

Jan. 8, 1957

S. C. BLOOM

2,776,862

SELF-CLEANING SPRAY NOZZLE

Filed Oct. 27, 1954

Fig. 1

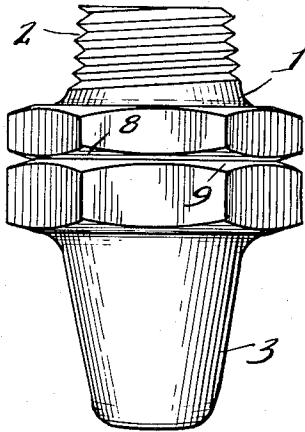


Fig. 2

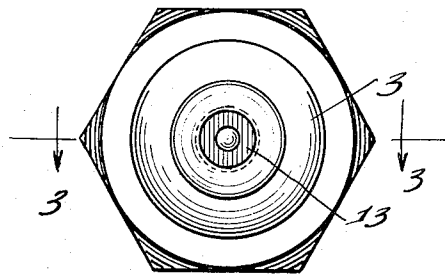


Fig. 4

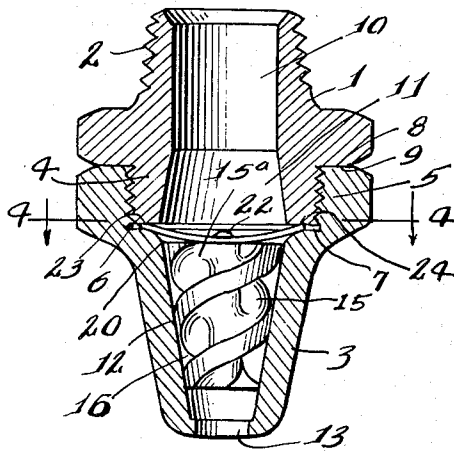
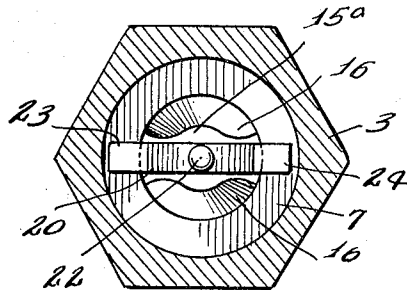
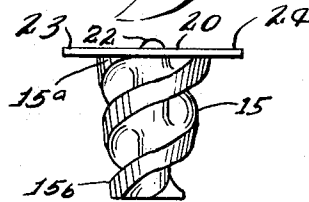


Fig. 3

Fig. 5



Inventor
Samuel C. Bloom
By Schramm, Hofgren
Brady + Weyner
his Attys.

1

2,776,862

SELF-CLEANING SPRAY NOZZLE

Samuel C. Bloom, Chicago, Ill.

Application October 27, 1954, Serial No. 465,042

1 Claim. (Cl. 299—59)

This invention relates to a self-cleaning spray nozzle and, more particularly, to a self-cleaning spray nozzle which operates to clean itself of accumulated dirt or other foreign particles.

A general object of this invention is to provide a self-cleaning spray nozzle having a core which is maintained in operating position by the pressure of the fluid normally passing through the nozzle and which shifts to dislodge and allow passage of accumulated dirt through the nozzle upon reduction of the fluid pressure.

Another object of the invention is to provide a self-cleaning spray nozzle having a tapered fluid passage in which is mounted a tapered core having grooves for imparting a rotary motion to the fluid passing therethrough and wherein the core is held in engagement with the walls of the passage by the pressure of the fluid passing therethrough and is moved out of its normal operating position by spring means when the pressure of the fluid is substantially reduced.

The objects of the invention generally set forth, together with other ancillary advantages, are attained by the construction and arrangement shown by way of illustration in the accompanying drawing, in which:

Fig. 1 is a plan view of the spray nozzle;

Fig. 2 is a front elevation of the nozzle;

Fig. 3 is a plan section along the line 3—3 of Fig. 2;

Fig. 4 is a section in elevation along the line 4—4 of Fig. 3; and

Fig. 5 is a plan view of the core having a normally flat leaf spring attached thereto.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an illustrative embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claim. The term "fluids" as used herein is used in its generic sense so as to include liquids, vapors, gases or mixtures thereof and with or without solids.

A self-cleaning spray nozzle embodying the principles of the invention comprises a base 1 having a screw-threaded connecting portion 2 for securing the nozzle to a fluid source and a tapered cap 3 which is secured to the base 1. The base has a screw-threaded annular flange 4 and the cap 3 has an internally threaded end 5 for joining the cap and base. A space 6 is provided between the flange 4 and an adjacent portion 7 of the cap which constitutes an annular recess for a purpose described more fully hereinafter. A shoulder 8 on the base 1 is in engagement with a shoulder 9 on the cap 3 to effect a liquid-tight joint between the base and cap.

A fluid passage extends through the base 1 and cap 3 and comprises a chamber 10 in the base having a tapered portion 11 and a tapered chamber 12 in the cap. The chamber 12 terminates in a spray aperture 13 to permit

2

emission of the fluid in the form of a spray or mist from the chamber 12.

Spray nozzles of the character described are frequently used in connection with refrigeration apparatus for producing a spray or mist of cooled brine. In order to produce this mist or spray, a tapered core 15 is mounted in the tapered chamber 12 provided in the cap 3. This core has a large end 15a and a small end 15b and is provided with a double helical groove 16 to divide the passing liquid into two streams and give them both a rotary motion to assist in forming the spray or mist issuing from the spray aperture 13.

The foregoing spray nozzle structure is disclosed in my Patent No. 1,731,813, granted October 15, 1929.

In the use of a nozzle of the type described a certain amount of dirt or other foreign particles accumulates at the point of greatest restriction which is in the double helical groove. In the past it was necessary to either remove the cap to permit access to the accumulation of dirt, or, if the accumulation of dirt was not too great, the nozzle could be cleaned without removing the cap by inserting the point of a nail or other small instrument into the spray aperture 13 to engage the core and push it back while a small stream of liquid, at reduced pressure, is flowing. This movement of the core would loosen the dirt and permit it to issue from the spray aperture 13.

I have provided means for automatically effecting movement of the core to loosen up the dirt or other particles and permit them to issue from the spray aperture 13. This means comprises a normally flat leaf spring 20 which is secured at approximately its middle to the larger end 15a of the core 15 by suitable means, such as a flattened head 22 on the core 15. The ends 23 and 24 of the leaf spring are loosely mounted in the recess 6 formed by the space between the flange 4 and portion 7 of the cap.

The spring need not be flat but may be in the form of a spiral or helically wound wire spring fastened to the core 15 as well as a spring brass wire suitably shaped to be secured to the core.

The refrigeration apparatus or system may operate at a fluid pressure of 5 to 10 pounds per square inch. This pressure will force the core into normal operating position wherein it is in engagement with the wall of the chamber 12 provided in the cap 3 and will result in bending the leaf spring 20 and slight movement of the ends 23 and 24 of the spring in the recess 6.

The spring is designed so as to cause retraction of the core away from the wall of the chamber 12 when the pressure of the fluid falls below a selected point. In a preferred embodiment, the spring is designed to cause retraction of the core when the fluid pressure falls below one pound per square inch.

In order to effect cleaning of the nozzle, the operator of the equipment will reduce the fluid pressure below the selected point whereby the spring will cause retraction of the core. This will loosen up the dirt located in the double helical groove 16 and permit it to be carried out of the nozzle through the spray aperture 13 by the reduced stream of fluid. Upon return of the system to normal pressure, the core and spring will rotatably move back to operating position wherein the core engages the wall of chamber 12 with resultant flexing of the spring 20.

In practicing my invention, the core need not be tapered but could be cylindrical and provided with one or a plurality of helical grooves. The operating position of the core is determined by the core resting against a shoulder in the cap 3.

I claim:

In a self-cleaning spray nozzle, a base adapted to be secured to a fluid source and having a threaded annular flange, a cap secured to the base flange, a fluid passage extending through the base and cap terminating in a spray

3

aperture provided in the cap and having a tapered chamber in the cap portion thereof, a tapered core disposed generally solely within said tapered chamber, said core having a normal operative position in engagement with the wall of the tapered chamber and having external grooves through which the fluid passes, an annular recess provided by a gap between the cap and base flange, and a leaf spring secured at approximately its middle to the core and having its ends loosely fitted at all times in said recess, said spring being flexed when said core is in normal operative position and acting to withdraw the core from said position when the pressure of the fluid passing therethrough is reduced to loosen dirt accumulated be-

4

hind the core and permit said dirt to pass through the spray aperture.

References Cited in the file of this patent

UNITED STATES PATENTS

602,074	Gumtow	Apr. 12, 1898
1,040,899	Dahmen	Oct. 8, 1912
1,089,406	Fitts	Mar. 10, 1914
1,280,062	Martz	Sept. 24, 1918
1,731,813	Bloom	Oct. 15, 1929
2,727,784	Hansen	Dec. 20, 1955