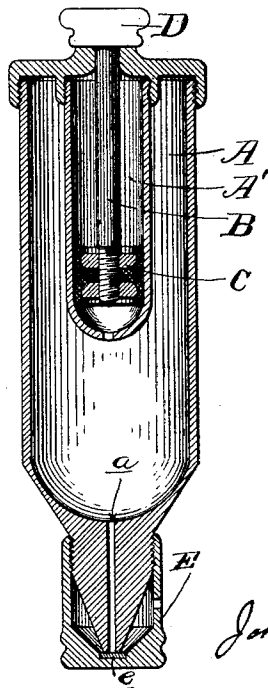


(No Model.)

J. A. GROENINGER.
SYRINGE.

No. 586,657.

Patented July 20, 1897.



Witnesses:

G. A. Pennington

A. R. Cornwall

Inventor:

John A. Groeninger

by Paul Bateman

his Atty.

UNITED STATES PATENT OFFICE.

JOHN A. GROENINGER, OF ST. LOUIS, MISSOURI.

SYRINGE.

SPECIFICATION forming part of Letters Patent No. 586,657, dated July 20, 1897.

Application filed February 28, 1896. Serial No. 581,143. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. GROENINGER, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Syringes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, wherein the figure is a longitudinal sectional view of my improved syringe.

This invention relates to a new and useful improvement in syringes; and it consists in the construction, combination, and arrangement of the various parts, as will be more fully hereinafter described and afterward pointed out in the claims.

The object of the invention is to produce a syringe whereby the liquid to be applied may be carried in the cylinder and ejected in given quantities when desired for use.

In the drawing, A designates the cylinder, which is provided with a contracted opening *a* in one end, through which the liquid is ejected, said end being tapered to a point, as in the well-known form of syringe. The opposite end of the cylinder is provided with a suitable end-closing cap having a central aperture through which passes a piston-rod B, which rod carries on its lower end the plunger C, of well-known construction, the outer end of the rod being provided with a suitable handle D, whereby the piston-rod may be reciprocated in the cylinder.

To load or charge the syringe, the tapered end of the cylinder is inserted into liquid contained in a suitable receptacle and the rod B withdrawn, which sucks the liquid up into the cylinder. The cylinder is now placed in an upright position, with its tapered end up, and the liquid being the heavier will fall to the bottom, the air in the chamber rising above the liquid. The piston-rod is then forced inward, the plunger driving the liquid before it, and the liquid in turn displacing the air and ejecting it from the cylinder through the opening *a*.

To prevent any possible leakage, but more especially to insure against foreign substance entering the opening *a*, I place upon the tapered end of the cylinder a cap E, having a

suitable washer *e*, adapted when the cap is screwed home to tightly seal the opening.

It is obvious that a screw-plug could be used as well as a cap.

When it is desired to eject the liquid, the cap E is removed and the piston-rod is withdrawn to the head of the cylinder, sucking in air above the liquid. The liquid may now be ejected by holding the syringe pointed end downward and gradually forcing in the piston-rod carrying the plunger C, which compresses the air, the compressed air forcing the liquid through the contracted opening, or the piston may be forced downward quickly and held in such position, when the liquid will be ejected by the expansion of the compressed air.

I have shown a form wherein an independent cylinder A' is located within the liquid-containing reservoir and supported by the cap, preferably centrally located relative to the reservoir A. The volume of air or liquid discharged from the cylinder A' determines the amount of liquid ejected through the opening *a*. In this form a great many doses may be conveniently carried in the reservoir A and ejected under pressure at each reciprocation of the piston in cylinder A'.

I am aware that minor changes in the construction and arrangement of the parts of my invention can be made and substituted for those shown and described without in the least departing from the nature and principle of the invention.

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

1. In a syringe, the combination with a suitable reservoir provided with an aperture at its front end only, of a cap for closing the rear end of said reservoir, a cylinder A' extending from said cap into the reservoir, said cylinder being shorter than the reservoir and having at its inner front end a valveless aperture through which it is adapted to discharge into the reservoir, and a plunger arranged within the cylinder A', substantially as described.

2. In a syringe, the combination with a suitable reservoir provided with an apertured nipple at its front end, of a cap for closing said aperture, a cap for closing the rear end of the

reservoir, a cylinder A' on said cap, said cylinder being of smaller dimensions than the reservoir, and apertured and communicating only with the reservoir at its front or inner
5 end, and a plunger in said cylinder A', said plunger not operating directly upon the liquid, but through the medium of air, which it compresses; substantially as described.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 25th day of February, 1896.

JOHN A. GROENINGER.

Witnesses:

F. R. CORNWALL,
HUGH K. WAGNER.