

June 9, 1931.

J. F. SCHYLANDER

1,809,073

SPRAY

Filed Oct. 12, 1928

Fig. 1

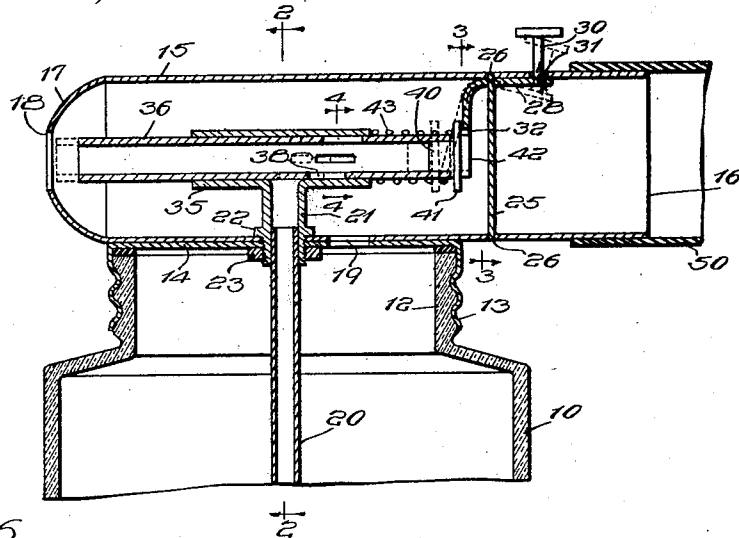


Fig. 6

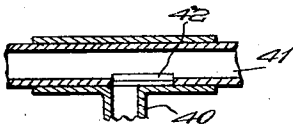


Fig. 2

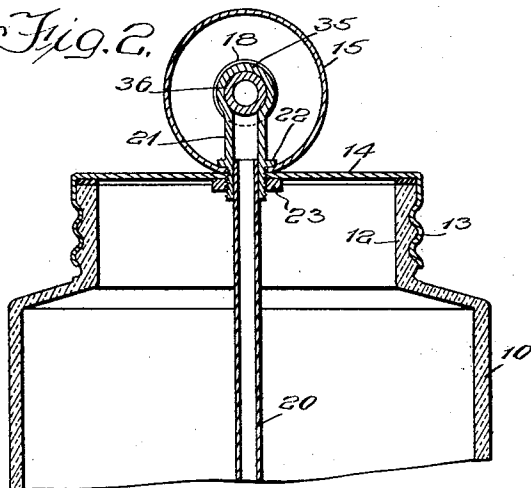


Fig. 3

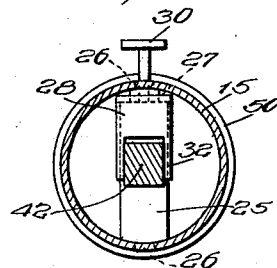


Fig. 4

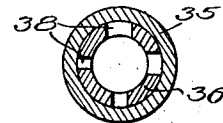


Fig. 5



Witness:

William P. Kilroy

BY

Inventor
John F. Schylander

Hill & Hill

Attys

UNITED STATES PATENT OFFICE

JOHN F. SCHYLANDER, OF CHICAGO, ILLINOIS

SPRAY

Application filed October 12, 1928. Serial No. 312,057.

My invention relates to sprays and has to do more particularly with devices for producing a spray of finely atomized liquid material such as paint or other pigment, disinfectant, fungicides, and insecticides, finely divided powdered material, etc.

An object of my invention is to provide a device for producing a spray of material in a quantity variable at the will of an operator and for any desired length of time with slight effort on the part of the operator.

A further object is to provide a device of the class described which will consist of a small number of relatively simple parts, the device being inexpensive to manufacture, rugged, and easy to operate.

A still further object is to provide such a device in which the quantity of material being sprayed per unit time may be semi-permanently adjusted between maximum and minimum limits, while such quantity may be varied by an operator at will within these limits.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

Referring now to the drawings forming a part of this specification and illustrating a preferred embodiment of the invention;

Fig. 1 shows a vertical section through a device embodying my invention mounted on a container, the latter being shown fragmentarily;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary developed view of a modified sleeve valve forming a part of my invention; and

Fig. 6 is a fragmentary sectional view of a modified form of valve.

In the particular preferred embodiment shown in the drawings, the numeral 10 indicates a container of any desired shape, size or material for holding a liquid or powder which is to be sprayed. This container has a neck 12 which is preferably cylindrical and may be exteriorly threaded to engage the threaded portion 13 of the cap member 14. The cap member 14 is preferably formed of sheet metal or the like and has secured to the upper portion thereof, preferably by solder or other suitable means, a tubular member 15. This tubular member is open at one end as at 16 and terminates at its opposite end in the hemispherical portion 17, apertured as at 18. An aperture 19 in the tubular member 15 and in the cap 14 provides communication between the interior of the tubular member 15 and the interior of the container 10.

A tubular member 20 extends downwardly into the container from the cap 14 and is secured to the latter by means of a T-shaped tubular member 21. It will be noted that the leg of the T-shaped tubular member 21 is disposed in a suitable aperture in the members 14 and 15 and has an annular shoulder 22 on the leg of the T which abuts against the cap 14, a ring 23 being threaded on the lower end of the leg of the T-shaped member so as to secure it rigidly to the cap.

Extending diametrically from top to bottom within the tubular member 15 is a bar 25. This bar may be secured to the tubular member 15 by any suitable means, but in the preferred embodiment has a tongue 26 projecting from each end and secured in suitable apertures provided in the walls of the tubular member 15. (See Fig. 3.) Formed on the upper portion of the bar is a shoulder 27, this shoulder being disposed in a slot formed in a lever member 28, so as to function as a pivot for the lever. It will be noted from Fig. 1 that the lever 28 is of the bell crank type, having a manipulating member 30 attached to one end thereof and extending through an aperture 31 in the top

of the tubular member 15, while the opposite end of the lever is forked as at 32.

Slidably disposed in the cross portion 35 of the T-shaped member 21 is a tubular member 36 serving as a sleeve valve. The tubular member 36 is provided intermediate of its ends with a plurality of slots or ports 38, there being four in the present embodiment. It will be noted that the ports 38 are elongated and are arranged in staggered relation, and are graduated in width. Disposed in the end of the tubular member 36 is a plug 40 having an annular shoulder 41 and an abutment 42, although this abutment may be in any suitable form for seating the forked end 32 of the lever 28. A helical compression spring 43 is disposed around the tubular member 36 between the end of the cross portion 35 of the T and the shoulder 41.

In the operation of the device above described, the material which it is desired to spray is placed in the container 10 and the tubular member 15 is preferably connected to a resilient conduit such as shown fragmentarily at 50 in Fig. 1, leading from any suitable source of air pressure (not shown). Such source of pressure may be a vacuum cleaner operating as a blower, a pump, an air reservoir, or other suitable means. In its normal condition, the parts will be in the position shown in full lines in Fig. 1, and air entering the tubular member 15 from the conduit 50 will pass in part directly through the tubular member 15 and out through the opening 18 while a portion of the air will pass into the container 10 through the opening 19. Thus, no spray will be produced, inasmuch as the valve ports 38 do not communicate with the leg portion of the T member 21 or with the tubular member 20.

When, however, it is desired to produce a spray, the manipulating member 30 is rocked about its pivot on the bar 25. Inasmuch as the bell crank lever 28 connected to the manipulating member 30 abuts against the shoulder 31 of the tubular member 36, this tubular member will thus be urged forwardly, sliding in the T member 21 against the resilient resistance of the spring 43. This movement brings the open end of the tubular member 36 to a position adjacent the opening 18 of the tubular member 15 as shown in dotted lines in Fig. 1, there being an annular space between the tubular member 36 and the wall of the member 15. In such a position, the portion of the air directed into the tubular member 15 will pass directly through this tubular member and out through the annular space above referred to, this air pressure tending to set up a vacuum within the tubular member 36. The portion of the air which enters the container 10 through the opening 19 will exert a pressure on the material within the container

and tend to force it up the tube 20. Hence the material will enter the tubular member 36 through the port 38 which is in registry with the leg of the T-shaped member and will issue from the end of the tubular member 36 in the form of a fine cloud or spray.

It should be noted here that the ports 38 are staggered to allow for the fact that the vacuum set up within the member 36 is greater the closer the end of this member is to the opening 18. Hence, the larger ports 38 are spaced rearwardly, in order that the member 36 may be projected more forwardly, to obtain the higher vacuum required. The spray will continue so long as the air pressure is maintained, so long as there is material in the container 10, and so long as the parts are retained in the position shown in dotted lines. When it is desired to discontinue the spray, it is merely necessary to release the manipulating member 30, whereupon the spring 33 will move the tubular member 36 back to the position shown in full lines, thus moving the port 38 out of registry with the tubular member 20.

Should it be desired to vary the quantity of material issuing in a unit of time from the device, it is merely necessary to move the tubular member 36 forward by means of the manipulating member, grasp the end of the tubular member 36 with the fingers (it being understood that the device is so constructed that the tubular member 36 may be moved by the manipulating member to a position where its end will project slightly out of the opening 18), and rotate it to the desired extent. Inasmuch as the abutment 42 has opposed parallel faces, it will be obvious that the tubular member 36 may be rotated through an angle equal to those of the member 42, or any multiple thereof, and fixed in such position by the forked end 32 of the lever 28. The forked end will engage a pair of opposed faces of the member 42 and, in the manipulation of the spray, will prevent the tubular member from rotating, retaining it in the adjusted position. Inasmuch as the ports may be finely graduated in width, and made of any desired number, the number of faces on the member 42, of course, being made equal to the number of ports, it will be apparent that the port area communicating with the tubular member 20 may be varied as desired. This feature is of great importance, furthermore, in dealing with liquids of different viscosities, a more viscous material requiring a larger port than one of lower viscosity. Furthermore, it will be obvious that the volume of the spray may be varied within the limits set by the adjustment described above by the extent to which the tubular member 36 is moved forward by the manipulating member.

As shown in Fig. 6, I may, if desired,

provide the tubular valve member with only a single opening and have this opening of such length that it registers at all times with the tubular member 20. In the embodiment shown, a T-shaped tubular member 40 slidably journals a sleeve valve 41, the latter having a single elongated slot or port 42. In such a case, the volume of spray is controlled entirely by the amount of vacuum set up adjacent the opening 18, this vacuum varying according to the distance of the end of the member 36 from the opening 18. Hence, as the valve 41 is moved forward by the manipulating member, the spray will increase until the end of the valve is flush with the opening 18.

Hence, it is evident that two means of adjustment are provided, one of which is semi-permanent and fixes the maximum and minimum limits of the quantity of material which may be projected out of the spray, and the other being variable at the will of the operator and controlling the volume of material within the limits set by the semi-permanent adjustment.

The device is easily carried to any point where the spray is desired, inasmuch as the conduit 50 is usually flexible. The tubular member 15, if desired, may be used as a handle, and the manipulating member displaced by the thumb, thus leaving the other hand free.

Having thus described my invention it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a tubular member closed at one end and having an opening in registry with the outlet opening of said air conduit, means for slidably supporting said tubular member coaxially in said air conduit, means for conducting material to said tubular member, and means for moving said tubular member longitudinally and means operable by said longitudinal movement to regulate the flow of material into said tubular member and for placing its opening within that of said air conduit.

2. In a device of the class described, an air conduit having an inlet opening, an outlet opening, a tubular member closed at one end and having an opening in registry and concentric with the outlet of said air conduit, means for slidably supporting said tubular member coaxially with said air conduit, said supporting means serving also to

conduct material to said tubular member, and means for moving said tubular member longitudinally, said tubular member having a port movable into and out of registry with said material conducting member.

3. In a device of the class described, an air conduit having an inlet opening, an outlet opening, a tubular member closed at one end and having an opening in registry with the outlet opening of said air conduit, means for slidably supporting said tubular member coaxially in said air conduit, said supporting means serving also to conduct material to said tubular member, and means for moving said tubular member longitudinally said tubular member having a plurality of elongated ports of unequal widths selectively movable into and out of registry with said material conducting member.

4. In a device of the class described, an air conduit having an inlet opening, an outlet opening, a tubular member closed at one end and having an opening in registry with the outlet opening of said air conduit, means for slidably supporting said tubular member coaxially in said air conduit, said supporting means serving also to conduct material to said tubular member, and means for moving said tubular member longitudinally, said tubular member having a plurality of staggered elongated ports, said ports being graduated in width and selectively movable into and out of registry with said material conducting member.

5. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a T-shaped tubular member disposed in said conduit having a leg secured in the bottom thereof and a cross portion disposed coaxially of said conduit, a conduit for material communicating with the leg of said T member, a tubular member closed at one end, and having an opening in registry and concentric with the outlet of said air conduit, slidably disposed in the cross portion of said T member, means operable to move said tubular member longitudinally, means operable to control the flow of material into said tubular member in accordance with the longitudinal displacement thereof, and means for preventing accidental rotation of said tubular member.

6. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a T-shaped tubular member disposed in said conduit having a leg secured in the bottom thereof and a cross portion disposed coaxially of said conduit, a conduit for material communicating with the leg of said T member, a tubular member closed at one end and having an opening in registry and concentric with the outlet of said air conduit slidably disposed in the cross portion of said T member, means operable to move the tubular member longitu-

dinally, means operable to control the flow of material in said tubular member in accordance with the longitudinal displacement thereof, and means for yieldably retaining said tubular member in a position where material will not pass therethrough.

7. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a T-shaped tubular member disposed in said conduit having a leg secured in the bottom thereof and a cross portion disposed coaxially of said conduit, a conduit for material communicating with the leg of said T member, a tubular member closed at one end and having an opening in registry within the outlet opening of said air conduit slidably disposed in the cross portion of said T member, means for moving said tubular member longitudinally for controlling the flow of material therethrough, and a helical spring on said tubular member and cooperating with said T member for yieldably retaining said tubular member in a position where material will not pass therethrough.

8. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a tubular member closed at one end and having an opening in registry with the outlet opening of said air conduit, means for slidably supporting said tubular member coaxially with said air conduit, means for conducting material to said tubular member, and means for moving said tubular member on its longitudinal axis, said tubular member having a plurality of ports therein so arranged that the maximum and minimum rates of discharge of material passing through said tubular member may be fixed by rotation of said tubular member while said volume may be adjusted within said limits by longitudinal displacement of said tubular member.

9. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a tubular member closed at one end and having an opening in registry with the outlet opening of said air conduit, means for slidably supporting said tubular member coaxially with said air conduit, means for conducting material to said tubular member, and means for sliding said tubular member on its longitudinal axis, said tubular member having a plurality of ports therein so arranged that the maximum and minimum rates of discharge of material flowing through said tubular member may be fixed by rotation of said tubular member while said flow may be adjusted within said limits by longitudinal displacement of said tubular member, and means for preventing accidental rotation of said tubular member.

10. In a device of the class described, an air conduit having an inlet opening and an outlet opening, a tubular member closed

at one end and having an opening in registry with the outlet opening of said air conduit, means for slidably supporting said tubular member coaxially with said air conduit, means for conducting material to said tubular member, and means for sliding said tubular member on its longitudinal axis, said tubular member having a plurality of ports therein so arranged that the maximum and minimum rates of discharge of material flowing through said tubular member may be fixed by rotation of said tubular member while said flow may be adjusted within said limits by longitudinal displacement of said tubular member, a member having opposed parallel faces, said member projecting from the closed end of said tubular member, and means on said sliding means engageable with said projecting member for preventing accidental rotation of said tubular member.

In testimony whereof, I have hereunto signed my name.

JOHN F. SCHYLANDER.