

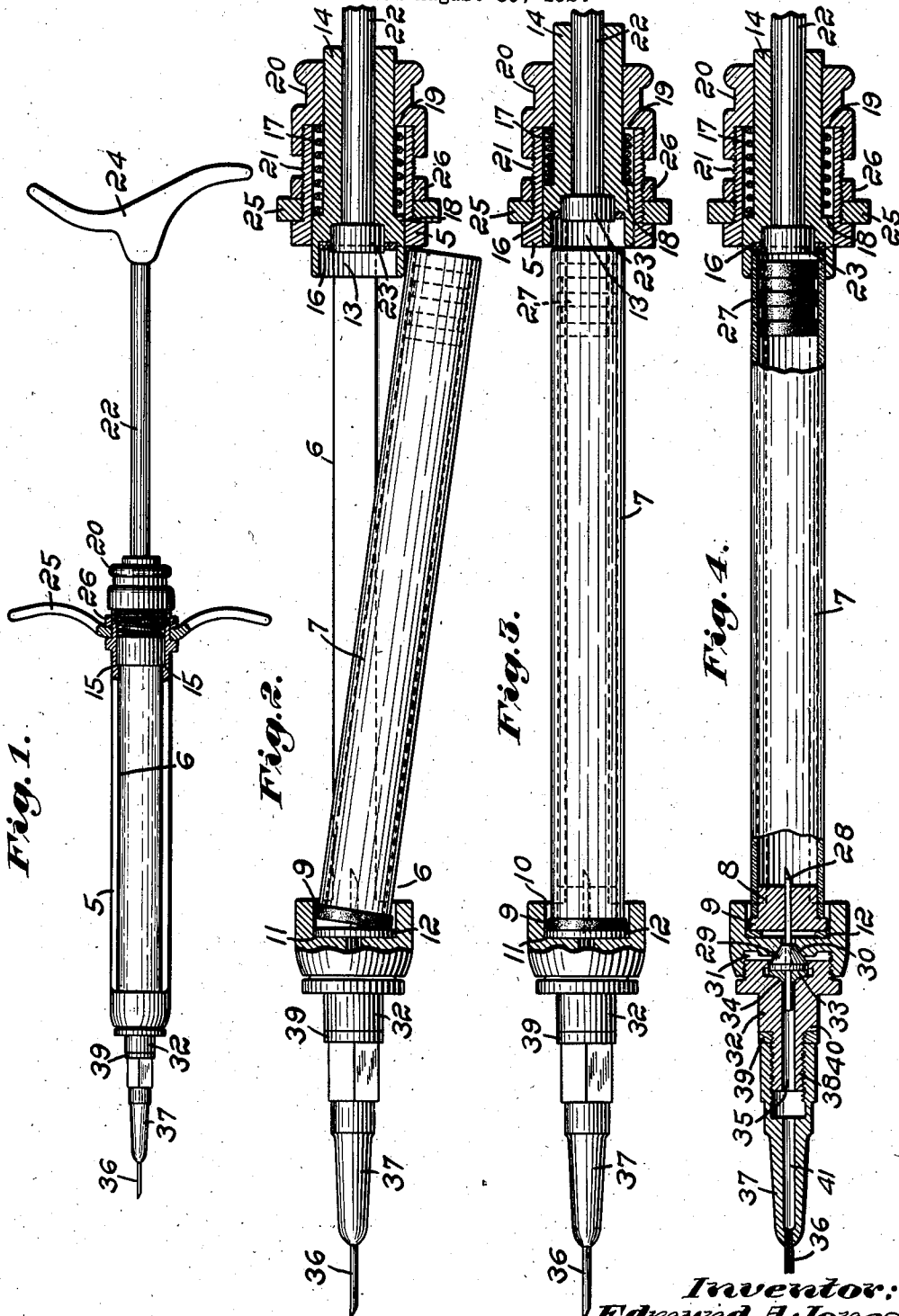
Feb. 23, 1926.

E. A. JONES

1,574,579

SYRINGE

Filed August 30, 1924



Inventor:
Edward A. Jones,
by *Curry, Brett, Jamieson & Harvey* Attys.

UNITED STATES PATENT OFFICE.

EDMUND A. JONES, OF WEST MEDFORD, MASSACHUSETTS.

SYRINGE.

Application filed August 30, 1924. Serial No. 735,182.

To all whom it may concern:

Be it known that I, EDMUND A. JONES, a citizen of the United States, and a resident of West Medford, county of Middlesex, State of Massachusetts, have invented an Improvement in Syringes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a novel and improved syringe of the class in which the fluid to be injected is contained in a tube which can be inserted into a holder from which it can be removed after the injection has been made. The invention will be best understood by reference to the following description when taken in connection with the accompanying drawings of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation, partly in section, of a syringe embodying the invention;

Fig. 2 is a sectional view on an enlarged scale on line 2—2 of Fig. 1, illustrating the first step or movement in loading the tube into the holder;

Fig. 3 is a sectional view similar to Fig. 2 illustrating the second step or movement in loading the tube into the holder; and

Fig. 4 is a sectional view similar to Figs. 2 and 3, illustrating the completely assembled syringe, ready for use, this view also illustrating in section the separate needles, one for penetrating the flesh and the other for penetrating the soft closure of the forward end of the tube.

Referring to the drawings and to the embodiment of the invention which is selected for exemplification, the syringe comprises a frame or holder 5 presenting two lateral openings 6, through either of which a capsule comprising a glass tube 7 may be introduced into and withdrawn from the holder, while the other of said openings serves to admit the user's finger or fingers when manipulating the capsule. The capsule presents at its forward end a closure such as a rubber plug 8 having a head 9, which prevents the plug from sliding too far into the tube. This plug is received in a recess 10 and is seated endwise against an abutment 11 presented by the holder, and if desired, a

washer 12 may be interposed between said plug and said abutment.

The rear end of the capsule is retained in and centered by the walls of a recess 13 presented by a sleeve 14, forward movement of which is limited by an appropriate stop, herein shoulder 15 (see Fig. 1) presented by the sides of the frame. The sleeve is intended to retain the capsule against lateral movement but is not intended to rest endwise against the capsule. However, as capsules are sometimes too long, I may provide a soft washer 16, of tin for example, to prevent injury of the glass tube. A spring 17, encircling the sleeve and resting at one end against an abutment 18 presented by the sleeve and at its other end against an abutment 19 presented by a cap 20 threaded onto a rearwardly extending boss 21 presented by the frame, urges the sleeve in a forward direction against the shoulders 15 and thus retains the capsule in its proper position. The sleeve is guided by the frame and by the cap. Rearward movement of the sleeve to the position shown in Fig. 3 releases the rear end of the tube and permits the latter to be swung laterally and to be withdrawn through the opening 6 in the holder 5.

In the present embodiment this rearward movement is accomplished by rearward movement of a plunger 22 having a head 23, which causes rearward movement of the plunger to be accompanied by rearward movement of the sleeve in opposition to the yielding resistance presented by the spring. The plunger is provided with a handle 24, while the frame is provided with a handle 25, the latter being mounted on and about the boss 21 and being retained in place thereon by a collar 26 threaded onto said boss.

The head of the plunger is adapted to enter the tube and to engage the rear face of one of a series of closures, herein rubber plugs 27, which constitute a piston, forward movement of which, under the influence of the plunger, causes expulsion of the contents of the tube in a forward direction, through the needles now to be described, reference being had to the left hand end of Fig. 4.

When the capsule is introduced into the holder and is thrust forward by the hand, the rubber cap 8, which closes the forward end of the tube, is punctured by a hollow needle 28. This needle is mounted for con-

venient application to and removal from the frame by providing the needle with a laterally projecting collar 29, herein having a frusto-conical form and being seated against a correspondingly formed seat 30 presented by the forward end of the frame, which also presents a recess 31 into which a needle holder 32 is threaded. A washer 33, which may be made of soft metal such as tin, is interposed between the collar 29 and a seat 34 presented by the inner end of the needle holder. By this means the needle is securely held in place and leakage past the joint is prevented, while still permitting removal of the needle by simply unscrewing the needle holder, and withdrawing the needle in a forward direction. The forward end of the needle is received in an axial bore 35 presented by the needle holder.

A separate and distinct, flesh-penetrating, hollow needle 36 is mounted in its own separate and distinct needle holder 37, which is screwed onto a reduced, threaded shank 38 presented by the needle holder 32, while a washer 39, which may be of soft metal such as tin, interposed between the inner end of the needle holder 37 and a shoulder 40 presented by the needle holder 32 prevents leakage at this joint. This needle holder, like the former, is provided with an axial bore 41 which communicates with that of the former, for the flow of the fluid from the capsule into the flesh. Thus it should be evident that either needle may be replaced without replacement of the other.

The general operation of the syringe should be evident from the foregoing without further description, but will be briefly outlined. To load the syringe, a fresh capsule is introduced through one of the lateral openings into the holder and is pressed forward to cause the penetration of the closure 8 and to bring the forward end of the capsule against the abutment as in Fig. 2. The sleeve is then retracted rearwardly by pulling the plunger rearwardly to the position shown in Fig. 3. The rear end of the capsule can now be swung into place as in Fig. 3 and the plunger then released, whereupon the spring forces the sleeve forward against the stop shoulders 15. The walls of the recess 13 now center and retain the rear end of the capsule against lateral movement. The syringe is then ready for use and its contents may be expelled by pushing the plunger forward. It is evident that the operation of the syringe is simplicity itself, as but two easily made movements are necessary to load and prepare it for use. The construction is such that the parts can be sterilized readily.

Having thus described one embodiment of the invention, but without limiting myself thereto, what I claim and by Letters Patent desire to secure is:

1. In a syringe, the combination of a rigid frame presenting a lateral opening, a guide adjacent its rear end and an abutment adjacent its front end, a tube having one end seated endwise against said abutment and removable laterally through said opening, a rearwardly movable retainer having a recess to receive the other end of said tube, said retainer being longitudinally slidable in said guide, and a plunger for expelling the contents of said tube, and for retracting said retainer to permit the insertion and removal of said tube.

2. In a syringe, the combination of a rigid frame presenting a lateral opening, a guide adjacent its rear end and an abutment adjacent its front end, a tube having one end seated endwise against said abutment and removable laterally through said opening, a rearwardly removable retainer having walls to embrace the other end of said tube, said retainer being longitudinally slidable in said guide, a spring for urging said retainer forward, and a plunger for expelling the contents of said tube, and for retracting said retainer to permit the insertion and removal of said tube.

3. In a syringe, the combination of a frame presenting a lateral opening and an abutment, a tube having one end seated endwise against said abutment and removable laterally through said opening, a rearwardly movable retainer for the other end of said tube, and a plunger for expelling the contents of said tube, said plunger carrying means for retracting said retainer.

4. In a syringe, the combination of a frame presenting a lateral opening, a guide adjacent its rear end and an abutment adjacent its front end, a tube having one end seated endwise against said abutment and removable laterally through said opening, a rearwardly movable retainer for the other end of said tube, said retainer being longitudinally slidable in said guide, a spring normally urging said retainer endwise toward said tube, another guide for said retainer presenting an abutment for the rear end of said spring and removably mounted on the rear end of said frame, and a plunger for expelling the contents of said tube.

5. In a syringe, the combination of a frame presenting a lateral opening and an abutment, a tube having one end seated endwise against said abutment and removable laterally through said opening, a movable retainer for the other end of said tube, a spring normally urging said retainer toward said tube, and a plunger for expelling the contents of said tube, said plunger and said retainer having cooperating means to cause retraction of said plunger to be accompanied by retraction of said retainer against the resistance presented by said spring.

6. In a syringe, the combination of a

holder presenting a lateral opening and an abutment, a tube having one end seated endwise against said abutment and removable laterally through said opening, an endwise movable sleeve presenting a recess which receives the other end of said tube, a spring normally urging said sleeve endwise toward said tube, and a plunger for expelling the contents of said tube, said plunger extending through said sleeve and having means cooperating therewith to cause retraction of said plunger to be accompanied by retraction of said sleeve against the yielding resistance presented by said spring.

7. In a syringe, the combination of a holder presenting a lateral opening and an abutment, a tube having one end seated end-

wise against said abutment and removable laterally through said opening, a guide carried by said holder, an endwise movable sleeve guided by said guide and presenting a lateral retainer for the other end of said tube, a spring having one end seated against an abutment presented by said guide and its other end seated against an abutment presented by said sleeve and urging the latter endwise toward said tube, and a plunger received in said sleeve and having means cooperating therewith to cause retraction of said plunger to be accompanied by retraction of said sleeve against the yielding resistance presented by said spring.

In testimony whereof, I have signed my name to this specification.

EDMUND A. JONES.