March 12, 1929. H. K. NICOLL 1,704,921

CAPSULE FOR HYPODERMIC SYRINGES

Filed Feb. 11, 1924

Fig. 1.

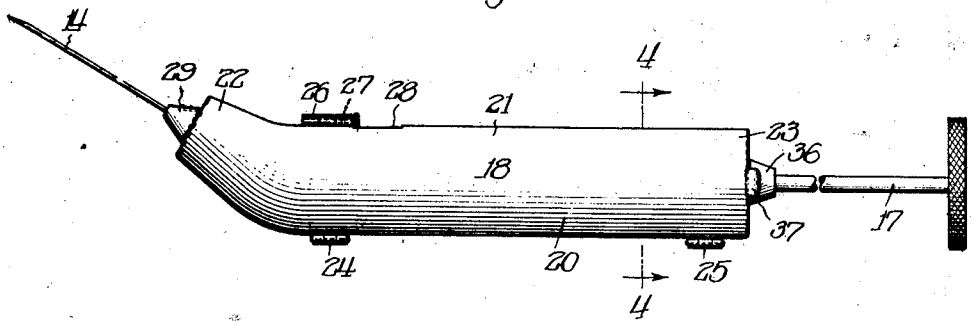


Fig. 2.

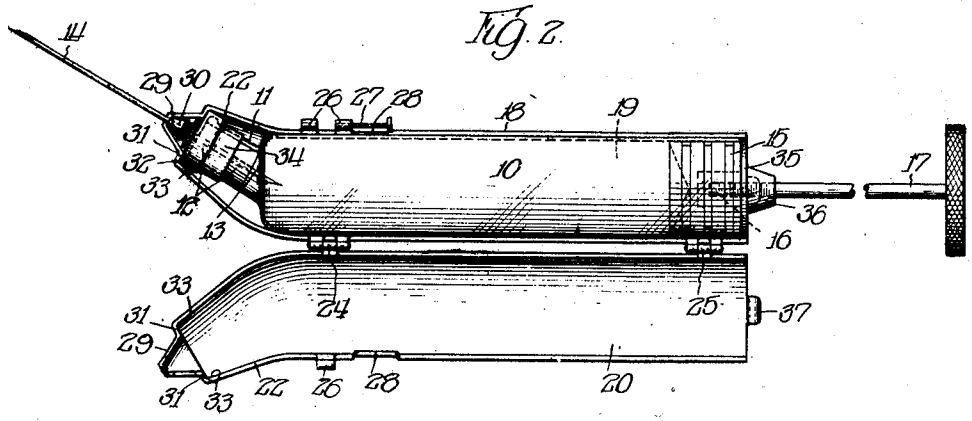


Fig. 3.

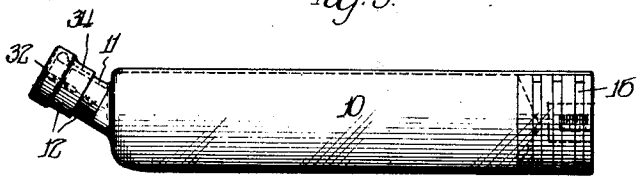


Fig. 4

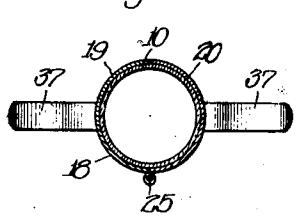


Fig. 5.

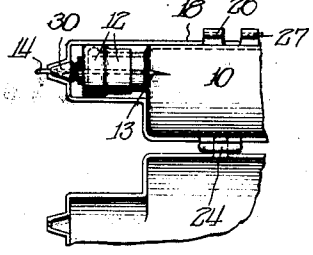
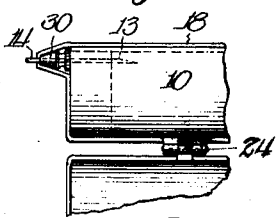


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CAPSULE FOR HYPODERMIC SYRINGES.

Application filed February 11, 1924. Serial No. 691,925.

The invention relates generally to hypodermic syringes of the type wherein the fluid to be ejected from the syringe is contained within a renewable capsule operatively associated with the syringe.

The principal object of the invention is to provide a renewable capsule which may be operatively associated with a syringe in which the axis of the needle is arranged at an angle to the axis of the barrel for the purpose of affording greater visibility in use.

The arrangement, in a hypodermic syringe, of the axis of the needle at an angle to the axis of the barrel, has been employed heretofore in a syringe of the ordinary type wherein the fluid to be ejected from the syringe is directly contained within the barrel. Such an arrangement has also been employed heretofore in a syringe of the capsule type, but, in order to effect such an arrangement in any syringe of the capsule type, it has been found necessary to couple to the straight needle of the syringe another angularly disposed needle by the rather cumbersome instrumentality of an elbow attachment. The capsule of the invention, in operative association with its special holder, provides a syringe which embodies the above mentioned arrangement in a novel and distinctively advantageous form.

While the foregoing statements are indicative of the nature of the invention, other objects and advantages not specifically referred to in this disclosure will be appreciated upon a full comprehension of the novel features presented in the formation and manner of employment of the capsule.

For the purpose of exemplification, one embodiment of the invention is presented in the accompanying drawing and in the following detailed description, but, as numerous other slightly modified embodiments are obviously also within the purview of the invention, the embodiment here presented is not to be considered as limiting the spirit of the invention short of its intended scope as defined by the appended claims.

In the drawing—

Fig. 1 is a side view of a capsule syringe adapted to receive the capsule of the invention;

Fig. 2 is another side view of the capsule syringe, showing the same in open position whereby to expose to view the capsule;

Fig. 3 is a side view of the capsule;

Fig. 4 is a transverse section on the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary side view corresponding to Fig. 2, showing a modified form of the invention; and

Fig. 6 is another fragmentary side view corresponding to Fig. 2, showing a still further modified form of the invention.

The capsule of the invention comprises an open-ended glass tube 10 having a constricted front end portion 11 which is angularly disposed relative to the tube proper, a stationery plug 12 in the front end portion 11 adapted to receive the inner end of a hollow needle 14, and a movable plug 15 in the tube proper adapted to receive the inner end 16 of an elongated handle 17. The salient feature of the capsule is the arrangement of the end portion 11.

The holder 18, with which the capsule may be associated in operative relation to the needle 14 and the handle 17, is an improvement on the holder disclosed in the copending application of Carle C. Quale which was filed September 19, 1923, under Serial Number 663,522.

The holder 18, which is separable to permit insertion or removal of the capsule, comprises two complementary half portions 19 and 20 which, when brought together, form a tube 21 having a centrally apertured front end portion 22 which is angularly disposed relative to the tube proper, and a centrally apertured rear end portion 23.

The half portions 19 and 20 of the holder are separable in the plane which is common to the axis of the front end portion 22 and the axis of the tube proper. The half portions are hinged together at spaced points 24 and 25 on that side of the tube 21 away from which the end portion 22 bends, and are coupled together at a point 26 on the opposite side of the tube by a longitudinally shiftable latching pin 27 which is carried by one of the half portions with its operating head in a travel-limiting recess 28 provided in both of the half portions.

The front end portion 22 of the holder is characterized about the aperture therein by a conical projection 29 adapted to receive

and support a generally conical formation 30 of the needle 14, by an annular shoulder 31 adapted to bear contiguously against the angularly disposed rim of the front end portion 11 of the capsule through an interposed end-flange 32 on the plug 12 of the capsule, and by a conical wall 33 adapted to snugly encompass the front end portion 11 of the capsule through an interposed skirt-flange 34 on the plug 12 of the capsule.

The rear end portion 23 of the holder is characterized by an abrupt end wall 35 in the form of a disc which is carried by one of the half portions 19 and 20 of the holder, by a rearwardly extending conical projection 36 on the end wall 35 adapted to provide a guide for the axial movement of the handle 17 through the aperture in the rear end portion 23 of the holder, and by a pair of laterally extending finger-grips 37.

It is evident, from the foregoing description, that the capsule 10 will fit snugly within the holder 18 upon being moved laterally into the same, and that, in such seated position of the capsule, the angularly disposed rim of the front end 11 of the capsule bears contiguously against the similarly disposed annular shoulder 31 of the holder, the periphery of the front end portion 11 bears laterally against the conical wall 33 of the holder at an angle to the axis of the holder, and the periphery of the tube proper bears laterally against the side wall of the holder. Such seated position of the capsule within the holder presents a reinforcement for the capsule at every point to which stress is brought to bear on the more or less fragile shell of the capsule in the use of the syringe, and provides an interlock between the angularly disposed front end portion 11 of the capsule and the front end portion 22 of the holder which is effective to prevent movement of the capsule longitudinally of the holder. While the abrupt end wall 35 of the holder obviously will prevent movement of the capsule longitudinally of the holder if the capsule is of such exact length as to abut against such end wall in the manner illustrated, the reinforcing interlock of the front end portion 11 of the capsule with the front end portion 22 of the holder eliminates the necessity of always using a capsule which exactly corresponds in length to the chamber of the holder and thereby insures a reinforced positioning within the holder of a capsule which may be produced in large quantities.

In commercial use, the capsule is filled with the liquid to be ejected and the ends of the capsule are closed by the plugs 12 and 15. When it is desired to eject the fluid, the needle 14 is inserted through the plug 12 of the capsule, the needle and capsule are placed as a unit within one of the half portions of the holder, the holder is closed and latched, and the inner screw threaded end of the handle 17 is inserted through the aperture in the end wall 35 of the holder and screwed into an inset in the plug 15. The syringe is then ready for use and the fluid may be ejected through the needle 14 upon movement of the plug 15 forwardly in the bore of the capsule by a corresponding movement of the handle 17.

In Figure 5 is shown a modified form of the capsule 10 and holder 18 wherein the axis of the needle is eccentrically disposed; and in Fig. 6 is shown a still further modified form wherein the axis of the needle is eccentrically disposed.

I claim:

1. A renewable capsule for hypodermic syringes, comprising a glass tube having a constricted front end portion which is disposed at an angle to the tube proper, a stationary plug in the front end portion adapted to receive and support the inner end of a needle in axial alignment with the front end portion, and a movable plug in the tube proper adapted to receive and be propelled by the inner end of a handle in axial alignment with the tube proper.

2. A renewable capsule for hypodermic syringes, comprising a glass tube having a constricted front end portion which is disposed at an angle to the tube proper, said tube being characterized at its ends by bearing surfaces which are disposed at an angle to each other for coaction with conforming portions of an associated syringe.

3. A renewable capsule for hypodermic syringes, comprising a glass tube having a constricted front end portion which is disposed at an angle to the tube proper, said tube being characterized at its front end portion by an end-bearing surface and by a peripheral bearing surface, which bearing surfaces are disposed at different angles to the axis of the tube proper for coaction with conforming portions of an associated syringe.

4. In a hypodermic syringe, a holder for a renewable capsule of angulated form, said holder being of generally similar angulated form and being separable substantially in the plane of angulation to permit lateral insertion or removal of a capsule.

5. A syringe for restricting the shape or type of capsule capable of insertion therein and for facilitating the entry of the needle thereof through the flesh and into the blood vessel of the patient comprising a barrel portion having one end of goose neck formation for receiving a similarly formed capsule with a goose neck end, said goose neck ends permitting contact of the syringe adjacent the needle end thereof with the body of the patient, thereby assisting in the steadying of the physician's hand against the patient.

6. A capsule comprising a receptacle

adapted to contain a predetermined amount of fluid and having an end which is offset with respect to the axis of said receptacle for cooperating with a needle from which the fluid is ejected, said offset end facilitating the entry of the needle through the flesh and into the blood vessel of the patient, and a closure for the opposite end of said capsule for serving as a fluid ejecting means to discharge the contents thereof.

In testimony whereof I have hereunto signed my name.

HOMER K. NICOLL.