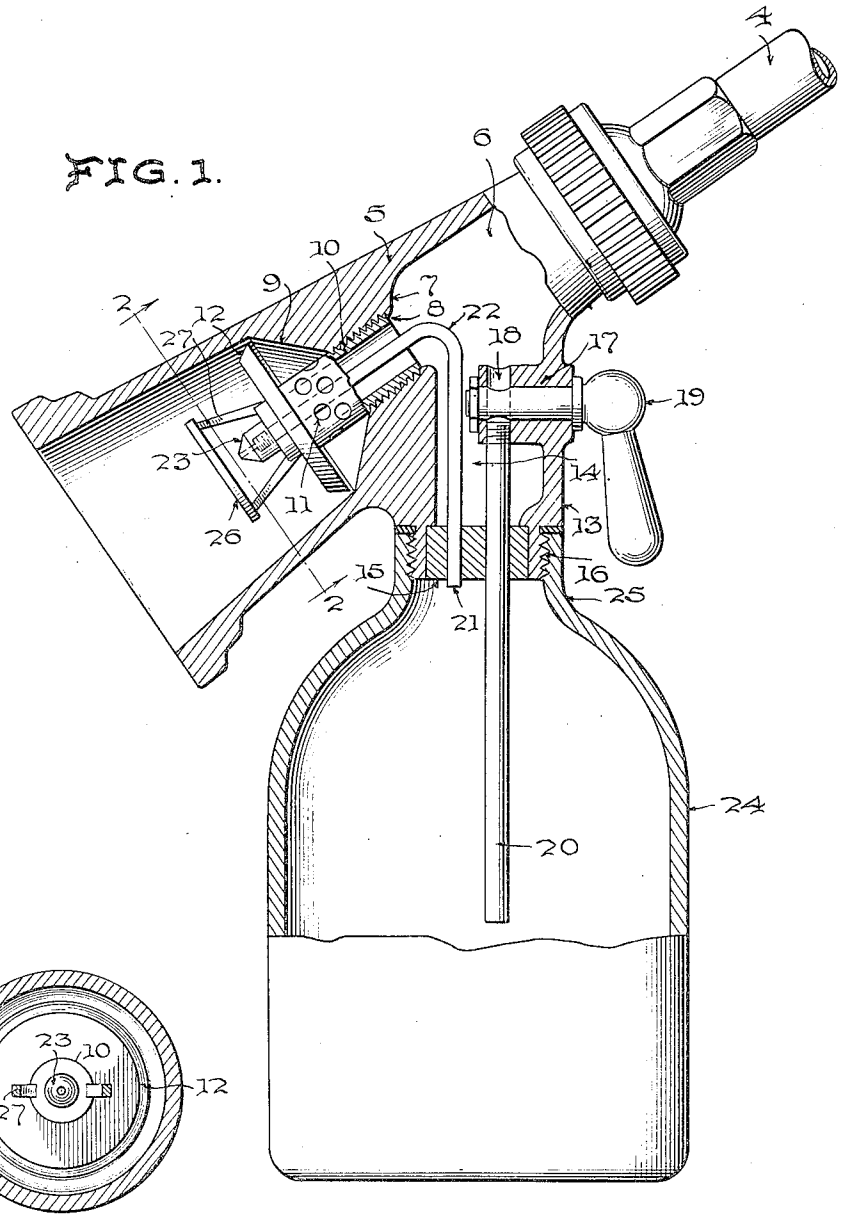
Jan. 23, 1951 H. W. RICHARDS 2,538,948

SPRAY DEVICE

Filed Oct. 24, 1945

FIG. 1.



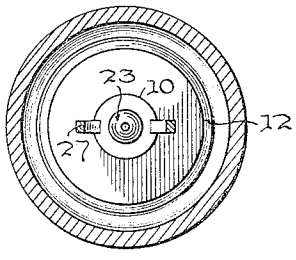


FIG. 2.

INVENTOR.
HARRY W. RICHARDS
BY
Royal E. Burnham,
ATTORNEY

Patented Jan. 23, 1951 2,538,948

UNITED STATES PATENT OFFICE

2,538,948

SPRAY DEVICE

Harry W. Richards, Washington, D. C.

Application October 24, 1945, Serial No. 624,109

3 Claims. (Cl. 299—84)

1

This invention relates to means for injecting into fluid spray streams cleaning, aromatic, disinfecting, fertilizing, paraciticide, or other substances it is desired to supply to an objective.

It is conventional to divert fluid and dust from a supply pipe through a by-pass containing material to be dissolved by or mixed into the diverted stream and to return the by-passed stream into the main stream before it reaches a discharge nozzle or spray head.

Spray nozzles and heads, having as they do constricted passages, give much resistance to discharge therefrom of fluent substances and cause increased pressure behind the discharge point. This pressure is about equal at the points of by-pass intake and exit.

It has been found in practice that, with such an arrangement, back pressure at the exit of the by-pass is such that there is little, if any, flow through the by-pass, and that adequate quantities of added substances are not introduced into the spray.

This invention provides an arrangement for overcoming this fault.

When considered with the description herein, characteristics of the invention are apparent in the accompanying drawing, wherein an adaptation of the invention is disclosed in association with a shower spray for purpose of exemplification.

Like reference-characters refer to corresponding parts in the views of the drawing, of which—

Fig. 1 is a vertical section of a spray unit;

Fig. 2 is a section on line 2—2, Fig. 1.

A spray unit such as that disclosed in Fig. 1 usually is carried by a supply pipe 4 to which hot and cold water is supplied by valve-controlled pipes.

As shown in that figure, the unit includes a hollow spray head 5, which flares in increasing diameter from its connection with the supply pipe 4 to its outer end. A main passage 6 in the head is constricted by a wall 7, which has a threaded port 8 coaxial with the passage. The wall has an outside inclined surface 9. A hollow threaded plug 10 has radial exit ports 11, and it is closed beyond those ports. The plug has an annular flange 12 positioned opposite to the inclined surface 9 of the wall 7. Water passing into the plug is discharged radially from the ports 11 against the inclined surface 9 and emerges as a spray between that surface 9 and the flange 12. The character of the spray is regulated by turning the plug.

This invention provides such a spray head

2

with a lateral extension 13, which contains a chamber 14 opening to the main spray head passage. The chamber is closed at its outer end by a plug 15. The extension is exteriorly threaded at its outer end 16. A part 17 of the extension wall protrudes into the chamber 14, and it has a port 18. Flow of water through the port is controlled by a valve 19.

A by-pass tube 20 extends from the port 18 through the plug 15 and outwardly from the extension. A by-pass discharge tube 21 extends through the plug 15 into the main passage 6 of the shower head. It is bent in that passage, at 22, and it is disposed therefrom through the plug 10 in the axis thereof and through the closed end of the plug, where it terminates in a discharge nozzle 23 screwed onto the tube.

This nozzle thus is beyond the point of spray initiation at the flange 12, and thus beyond the water pressure behind the constricted opening between that flange and the inclined wall 7. Consequently, there is no back pressure at the nozzle to deter emission of fluid therefrom.

A closed container 24, having an interiorly threaded neck 25, is tightly connected to the extension 13 by turning onto the threaded end thereof.

The tubes 20 and 21 and the container 24 constitute a single by-pass from the rear portion of the shower-head passage to a point beyond that of spray initiation in the outer part of the head. The container constitutes means in the by-pass to hold substances to be introduced into the spray.

Any substance desired to be dissolved or otherwise assimilated and introduced into the spray may be placed in the container 24. Fluid enters the container through the port 18 and tube 20. After taking up substances in the container, the fluid is forced through the discharge tube 21 to and out of the nozzle 23, and it is deflected laterally by baffle 26 into the spray, the baffle being carried by arms 27 extending from the free end of the plug 10.

When the unit is used for bath purposes, such substances as bath salts, soap, aromatics, etc., may be used. The invention also is adapted for introduction into sprays of fertilizer, paraciticide, disinfectant, and other matter placed in the container.

I claim:

1. In a spray device, the combination of a spray head having a main passage therethrough and provided at one end with means for attaching the head to a source of fluid supply to said passage, a

constricting wall of said passage having a threaded port therethrough, said wall at its outer end having an outwardly inclined surface, a hollow threaded plug rotatable in said port, said plug being open at its inner end and closed at its outer end, and said outer end projecting beyond said constricting wall, and said plug also having radial exit ports in the side of its projecting part opposite to said inclined wall surface, an annular transverse flange on said plug beyond said exit ports positioned opposite to said inclined wall surface, and a by-pass extending from the inlet portion of said main passage to a discharge end positioned beyond said annular flange, said by-pass including a container for matter to be taken up by fluid flowing therethrough.

2. In a spray device, the combination of a spray head having a main passage therethrough and provided at one end with means for attaching the head to a source of fluid supply to said passage a constricting wall of said passage having a threaded port therethrough, said wall at its outer end having an outwardly inclined surface, a hollow threaded plug rotatable in said port, said plug being open at its inner end and closed at its outer end, and said outer end projecting beyond said constricting wall, and said plug also having radial exit ports in the side of its projecting part opposite to said inclined wall surface, an annular transverse flange on said plug beyond said exit ports positioned opposite to said inclined wall surface, a lateral extension on said spray head containing a chamber in communication with said main passage and having means to connect a container to its outer end, a closure for said end, an extension having a port therethrough protruding into said chamber, a manually operable valve controlling said port, a by-pass tube extending from said port through said closure, a by-pass discharge tube extending from the outside of and through said closure and having an end portion disposed through said threaded plug, and a discharge nozzle on the end of said by-pass discharge tube positioned beyond said flange.

3. In a spray device, the combination of a spray head having a main passage therethrough and provided at an end with means for attaching the head to a source of fluid supply to said passage, a constricting wall of said passage having a threaded port therethrough, a hollow threaded plug rotatable in said port, said plug being open at its inner end and closed at its outer end, and said outer end projecting beyond said constricting wall, and said plug also having radial exit ports in the side of its projecting part, a lateral extension on said spray head containing a chamber in communication with said main passage and having means to connect a container to its outer end, a closure for said end, an extension having a port therethrough protruding into said chamber, a manually operable valve controlling said latter port, a by-pass tube extending from said latter port outwardly through said closure, a by-pass discharge tube extending from the outside of and through said closure and having an end portion disposed through said threaded plug, and a discharge nozzle on the end of said by-pass discharge tube positioned beyond said exit ports.

HARRY W. RICHARDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
605,033	Van Riper	May 31, 1898
719,587	Hasbrouck	Feb. 3, 1903
1,057,657	Mott	Apr. 1, 1913
1,458,975	Clauson	June 19, 1923
1,519,462	Loker	Dec. 16, 1924
1,535,702	Walsh et al.	Apr. 28, 1925
1,967,909	Sonner	July 24, 1934
2,029,141	Warner	Jan. 28, 1936
2,131,796	Day	Oct. 4, 1938
2,135,969	Donaldson	Nov. 8, 1938
2,207,758	Rehse	July 16, 1940