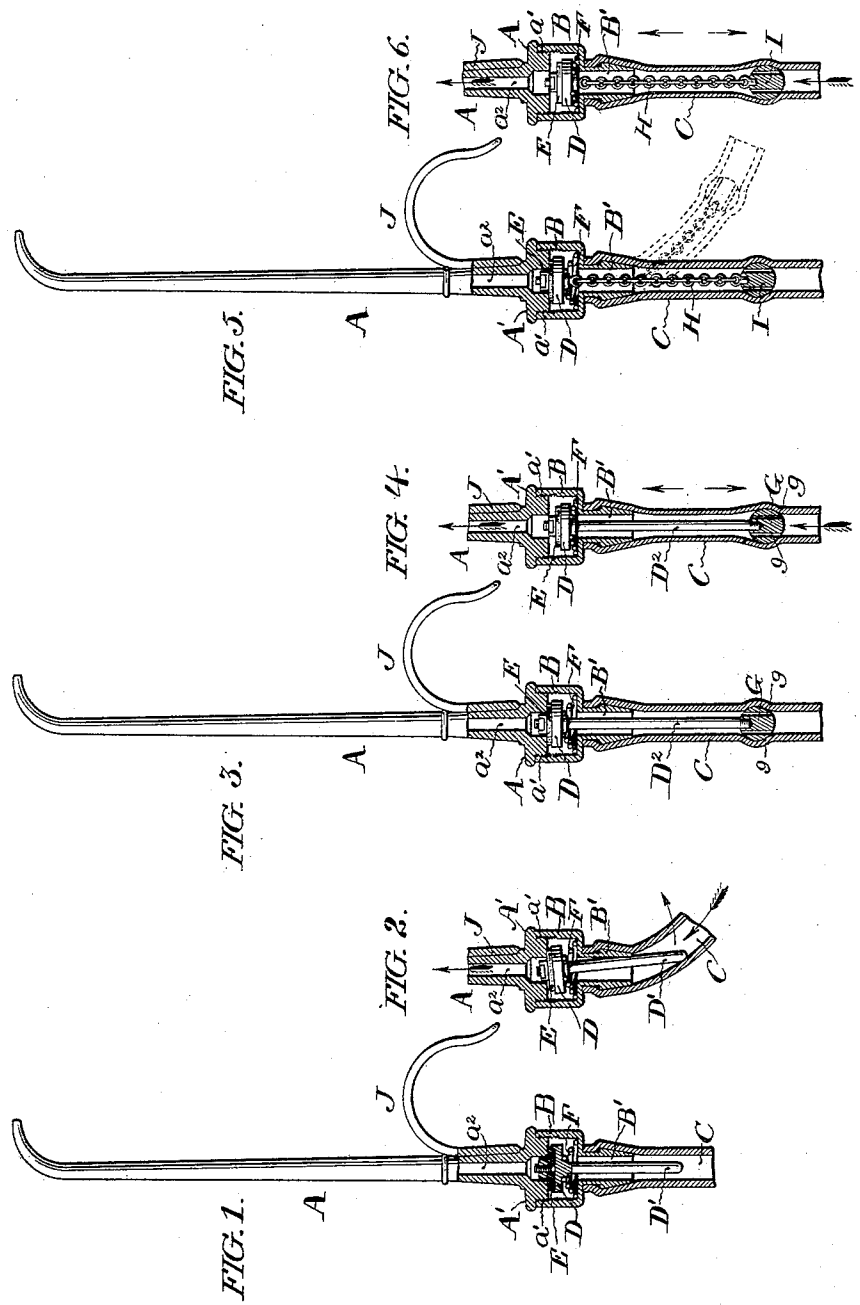
No. 625,434. Patented May 23, 1899.

A. W. BROWNE.

SYRINGE NOZZLE.

(Application filed Feb. 8, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR W. BROWNE, OF NEW YORK, N. Y., ASSIGNOR TO THE S. S. WHITE DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

SYRINGE-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 625,434, dated May 23, 1899.

Application filed February 8, 1899. Serial No. 704,873. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. BROWNE, a citizen of the United States, residing at New York, (Prince's Bay,) in the county of Richmond and State of New York, have invented a certain new and useful Improvement in Syringe or Ejector Nozzles; 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.

My invention relates to syringe or ejector nozzles chiefly intended for use by dentists; and my object is to provide an improved device of this character which is simple in construction and which may be easily and conveniently handled and operated.

The characteristic feature of my invention is a normally-closed valve which may be opened by simple flexure or stretching of the hose or tubing by way of which the nozzle is supplied with liquid.

In the accompanying drawings I have shown three syringe or ejector nozzles illustrating three different embodiments of the principle of my invention.

I will first describe my invention in detail and then specifically point out in the claims what I deem to be new and patentable.

In said drawings, Figure 1 is a view, partly in side elevation and partly in central section, of a syringe or ejector nozzle, showing my improved valve in its normal or closed position. Fig. 2 is a similar view with parts broken away, showing the flexible tubing deflected to one side of the nozzle and the valve unseated thereby. Figs. 3 and 4 are corresponding views of a syringe or ejector nozzle provided with my improved valve of somewhat modified construction. Figs. 5 and 6 are likewise corresponding views of a similar syringe or ejector nozzle provided with still a different form of valve.

Referring to Fig. 1, A represents a syringe or ejector nozzle which may be of any desired form or size. It preferably tapers toward its outer end, where it may be curved, as shown. Its rear end is formed with a circular enlargement A′, which is exteriorly threaded at a'. Screwed upon this threaded enlargement A is the tubular rear section B of the nozzle, which forms the valve-chamber and which is provided with a nipple B′ for the attachment of one end of a flexible tube or hose C, the opposite end of which may be attached to some suitable source of supply of water or other liquid which is to pass through the nozzle. The face of the enlargement A′ forms the seat for a valve D, which when pressed against the face of said enlargement closes the bore a^2 of the nozzle against passage of liquid therethrough. The valve D is preferably a simple disk valve and should be provided with a leather or other suitable washer or facing E. The particular construction of the valve is of no importance, as any well-known or suitable form of valve may be made to answer the same purpose. The valve D is provided with a rigid stem or rod D′, which passes rearwardly through the nipple B′ and extends a suitable distance into the flexible tubing or hose C. A coiled-wire spring F, encircling the valve-stem D′ and bearing at one end against the valve and at its other end against the rear section B of the nozzle, serves to normally press the valve D against its seat.

By flexing the tube in any direction relatively to the nozzle the valve-stem may be moved or rocked to one side of its normal position, whereby the valve is unseated, as illustrated in Fig. 2. Immediately upon allowing the tubing to assume its usual straight or normal position in relation to the nozzle the valve is instantly and automatically closed, owing to the action of the spring F. Obviously the tubing may be flexed to unseat the valve by applying pressure directly to the tubing itsef or by moving the nozzle.

The syringe or ejector nozzle shown in Figs. 3 and 4 is the same as that just described, and the valve mechanism is likewise the same, with the exception that a ball G is secured upon the free end of the rigid valve-stem D^2. This form of valve may be unseated by grasping the tubing at a point where it incloses the ball G and slightly stretching the tubing, as will be obvious from an inspection of Fig. 4. The valve may in this modification be also unseated by flexing the tube, as before described.

In order that the ball G may not obstruct the free passage of liquid through the tubing or hose, said ball should be provided with perforations, as G.

In the modification shown in Figs. 5 and 6 the rigid valve stem or rod D′ is substituted by a flexible stem, shown in the form of a chain H. Secured to the free end of this chain is a ball I similar to the ball G before described. As shown in Fig. 6, the valve in this embodiment of my invention is unseated only by stretching the tubing by grasping the same at the point where it incloses the ball I. Flexure of the tubing relatively to the nozzle does not affect the valve as it does in the other forms of my invention previously described.

If desired, the syringe or ejector nozzle may be provided with a hook J, by means of which it may be supported in proper position when not in use. The screw-threaded connection *a′* between the front and rear sections of the nozzle provides for the ready assembling and separation of the parts and also affords ready access to the valve.

In operation my improved syringe or ejector is connected to a suitable water or other liquid supply by means of its flexible tubing C, the full length of which is not herein shown. As the invention is particularly designed for the use of dentists, the tubing will ordinarily be attached to a suitable cock provided for the purpose upon a dental fountain-cuspidor. When the syringe or ejector is not in actual use, it may lie upon the dentist's table or other surface or be suspended from some part of the cuspidor by means of its hook J, and when in these inoperative positions the valve is tightly closed. When the dentist desires to inject liquid into a tooth or any other part of the mouth, he has but to place the nozzle in the desired position and slightly deflect or stretch the tubing, according to which form of syringe he is using, and the valve is automatically opened to allow a jet of liquid to issue from the nozzle. Upon allowing the nozzle and its tubing to assume their normal relative positions the valve automatically closes and shuts off the flow of liquid.

The extent of flexure or stretching of the tubing necessary to open the valve need be but slight, and the movement of the hand required to accomplish it is a most natural and simple one. In fact, the operation of the valve in both opening and closing might be said to be self-acting, because after a person has familiarized himself with the device the mere act of placing the point of the nozzle in position automatically opens the valve, while the mere act of removing the nozzle from its operative position automatically closes the valve, all without any other movement on the part of the user.

As before stated, I contemplate embodying my improvement in three different forms of syringes or ejectors. In one form the valve may be opened by flexing the tubing. In another form the valve may be opened by either flexing or stretching the tubing, while in still another form the valve may be opened by stretching the tubing only. In either case the valve is opened by changing the relative normal positions of the nozzle and its tubing.

The broad principle of my invention is obviously susceptible of being embodied in other forms than those herein shown and described, and I therefore do not wish to be understood as limiting my invention to such forms only, as I believe myself to be the first to invent a device of the character mentioned in which the valve is automatically opened by varying the normal relative positions of the nozzle and its flexible tubing and automatically closed by permitting the parts to resume their normal relative positions.

I claim as my invention—

1. In a syringe or ejector, the combination of the nozzle, the flexible tubing connected thereto, the normally-closed valve in said nozzle, and means operated by the bending of the tube relatively to the nozzle, whereby the valve is automatically opened, and when the parts are permitted to resume their normal relative positions the valve is automatically closed, substantially as described.

2. In a syringe or ejector, the combination of the nozzle, the flexible tubing connected thereto, the normally-closed valve in said nozzle, and the stem of said valve extending into said flexible tubing, whereby said valve-stem may be actuated to open the valve, by varying the normal relative positions of the nozzle and the flexible tubing, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR W. BROWNE.

Witnesses:
SEYMOUR CASE,
M. A. COLE.