A. DE VILBISS.

ATOMIZER OR THE LIKE.

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1,140,301.

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Fig. 1.

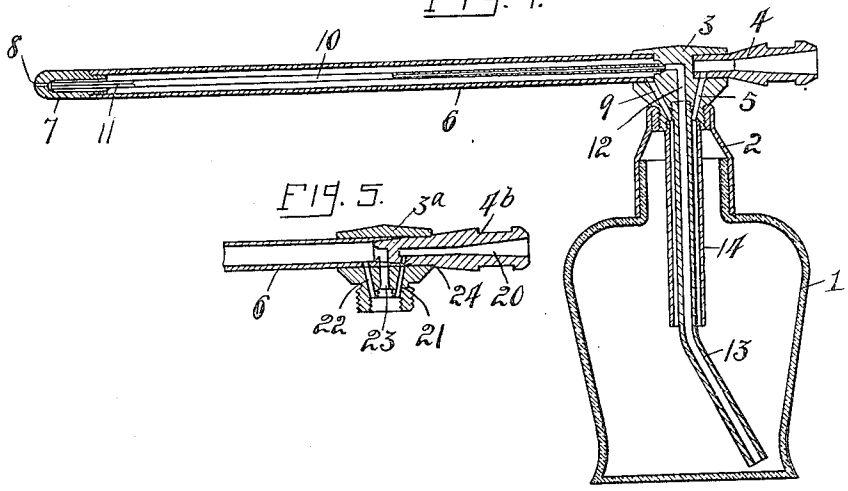


Fig. 5.

Fig. 2.

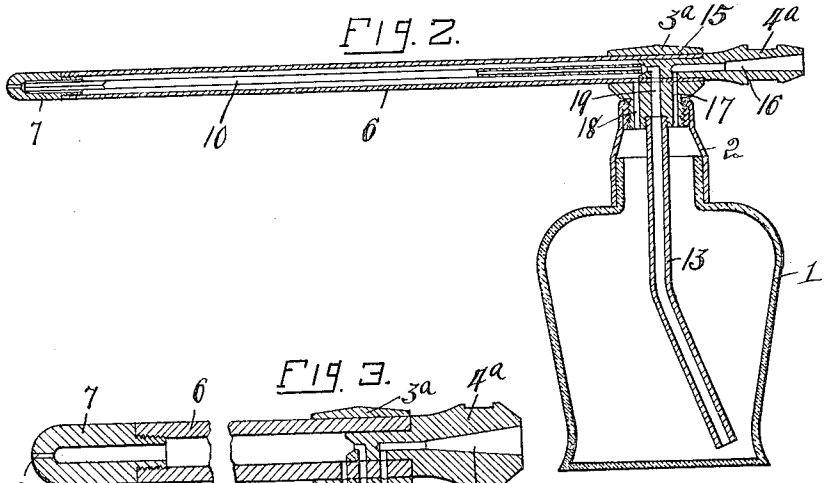
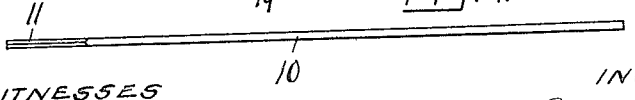


Fig. 3.

Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALLEN DE VILBISS, OF TOLEDO, OHIO, ASSIGNOR TO THE DE VILBISS MANUFACTURING COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

ATOMIZER OR THE LIKE.

1,140,301. Specification of Letters Patent. Patented May 18, 1915.

Application filed December 18, 1913. Serial No. 807,432.

To all whom it may concern:

Be it known that I, ALLEN DE VILBISS, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Atomizer or the like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to spraying or atomizing instruments and particularly to those of the compression type in which air is injected into a liquid receptacle to effect a discharge of liquid therefrom in spray or vapor form, but is not restricted to such use as it may be used in any connection for which it may be adapted or appropriate.

The object of my invention is the provision of an improved instrument of the character described, which is simple and inexpensive in its construction, and has the parts thereof capable of being easily and quickly removed, whereby to enhance the commercial value thereof.

A further object of the invention is the provision of an instrument of this character which has the liquid tubes thereof easily removable from the carrying head to facilitate a cleaning of the spraying parts and also to enable rubber tubes or the like to be used in place of metal tubes when the liquid being discharged has an injurious effect on metals, thus enlarging the scope of use, improving the sanitary conditions, and enhancing the practicability and efficiency of such instruments.

Other objects and advantages of the invention will be apparent from the following detailed description thereof.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, three embodiments thereof are illustrated in the accompanying drawings, in which,—

Figures 1 and 2 are similar sectional views of atomizers embodying slightly different forms of the invention. Fig. 3 is an enlarged detail of a portion of Fig. 2 with the liquid tube removed from within the air discharge tube. Fig. 4 is a side view of the liquid tube removed from the atomizer, and Fig. 5 is a sectional detail of a slightly different form of the invention with the air tube partly broken away and the liquid tube removed therefrom.

Referring to the drawings, 1 designates a liquid receptacle on the open neck of which is mounted a ferrule 2 into which the head carrying the spraying parts of the instrument is secured or otherwise suitably attached as is customary in instruments of this class.

In Fig. 1 the head which carries the spraying parts is designated 3 and has a heel-piece 4 to which a tube (not shown), connecting with a compression bulb or other source of fluid pressure supply, may be attached. The heel-piece 4 has its bore in communication with the interior of the receptacle 1 through a passage 5 in the head, which passage constitutes the only outlet for air pressure in its passage through the heel-piece. Projecting from the head 3 preferably at the opposite side from the heel-piece 4 is an air discharge tube 6, which is fitted at its outer end with a discharge nozzle 7 having a restricted discharge orifice 8 therein, and has its inner end in lateral communication through a passage 9 in the head 3 with the interior of the receptacle.

Disposed within the air tube 6, preferably in concentric relation thereto, is a small liquid-discharge tube 10, which has its outer end fitted into the bore of the nozzle 7 in a manner to permit a discharge of air through the nozzle around such tube, as by making the outer end portion of the tube 10 triangular in cross-section, as shown at 11. The inner end of the tube 10 seats within the mouth or outlet end of a passage 12 in the head 3, which passage communicates at its inner end with a tube 13, which is threaded into the plug or bottom portion of the head 3 with its bore in register with the passage 12 and has its lower end extended down to adjacent to the bottom of the receptacle, as shown. Upon a screwing home of the nozzle 7 within the air tube 6 the restricted outer end portion of the nozzle bore abuts against the outer end of the liquid tube 10 and forces the inner end thereof to a close seat within the enlarged outer end portion of the head passage 12. It is evident with this construction that the liquid

tube 10 can be quickly removed for the purpose of cleaning or for substituting another therefor by simply removing the nozzle 7 from the tube 6 for such purpose.

Depending from the bottom or plug portion of the head 3 in spaced concentric relation to the tube 13 is a tube 14, which is preferably threaded at its upper end into the head 3 and has the annular passage which is formed between it and the tube 13 in communication with both of the air passages 5 and 9 in the head so that air pressure has its inlet to and exit from the receptacle 1 through said tube. The tube 14 extends a considerable distance down into the receptacle 1, and has for its purpose to prevent an escape of liquid from the receptacle through the air passages 5 and 9 upon an inverting of the receptacle 1 or a laying of the same on its side.

In Figs. 2 and 3 the spraying-part carrying-head is designated 3^a and has an opening 15 provided entirely therethrough in transverse relation to the receptacle. The air discharge tube 6 has its inner end fitting into and extending through the opening 15 and the heel-piece 4^a has its inner end projected into the rear or inner end portion of the tube 6. Air under pressure is introduced into the receptacle 1 from the bore 16 of the heel-piece through a channel or passage 17 in the head 3^a and has its exit from the receptacle into the inner end portion of the tube 6 in advance of the heel-piece through a passage 18. The removable liquid discharge tube 10, which is mounted within the air tube 6, has its inner end seating against the inner end of the heel-piece 4^a with its bore in register with the liqud passage 19, which extends through a portion of such heel-piece, the wall of the tube 6 and the head 3^a into the interior of the receptacle 1. A tube 13 extends from the inner end of the passage 19 down into the receptacle nearly to the bottom thereof, such tube being removably threaded to the bottom portion of the head 3^a. In this form of the invention, the heel-piece 4^a and tube 6 are soldered, or otherwise fixedly secured within the opening 15 of the head. The nozzle 7 of this form of the invention is removably attached to the outer end of the tube 6 and serves to removably retain the liquid tube 10 seated at its inner end against the heel-piece 4^a.

In Fig. 5 is illustrated the preferred manner of securing the heel-piece and air-discharge tube to the carrying head. In this form the head, which is substantially the same as that shown in Figs. 2 and 3, is designated 3^a and the air-discharge tube 6 has its inner end fitted into the opening 15 through the head, but preferably terminating short of the rear end of such opening, while the heel-piece which is designated 4^b has its inner end portion tapered to adapt it when inserted into the rear end of the opening 15 to be forced into the inner or rear end of the tube 6 and to have a wedge or expanding action thereon, thus securely fixing the heel-piece and air-discharge tube together within the carrying head in rigid relation thereto. The heel-piece 4^b is preferably provided with a shoulder, as at 24, for coacting with the rear end of the head 3^a to limit the inward movement of the heel-piece therein. The heel-piece 4^b has its air inlet passage 20 extended part way therethrough and communicating at its inner end portion with the interior of the receptacle on which the head may be mounted through a passage 21 and thence from the receptacle through the outlet air passage 22 in the head to the rear end of the air-tube 6, while the liquid passage from the receptacle through the head is shown at 23 and has its outlet end terminating in the inner end portion of the heel-piece 4^b and opening into the air tube 6 axially thereof whereby to permit a seating of the inner end of a removable liquid tube 10 therein.

It is evident that any one of the forms illustrated herein is exceedingly simple to manufacture, as after a securing of the heel-piece and air-discharge tube together before a mounting of the same within the carrying head, such head is bored to provide the air inlet and outlet passages and the liquid passages within the head and the respective parts through which they pass.

It is also evident that an instrument embodying my invention may have the liquid tubes 10 and 13 thereof of metal, or the metal tubes may be replaced if desired by tubes of rubber or other suitable material capable of withstanding the action of iodin or other metal destroying liquids which might be used in the instrument, thus prolonging the life of instruments of this character and enabling one instrument to be used for different kinds of liquids, as desired, without injurious effect thereon.

I wish it understood that my invention is not limited to any specific form, construction or arrangement of the parts, but that the same is capable of embodiment in numerous forms without departing from the spirit thereof.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is,—

1. In an instrument of the class described, a head, an air tube rigidly projecting from said head and in communication with a source of air supply, said head having a passage in communication at one end with a source of liquid supply and opening at its other end into said air tube, a liquid tube disposed within said air tube and having its inner end removably seating against

the head around the outlet end of said passage, and a nozzle carried by the outer end of the air tube and having thrust contact with the outer end of the liquid tube to retain its inner end seated against the head.

2. In an instrument of the class described, a head having an opening therethrough and air and liquid passages in communication with said opening, an air-discharge tube and a heel-piece projected into said opening from opposite ends thereof and coöperating to secure themselves therein, said tube and heel-piece having their passages in communication with the respective passages in said head.

3. In an instrument of the class described, a liquid receptacle, a head carried thereby and having a plurality of air passages and a liquid passage in communication with the interior of the receptacle, a heel-piece and an air-discharge tube carried by the head and having their bores in communication through the air passages of said head and the interior of the receptacle, and a liquid-discharge tube removably mounted in the air-discharge tube and having its bore in connection with the interior of the receptacle through the liquid passage of the head, and a discharge nozzle for said tubes.

4. In an instrument of the class described, a head having an opening therethrough and liquid and air passages leading transversely therefrom, an air-tube projecting from within said head opening, a heel-piece projected into the air-tube within said opening, said tube and heel-piece having ports in communication with respective air passages of the head, said heel-piece having its inner end provided with a passage in communication with the liquid passage of the head, a liquid-discharge tube seated at its inner end against the inner end of the heel-piece with its bore in communication with the liquid passage therein, and a nozzle for the discharge ends of said tubes.

5. In an instrument of the class described, a liquid receptacle and means forming an air passage in communication at one end with a source of air supply and having a discharge nozzle at its other end, said air passage being formed in part by the interior of the receptacle whereby all of the air passing through said passage enters the receptacle, and means coöperating with said first means to form a liquid discharge passage leading from the interior of the receptacle to said nozzle.

In testimony whereof, I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

ALLEN DE VILBISS.

Witnesses:
S. T. KLOTZ,
F. E. AUL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."