spray nozzle constructed as described will be found to be very simple and effective in action.

What we claim as our invention is:

1. In a three piece spray nozzle the combination of a connection for an oil pipe having an
10 internal valve seat; a spray conduit threaded externally on the connection; a spray casing threaded externally on the spray conduit and having a spray outlet formed in its end, the spray conduit and casing co-operating to atomize oil passing
15 to the outlet; a coil spring housed in the spray

conduit; and a ball within the spray conduit pressed by the spring and adapted to seat in the connection to cut off the flow of oil close to the nozzle when pressure of the oil supply ceases.

2. A spray nozzle according to claim 1 in which the conduit has a frusto-conical end seating
5 against a similar seat formed in the casing and having an outwardly facing frusto-conical chamber formed therein and spiral grooves formed in the frusto-conical surface of its end, the conduit
10 also having formed therein passages leading from its interior and communicating with said grooves at their ends remote from the end of the conduit.

EDWARD COOPER.

THOMAS C. SHIELDS. 15