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H. J. DETMERS.

HYPODERMIC SYRINGE.

APPLICATION FILED OCT. 2, 1905.

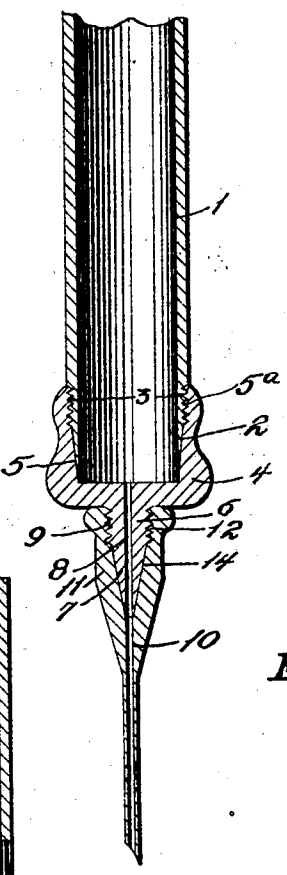

Fig. 1.

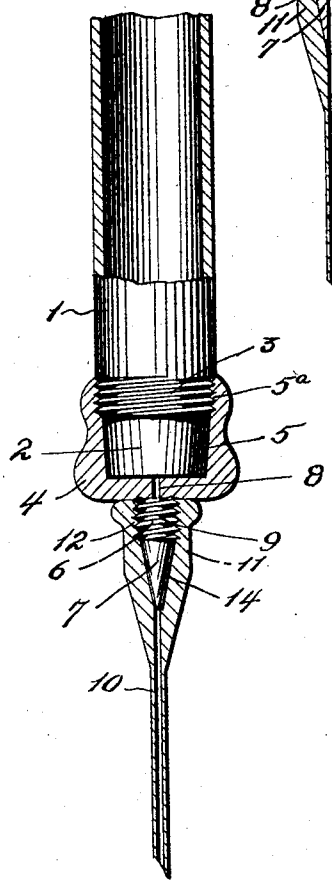

Fig. 2.

WITNESSES:

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HYPODERMIC SYRINGE.

No 836,367. Specification of Letters Patent. Patented Nov. 20, 1906.

Application filed October 2, 1905. Serial No. 280,877.

To all whom it may concern:

Be it known that I, HENRY J. DETMERS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a specification.

My invention relates to new and useful improvements in hypodermic syringes, and has particular relation to the coupling between the parts.

It is a well-known fact that more or less difficulty has been encountered in the construction of hypodermic syringes to obtain or produce air and water tight joints, and while air and water tight joints have been made the result has generally been a complicated structure or one requiring expert mechanical skill to manufacture. It is also a known fact that air and water tight joints may be had if the contacting surfaces of the joint are properly made to perfectly fit.

It is therefore the object of my invention to provide a syringe in which air and water tight joints may be had between the barrel and the cap or adapter and also between the cap and the hub of the needle or nozzle, the said joints being obtained without the use of washers or packing, but by the arrangement and construction of the parts, as will be hereinafter more fully described and pointed out.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein—

Figure 1 is a partial longitudinal sectional view of my improved syringe, the plunger and a portion of the barrel being omitted. Fig. 2 is a similar view, a portion of the barrel and the nipple of the cap being shown in elevation.

In the drawings the numeral 1 designates the barrel or cylinder, which may be formed of metal or any other suitable material. The usual plunger which operates in the barrel has been omitted for the sake of clearness, as it is not needed for a full understanding of the invention. The lower end of the barrel 1 is tapered to a knife-edge, so as to produce an outer conical surface 2, which is surmounted by peripheral screw-threads 3. The reduced or conical end of the barrel is adapted to be received in the socket portion of a cap or adapter 4, which is provided with an upwardly-tapered or conical surface 5, conforming to the conical surface 2, and provided with internal screw-threads 5^a, so that when the cap is screwed into position, the threads 5^a engaging the threads 3, the conical surfaces will be drawn into close contact and an air and water tight joint provided. It will be understood that the conical portions 2 and 5 may be so proportioned that as the cap is drawn onto the barrel by the engagement of the screw-threads the conical end of the barrel will be wedged therein, producing a joint between the contacting surfaces which will be absolutely air and water tight. The cap is formed with a nipple 6, which terminates in a cone-shaped portion 7. A passage 8 extends through the nipple and communicates centrally with the bore of the barrel 1. Peripheral screw-threads 9 are formed on the nipple adjacent the cap and extend to the cone-shaped portion 7. A needle or nozzle 10 is formed with a hub portion 11, which is provided with internal screw-threads 12, adapted to be received by the threads 9, and a conical bore 14, conforming to the contour of the cone-shaped body 7. The same principle is herein carried out as is observed in the joint between the barrel and the cap, the cone-shaped portion 7 fitting snugly within the conical bore or recess 14 of the nozzle and the surfaces of the parts being drawn into close relation when the screw-threads are engaged and the hub drawn onto the nipple. The cone-shaped portion 7 also runs to a knife-edge, so that a smooth and continuous joint is produced and the passage 8 allowed to register with the bore of the nozzle or needle.

Although air and water tight joints are had and the parts drawn into such close relation as to actually bind on each other, it will be obvious that either the cap or the nozzle may be readily removed and access had to the parts for the purpose of cleansing and inspecting.

I wish it understood that while I have described the joint between the hub of the nozzle and the nipple as applied to hypodermic and other syringes the same may be employed in connection with other devices wherein it is desirable to produce water and air tight joints between the nozzle and the part to which it is connected. I also desire to call attention to the fact that the inner horizontal surface 4^a is perfectly flat and at substantially right angles to the sides of the barrel. This affords a better joint and ob-

viates all recesses or depressions in which dirt and bacteria may collect, and when a flat-ended plunger is used the drawing of air-bubbles is prevented. It is further to be noted that the passage 8 has substantially the same diameter as the needle or nozzle 10 and the outlet formed by the passage and the needle is smooth and continuous and without recesses or enlargements. This is accomplished by tapering the conical portion 7 to practically a knife-edge. These features lend materially to the production of a highly-antiseptic syringe.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a hypodermic syringe, the combination with a barrel comprising an open-ended tube, the wall of the lower portion of which tapers in such manner as to form a knife-edge at the bottom of said tube, of a cap adapted to be screwed upon said tube and having a flat-bottomed recess formed therein, the inner wall of said recess conforming to the tapered portion of the tube and the knife-edge contacting with the flat bottom of said recess when the parts are assembled, a nozzle carried by said cap, said cap and said nozzle having openings formed therethrough which register with each other.

2. In a hypodermic syringe, the combination with a barrel comprising an open-ended tube, the lower portion of the outer wall of which tapers in such manner as to produce a knife-edge at the bottom of said tube, of a cap having an outwardly-flaring recess formed therein, said recess having a flat bottom the walls of said recess conforming to the tapering portion of the wall of the tube and having threaded engagement therewith for a portion of its length, the knife-edge formed at the bottom of said tube contacting with the flat bottom of the recess of the cap when the parts are in their assembled position, a nipple projecting from said cap and having a tapering portion, said nipple and cap having an opening formed therethrough, the juncture of the wall of said opening and the tapering wall of the nipple forming a knife-edge, and a nozzle having threaded engagement with a portion of said nipple and having a conical bore adapted to receive the tapering portion of the nipple, said nozzle having an opening formed therethrough which registers with the opening formed through the nipple and cap.

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

HENRY J. DETMERS.

Witnesses:
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