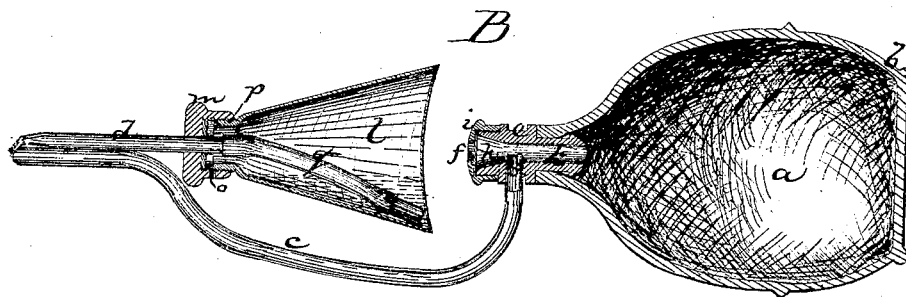
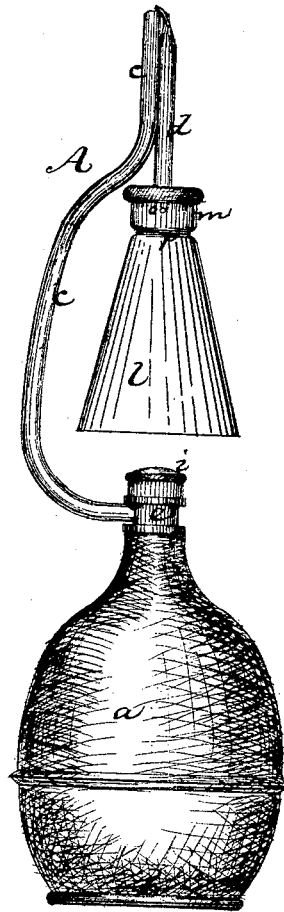


A. M. SHURTLEFF.

Improvement in Apparatus for Atomizing Liquids.

No. 114,482.

Patented May 2, 1871.



Witnesses. { Mr. W. Frothingham.
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Letters Patent No. 114,482, dated May 2, 1871.

IMPROVEMENT IN APPARATUS FOR ATOMIZING LIQUIDS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ASAHEL M. SHURTLEFF, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Atomizing Apparatus; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My invention has reference to the construction of that class of hand-operating atomizing apparatus in which the current of air is supplied to the air-tube of the atomizer by means of a flexible elastic bulb, the invention relating principally to details of construction and relative arrangement of the parts.

In constructing the improved apparatus I employ, preferably, a bulb formed of caoutchouc compound, and having a base or foot fixed to one end of it, or formed with or as a part of it, the opposite end of this bulb having a neck, into which is inserted or upon which is fixed one end of a metal valve and air-induction and eduction-box or tube, through which box or tube is made an air-inlet, and from which box or tube the air-eduction atomizing-tube leads, said box being provided with a valve-seat and valve, which permit free ingress of air through the box into the bulb, but which prevent exit of the air except through the atomizing-tube.

In axial line with the bulb, and at some distance above or beyond the valve-box or tube, is the liquid-containing cup or vessel, and from the outermost end of this vessel extends the liquid-atomizing tube, (or the liquid-tube of the atomizer,) the cup being connected to the tube by a screw-cap or coupling, and the cup and liquid-tube being connected with and attached to the bulb or its valve-box by the air-tube of the atomizer, which tube is bent to enable the parts to be maintained in proper relative position.

The invention consists in an elastic bulb constituting the base of support of the atomizing apparatus; in the construction of the bulb with an integrally-formed base or foot; in the combination with the bulb of a metal valve-box or valve-tube, through which air is both drawn into the elastic bulb or pump and ejected from said pump; in the direct combination with the atomizing-tube or tubes of the valve-box; in the connection of the liquid-vessel and the bulb, through the medium of the atomizer-tubes and valve-box; in the arrangement of the air-pump or elastic bulb and liquid-cup in axial line; and in certain other details of construction.

The drawing represents an apparatus embodying my improvements.

A shows the apparatus in side elevation.

B is a side and sectional elevation of it.

a denotes the bulb, having a base or foot, *b*, preferably formed as a part of or molded upon one end of the bulb, although it may be attached thereto by a suitable pin, this base or foot enabling the bulb and atomizing-tubes to stand upright, as shown at A.

c denotes the air-tube, and *d* the liquid-tube of the atomizer.

The air-tube *c* extends directly from the upper end of the bulb *a*, or preferably from a coupling-tube, *e*, attached to the top of the bulb.

This tube *e* is preferably the air-inlet and outlet, for which purpose it is provided with an air-induction orifice, *f*, and an air-eduction orifice, *g*, (leading into the air-tube *c*), and between these inlet and outlet-orifices is placed a valve, *h*, the under side of a screw-cap, *i*, (through which the orifice *f* is made,) constituting the valve-seat.

The bulb is attached to the valve-tube by means of a nipple, *k*, at the lower end of the valve-tube, as seen at B.

l denotes the liquid-containing vessel, preferably placed in axial line with the bulb, and between the bulb and the liquid-tube *d*.

The liquid-vessel is connected to the tube *d* by a screw-cap or connector, *m*, to which is fixed and through which extends the tube *d*, and above the cap *m* the atomizing-tubes *c* and *d* are connected, their atomizing-orifices being relatively arranged in the usual manner.

The tube *c* extends from the valve-tube or box *e* by the side of the vessel to the tube *d*, and it, or it and the tube *d*, forms the connection between the bulb and the liquid-vessel.

The tube *d* or a projection from it may extend down to the valve-tube *e*, but the connection shown is preferable.

The screw-cap *m* is provided with an orifice, *o*, by which air can enter the cup or vessel *l* as the liquid is drawn therefrom; and to prevent leakage when the atomizer is not in use, and to regulate the force or amount of spray ejected at the atomizing points the screw-threaded neck *p* of the liquid-vessel is made to screw up into the cap in such manner that the air-orifice may be enlarged or contracted, or may be entirely closed, in which latter case no leakage can occur, even though the instrument be laid upon its side in a trunk or a bureau-drawer.

To obtain the requisite size in the liquid-vessel I form such vessel of frusto-conical shape, or enlarging from the neck to the base, and to enable the liquid to be exhausted from the vessel the tube *d* is provided with a flexible continuation, *q*, the end of which being weighted forces the mouth of the tube *q* to the

lowest part of the vessel by gravity when the instrument is used in horizontal position, as seen at B, thus enabling all the liquid to be drawn out.

It will be observed that the air drawn in at the orifice *f* passes directly by the eduction-orifice *g*, so that any foreign matter collecting about the eduction-orifice will be dislodged by the current of air and prevented from entering the air-tube *c* and clogging the air-passage.

The apparatus thus made or arranged is exceedingly compact and convenient to use, and no care is needed to keep the parts in place.

The liquid-cup is shown as connected to the tube *d* by a screw-threaded metal connection. Instead of such arrangement an elastic stopper may be used, the vessel being pressed upon the stopper and sprung into place between it and the tube *e*, the vessel being then held in place by the elasticity of the stopper and by contact with the tube *e*.

I claim—

1. An atomizer-bulb, formed or provided with a base or foot, *b*, substantially as described.

2. Atomizing-tubes *c* *d*, connected with the bulb by a valve-box or tube, *e*, substantially as shown and described.

3. An atomizing apparatus, the bulb of which is provided at one end with an air-inlet and outlet-tube, and with an inlet and outlet controlling-valve.

4. The air-tube *c*, liquid-tube *d*, and valve-tube *e*, formed as one piece, substantially as shown and described.

5. The valve *h*, in combination with the valve-box *e* and air-tube *c*, arranged with relation to the air-inlet and outlet-orifices, substantially as shown and described.

6. The liquid-vessel *l* and atomizer-tube *d*, arranged in axial line with the bulb.

7. The liquid-vessel *l*, arranged in axial line with the bulb, and between the bulb and the atomizing-orifices.

8. The liquid-vessel, connected with the air-inlet and outlet end of the air-supplying bulb by the atomizing-tube or tubes.

9. The liquid-vessel, connected with the liquid-atomizing tube by a screw-cap or connector, *m*.

10. The air-orifice *o* between the liquid-cup and the liquid-atomizer tube *d*, substantially as shown and described.

11. In an atomizing apparatus, an air-orifice for the liquid-vessel, provided with means for graduating or closing it.

12. In combination with an atomizing apparatus the flexible tube *g*, substantially as described.

13. The arrangement of the air-eduction orifice *g* between the induction-orifice *f* and the bulb *a*, substantially as shown and described.

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Witnesses:

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