Sept. 8, 1931. F. G. MITCHELL 1,822,743

ATOMIZER OR SPRAYER

Filed Aug. 6, 1927

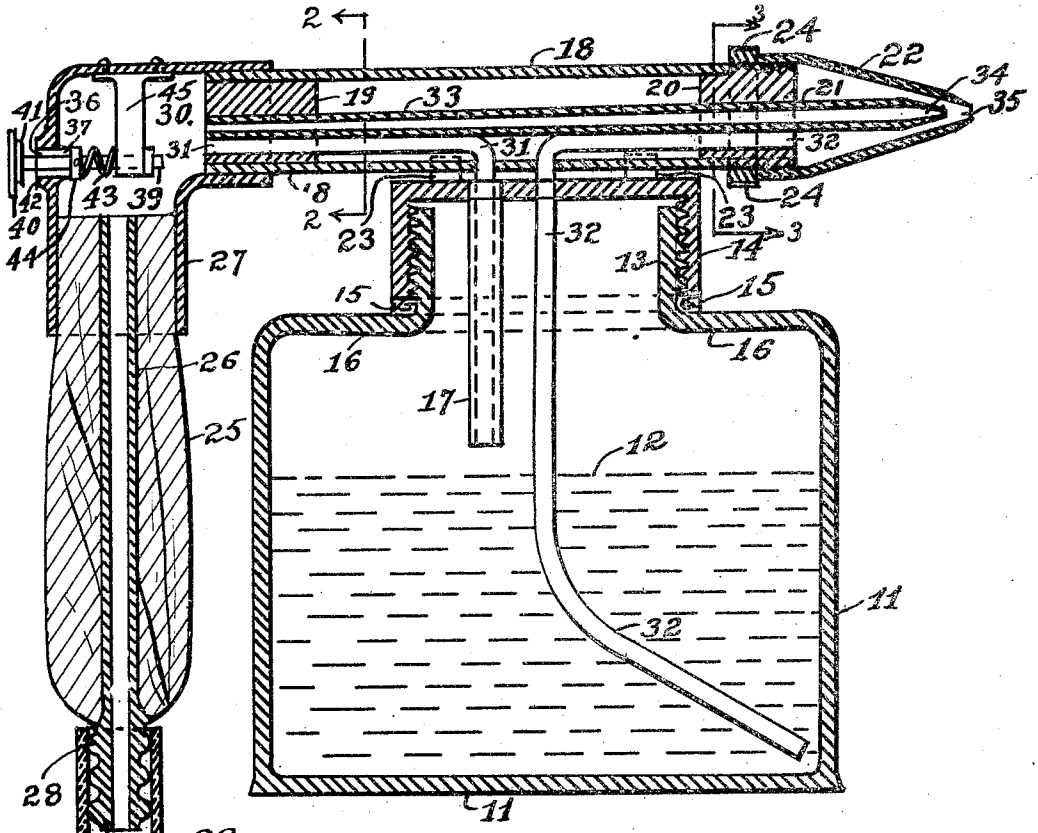
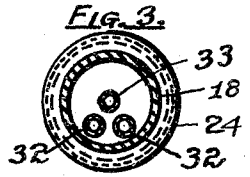


FIG. 1.

FIG. 3.



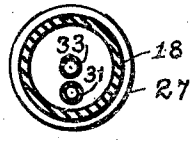


FIG. 2.

FIG. 4.

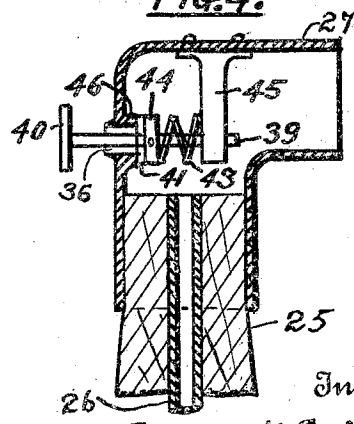
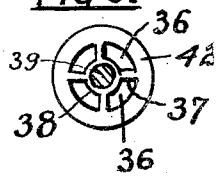


FIG. 5.



Inventor:
Frederick G. Mitchell
By his Attorney
Israel Benjamins.

Patented Sept. 8, 1931

1,822,743

UNITED STATES PATENT OFFICE

FREDERICK G. MITCHELL, OF RIDGEFIELD PARK, NEW JERSEY

ATOMIZER OR SPRAYER

Application filed August 6, 1927. Serial No. 211,109.

My invention relates to improvements in atomizers or sprayers for inks, paints, varnishes, enamels, liquid bronzes, lacquers, and similar substances, and it consists in the novel features, which are hereinafter more fully described.

One of the objects of my invention is—to produce a perfected atomizer or sprayer in which compressed air or gas under pressure is employed to press on the surface of a liquid in a container, thereby forcing the liquid out of the container through a suitable nozzle or nozzles, thereby spraying said liquid, and to provide said atomizer or sprayer with a means for instantaneously discontinuing the spraying, thereby economizing spraying material, and saving time in manipulating the atomizer or sprayer.

Another object of my improvement is—to provide said atomizer or sprayer with a means for instantaneously releasing the pressure of the air or gas in said container, thereby discontinuing the spraying through said nozzle.

A further object of my invention is—to have the pressure of the air or gas in said container and the release of said pressure always under the control of the operator of the atomizer or sprayer.

A still further object of my improvement is—to have my said controlling and releasing means simple, durable and inexpensive.

A further object of my invention is—to provide against the accidental stopping up of the liquid feed pipe of the atomizer or sprayer.

And a still further object of my invention is—to improve the economy and speed of atomization of the atomizer or sprayer.

Other objects and advantages will hereinafter appear.

I attain these objects by means of the atomizer or sprayer and the sundry parts thereof, as illustrated in the accompanying drawings, or by any mechanical equivalent or obvious modification of the same.

In the drawings, Fig. 1 is a vertical section of one form of my atomizer or sprayer, showing sundry tubes in elevation.

Fig. 2 is a detail view in cross-section on the line 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a detail view in cross-section on the line 3—3 of Fig. 1, looking in the direction of the arrows and showing the discharge plug, which is hereinafter described, in elevation.

Fig. 4 is a fragmentary detail view showing a modification of the releasing means of my atomizer or sprayer.

Fig. 5 is a detail view in elevation of the pressure release opening, which is hereinafter described.

Similar numerals refer to like parts throughout the several views.

11 designates a container for a liquid 12, which is to be sprayed; it may be made of metal, glass or any other suitable material; but I prefer to make the container of metal.

A neck 13 is provided for said container 11; the neck 13 is threaded exteriorly thereof, to receive a cap 14, which is interiorly threaded, as shown; a gasket 15, of leather or any other suitable material, is shown as interposed between the lower edge of said cap 14 and the shoulder 16 of said container 11, to prevent leakage of compressed air or gas between said neck 13 and cap 14.

A down draft tube 17 is shown as connected at its upper end to the top of said cap 14 and extending into the upper part of the interior of said container 11.

A tubular member 18 is shown as mounted on the top of said cap 14 by means of saddles 23,—which may be soldered to both the cap 14 and said member 18.

A rear plug 19 is shown as inserted into one end of said member 18; the other end of said member 18 is shown as connected to the shouldered end of a discharge plug 20, which has an exterior nozzle connected thereto by means of a screw thread, as shown.

A locknut 24 is shown as secured to the intermediate part of said plug 20, exteriorly thereof, by means of said screw thread, to secure said nozzle 22 in position.

The locknut 24 is shown in Fig. 3 as circular in outline, and the periphery thereof may be knurled, to facilitate turning of the same by hand.

A handle or holder 25, encloses a hollow air duct 26, and is shown as connected by means of a fitting 27 to one end of said member 18 at said plug 19. Said fitting 27 forms a continuation of said holder 27.

Said duct 26 is shown as terminating at its lower end in a hose-connection 28, whereby it may be joined to a flexible member 29, leading to a source of compressed air or gas, such as an air compressor.

An inner space or chamber 30 is formed inside of said fitting 27 above said handle 25 and exteriorly of said plug 19.

A bent tube 31 is shown as having one end thereof passing through said plug 19, to which it may be connected in any suitable manner, and the other end thereof inserted into the upper end of said down draft tube 17, to which it may be suitably secured, to prevent leakage of compressed air or gas at the joint.

In this way compressed air or gas may be passed through said hose 29, duct 26, chamber 30 and tube 31 to the upper part of the interior of said container 11, to press on the surface of the liquid, which is maintained in said container 11.

A pair of bent liquid discharge tubes 32 are shown as having their lower ends extending through said liquid 12 to a short distance from one side of the bottom of said container 11 interiorly thereof; the tubes 32 pass through the top of said cap 14 and through the underside of said member 18 and have their upper ends passing through said plug 20, thereby allowing said liquid 12 to be discharged therethrough to the interior of said nozzle 22, and thence to the atmosphere.

By using more than one of said tubes 32 a more copious flow of the liquid 12 into said nozzle 22 is obtained and also provision is thereby made against the accidental stopping up of one of said tubes 32.

An atomizer air tube 33 is shown as passing at one end thereof through said plug 19 and at the other end thereof through the center of the main part of said plug 20, and terminating in an interior nozzle 21, thereby allowing a stream of compressed air or gas to flow from said chamber 30 to the interior of said nozzle 21, to atomize the liquid issuing from said nozzle 22 under the influence of the pressure on the surface of said liquid 12 in said container 11, as above described.

The connections of all of the above tubes may be made leakless, whereby the interior of said member 18 outside of said tubes may be free from compressed air or gas.

The discharge opening 34 of said nozzle 21 is shown as coaxial with the discharge opening 35 of said nozzle 22, and the distance therebetween may be adjusted by means of the screw threads at the inner end of said nozzle 22 and on the exterior of said plug 20, whereby said nozzle 22 may be moved lengthwise said plug 20, when it is turned thereon, and secured in any desired position by means of said locknut 24 as above described, thereby varying and adjusting the action of the atomizer or sprayer.

During the normal operation of my atomizer or sprayer compressed air or gas is occupying the upper part of the container 11, as well as the chamber 30, the tubes 17 and 31 and the duct 26.

When it is desired promptly to discontinue the operation of the atomizer, it is, therefore, not sufficient merely to discontinue the supply of compressed air or gas through said hose 29 or duct 26, or both, as when the operation of the gas compressor is discontinued, or by shutting off the transmission of the said supply in any manner, because the volume of compressed air or gas in the above described parts of the atomizer will, for some time, continue to discharge liquid 12 through said tubes 32 and nozzle 22.

I, therefore, provide a means for instantaneously releasing the pressure of the air or gas in any part of the atomizer or sprayer; one form of said releasing means is illustrated in Fig. 1 and another form is shown in Fig. 4.

An opening 36 is shown in Figs. 1 and 5, as provided through a boss or seat 42 in the fitting 27; ribs 37 are provided at the inner side of said opening 36, and arranged to permit air or gas to pass therebetween.

The inner ends of said ribs may terminate in a circular guide or socket 38 as shown in Fig. 5.

A stem 39 is slidably mounted in said socket 38, and is shown as terminating at its outer end in a thumb plate or push button 40; a disc 41, which may be of leather or any other suitable material, is shown as provided on the inner side of said plate 40, to form therewith a valve, for closing said opening 36 in said seat 42.

The valve 41—40 may be kept in the position shown in Fig. 1 by means of a compression spring 43, which is shown as abutting at one end thereof against a collar 44 on said stem 39 and at the other end thereof against a bracket 45, which is positioned inside of said fitting 27 and may be secured thereto by means of suitable screws or rivets; the lower end of said bracket 45 is provided with a socket for the inner end of said stem 39 to slide therein.

During the operation of the atomizer the valve 41—40 may be kept in contact with the seat 42 by means of the hand or finger of the operator, against the pressure of the spring 43, thereby closing the release opening 36; when it is desired suddenly to discontinue the operation of the atomizer or sprayer, the operator relaxes his hand or finger from the plate 40, thereby allowing the

spring 43 instantly to move the stem 39 with the valve 41—40 thereon to the position shown in Fig. 1, thereby uncovering the release opening 36, whereby the pressure of the air or gas in the atomizer or sprayer is instantly removed and the operation of the latter is discontinued at once.

In the modification shown in Fig. 4 the collar 44 has the disc 41 secured thereto, thereby forming a valve for closing a seat 46, formed interiorly of said fitting 27; the spring 43 normally keeps the opening 36 closed by means of the valve 41—44; to uncover the opening 36, the operator has to press on the said plate 40 against the pressure of said spring 43, thereby releasing the pressure of the air or gas in the atomizer or sprayer.

In either of the modifications shown in Figs. 1 and 4, the operation of the atomizer may be instantly discontinued or partly reduced, and the releasing means as well as the pressure of the air or gas are constantly under the control of the operator.

In the modification shown in Fig. 1 the cost of the atomizer may be still further reduced by omitting the stem 39, the plate 40, the valve disc 41, the spring 43, the collar 44 and the bracket 45; the opening 36 may then be kept closed by the pressure of the hand or thumb of the operator against the seat 42; but the use of the above parts is more comfortable for the operator.

The opening 36 instead of being located in the fitting 27 may also be formed in any other convenient part of the atomizer or sprayer where the compressed air or gas may be reached and discharged from.

Many other changes may be made in the details of my atomizer or sprayer without departing from the main scope of my invention, and parts of my invention may be used without other parts. I do not, therefore, restrict myself to the details as shown; but I intend to include also all mechanical equivalents and obvious modifications of the same within the scope of my invention.

I claim as my invention and desire to secure by Letters Patent:

1. In an atomizer or sprayer a closed container for the liquid to be sprayed, a holder for the hand of the operator, distinct from said container, a liquid discharge nozzle, a means for conveying compressed air or gas through said holder to the interior of said container, to press on the surface of the liquid therein, thereby forcing said liquid to be discharged through said nozzle, said holder having therein an opening positioned within reach of said hand, to be controlled by the same, for instantaneously releasing the pressure of said air or gas, thereby discontinuing the discharge of said liquid through said nozzle, a valve, for covering said opening, to be controlled by said operator, a bracket, enclosed by said holder, a stem for said valve, a collar on said stem and a spring abutting at one end thereof against said bracket and at the other end thereof against said collar, thereby normally keeping said valve open during the intervals between the operation of the atomizer or sprayer.

2. In an atomizer or sprayer a closed container for the liquid to be sprayed, a tubular member mounted thereon, a plug in each end of said member, an atomizer air tube passing through said plugs and extending at the forward end thereof beyond one of said plugs, a spray discharge nozzle, secured to the forward end of said member, an air discharge nozzle at the forward end of said tube, encompassed by said spray discharge nozzle, a holder, connected to said member, an air chamber, positioned between said holder and said member, a means for passing air or gas through said holder to said chamber, a means for passing air or gas from said chamber to the surface of the liquid in said container and a means for passing liquid from said container to the interior of said spray nozzle.

3. In an atomizer or sprayer a closed container for the liquid to be sprayed, a tubular member mounted thereon, a plug in each end of said member, an atomizer air tube, passing through said plugs and extending at the forward end thereof beyond one of said plugs, a spray discharge nozzle, secured to the forward end of said member, an air discharge nozzle at the forward end of said tube, encompassed by said spray discharge nozzle, a holder, connected to said member, an air chamber, positioned between said holder and said member, an air pressure tube, extending from said chamber through said member to the interior of said container, a means for psssing air or gas to said chamber and a pair of liquid discharge tubes extending from the interior of said container through said member to the interior of said spray discharge nozzle.

FREDERICK G. MITCHELL.