Oct. 4, 1949. C. V. SMITH 2,483,851

SYRINGE

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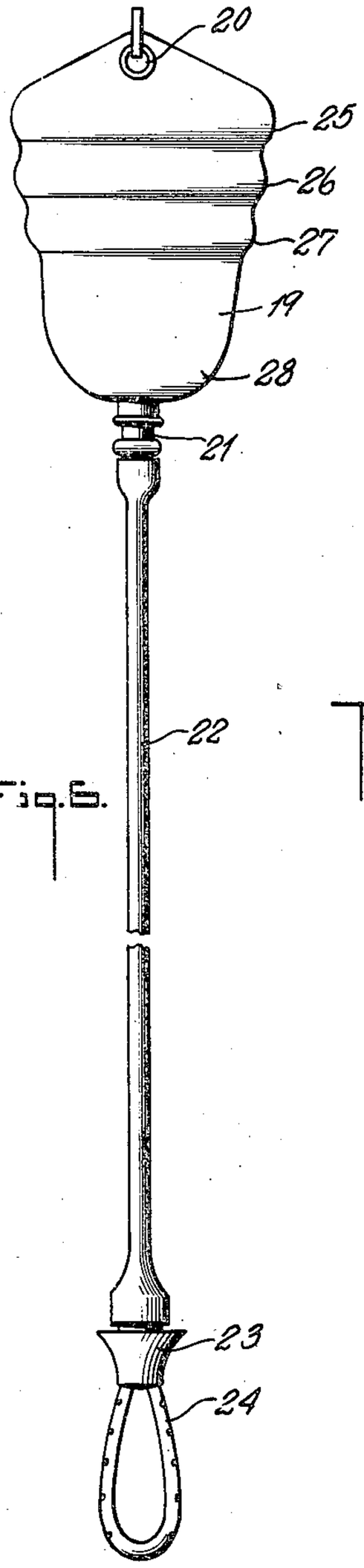

Fig. 6.

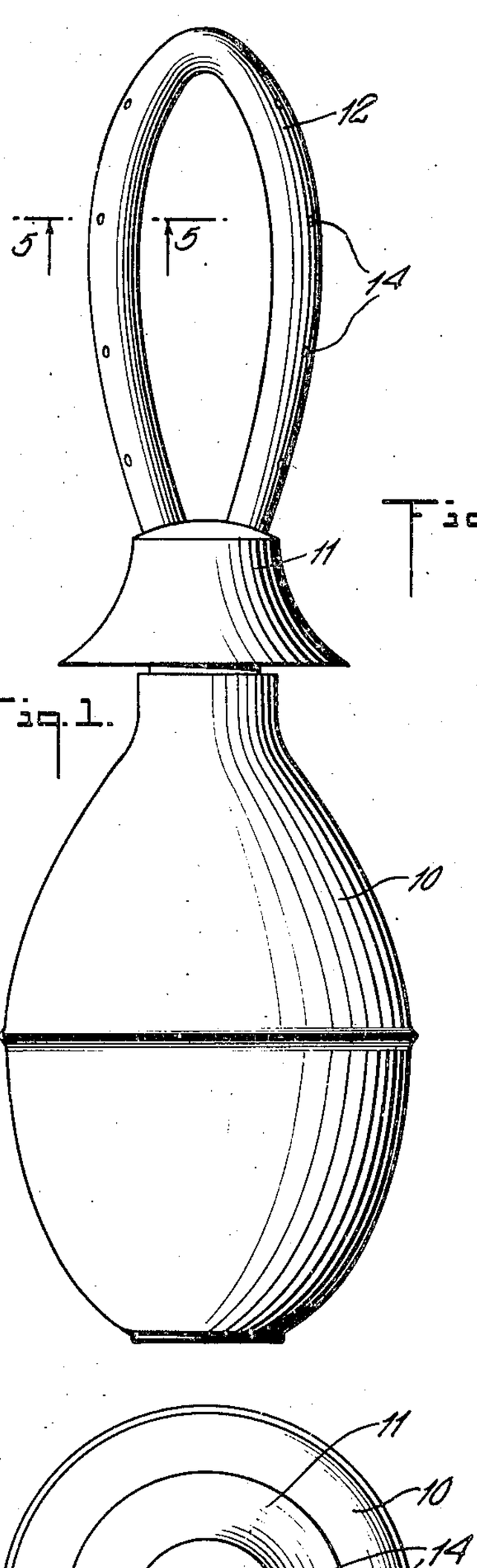

Fig. 1.

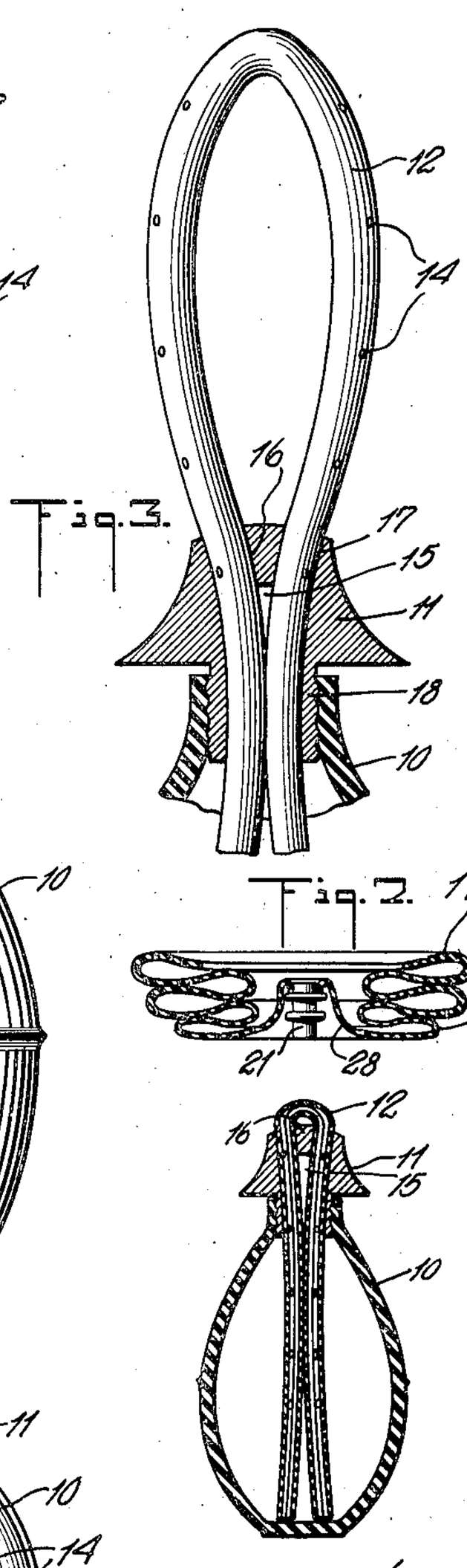

Fig. 3.

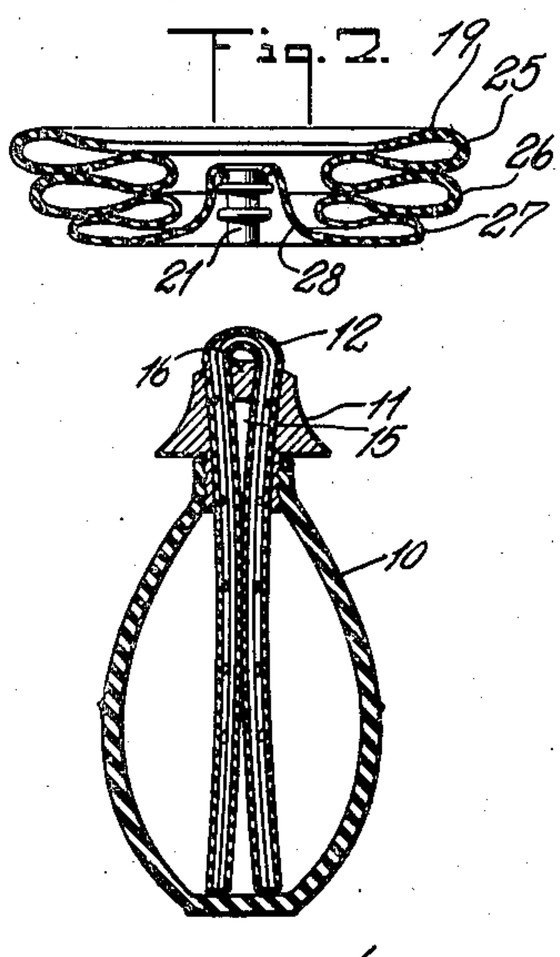

Fig. 2.

Fig. 4.

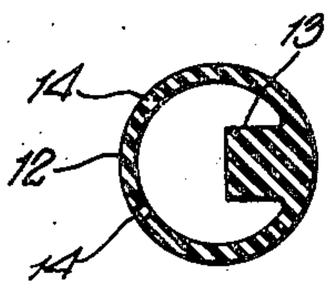

Fig. 5.

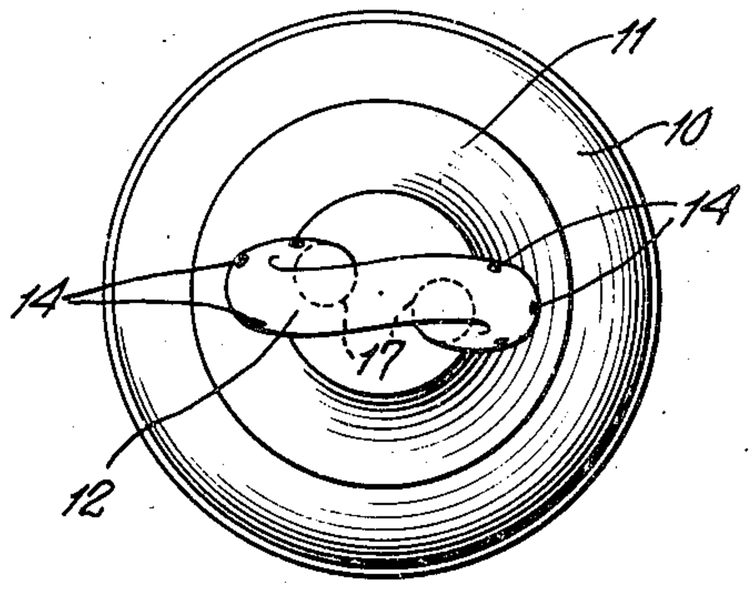

Fig. 2.

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SYRINGE

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2 Claims. (Cl. 128—232)

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My present invention relates to the improvements in syringes.

Heretofore syringes have comprised a rigid tube having a nozzle at the end and supplied with liquid by means of a bulb or by gravity from a supply container.

The rigidity of the tube and the fact that the liquid or solution was supplied at one point, namely the end, imposed certain limitations and disadvantages on syringes of this prior type or construction. Also syringes of this prior construction were generally bulky and in some cases awkward to pack in a small space, as is desirable for traveling.

My present invention provides a syringe which may be conveniently collapsed or confined to a small size or space, and has a stem of greater flexibility from which the liquid or solution may be ejected at spaced intervals throughout the length of the stem. It is also of simple and inexpensive construction.

The various features of my invention are illustrated, by way of example, in the accompanying drawings in which

Fig. 1 is a side view and Fig. 2 an end view of a bulb type of syringe embodying my invention;

Fig. 3 is a longitudinal section of the syringe shown in Fig. 1;

Fig. 4 is a sectional view, on a smaller scale, of the syringe shown in Fig. 2 having a stem pushed into the bulb for shipping or traveling;

Fig. 5 is a cross-section, on a larger scale, of tubing used in the construction of the syringe;

Fig. 6 is a side view of a syringe of the fountain type embodying my invention;

Fig. 7 is a sectional view of the container of the fountain syringe of Fig. 6.

In my present invention I provide a stem in the form of a loop of flexible rubber tubing having openings spaced throughout the length of the tube. The tube may be of the non-kinking type and bent in the form of a loop and has sufficient rigidity to enable it to be placed in narrow passages for use but retaining sufficient flexibility and resiliency to bend readily. With this construction there is less danger of injury to sensitive or delicate tissues or membranes. The flexibility of the loop also enables it to be compressed into a narrow dimension and to spring apart and dilate the tissues.

The ends of the loop extend through a shield or plug, preferably having a pair of passages to receive the ends separately. The ends of the loop projecting through the plug are open to communicate with the interior of the bulb or supply

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container in a fountain type of syringe. The loop may be pulled entirely from the plug or may be pushed into the bulb entirely to seal the bulb and thus reduce the space occupied by the syringe. In this way a bulb syringe may be carried with a full supply of liquid or medicament.

In the common type of syringe the usual type of bag and supply may be employed, but my invention provides an improved type of supply container of flexible material, such as rubber, which may be collapsed to a flat circular form in which the tube may be coiled.

Referring more particularly to Figs. 1 to 4 of the drawings, the invention is illustrated as applied to a bulb type of syringe comprising a bulb 10, of the usual type, in the open end of which is inserted a plug or shield 11 and in which in turn is mounted the ends of a loop of flexible rubber tubing 12 forming the stem or nozzle of the present invention. The tube 12 may be a cylindrical tube and may have a reinforcement, which is shown at 13, Fig. 5, to make the tube non-kinking.

The tube is also provided at spaced intervals with openings 14 through which solution or fluid may be ejected.

The loop formed by the tube may be a flat loop or may be given a light twist, as shown in Fig. 2. Owing to the loop-shape and aided by the ridge 13, if a non-kinking tube is employed, the stem or nozzle thus formed has sufficient stiffness or rigidity to enable it to be inserted easily into a passage for use, and inasmuch as it may be compressed to narrow the width of the loop it will accommodate itself to various conditions of use.

When water or other liquid is forced from the bulb 10 it is ejected from the openings 14 throughout substantially the length of the stem, thus bathing all parts with the solution or liquid.

As shown in Fig. 3 the plug or shield 11 has a central opening 15 and a pair of spaced openings 16 and 17 communicating therewith through which the ends of the loop 12 may be inserted. The open ends of the loop then pass through the large opening or passage 15 extending through a stem 18 of the plug into the interior of the bulb 10 so that there is a free communication from the bulb to the loop.

The tubing of the loop fits sufficiently tightly in the passages 16 and 17 to be liquid-tight, but owing to the flexible nature of the tube it may be pulled out to disassemble it or for cleaning or replacement.

The tube may also be pushed entirely into the bulb, as shown in Fig. 4, in which case it forms a

tight closure inasmuch as the openings 14 will be within the plug 11 or in the bulb itself. The bulb may, therefore, be filled with the treating fluid, and when the loop is pushed into the plug to form a closed seal the syringe may be carried filled without danger of leakage. For use it is only necessary to pull the loop to the position shown in Figs. 1 and 3.

In the embodiment of the invention shown in Figs. 6 and 7, the invention is illustrated as applied to a fountain type of syringe comprising a supply container or bag 19 having a loop or opening 20 at its upper end for mounting on a hook, and having an outlet nipple 21 at its lower end over which the upper end of a supply tube 22 may be mounted.

In the lower end of the tube 22 is inserted a plug 23, similar in construction to the plug 11, for mounting a loop 24. The loop 24 and plug 23 may be of a construction similar or identical with the loop 12.

The supply container or bag 19 may be of any suitable type but preferably a collapsible type which may be collapsed to a circular form as shown in Fig. 7.

For this purpose the bag is made with a number of ridges 25, 26, 27, which preferably are of decreasing diameters, and a lower cup portion 28 from which the nipple 21 extends. When not in use the tube 22 may be detached and the bag collapsed to the form shown in Fig. 7. The tube 22 may then be coiled within the bag, forming a very compact package for shipping.

The tube 22 may be of the non-collapsing type as shown in Fig. 5, it being necessary only to cut back the ridge 13 to enable it to be inserted over

the nipple 21 or neck or extension of the plug 23.

The plug 11 and other parts of the apparatus may be formed of plastic or rubber.

Through the above invention I have provided a syringe of simple construction which may be packed in a small space for traveling and one which has greater flexibility than syringes heretofore used. Also it provides that the liquid may be distributed throughout the length of the stem of the syringe.

What I claim is:

1. A syringe which comprises a plug for attachment to a supply fluid and having a pair of openings therethrough said plug being otherwise closed and a stem comprising a loop of open-ended perforated tubing extending through and filling the openings of said plug.

2. A syringe which comprises a flexible bulb, a plug mounted in said bulb, said plug having a pair of openings therethrough said plug being otherwise closed and a stem comprising a loop of open-ended perforated tubing extending through and filling the openings of said plug.

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