

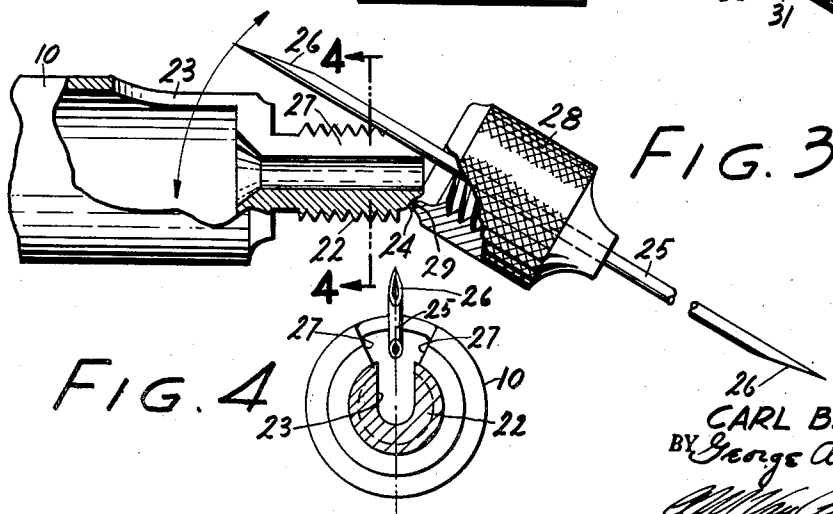
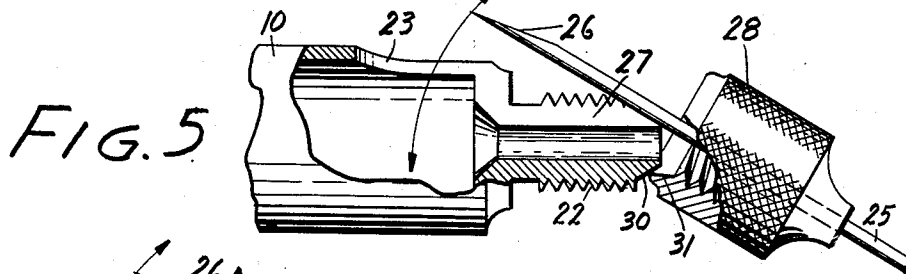
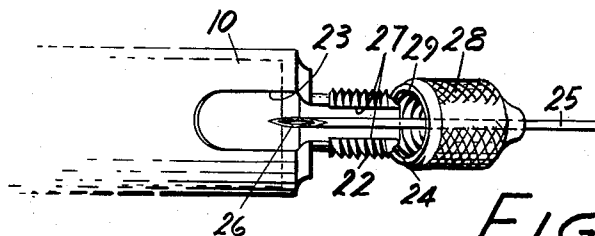
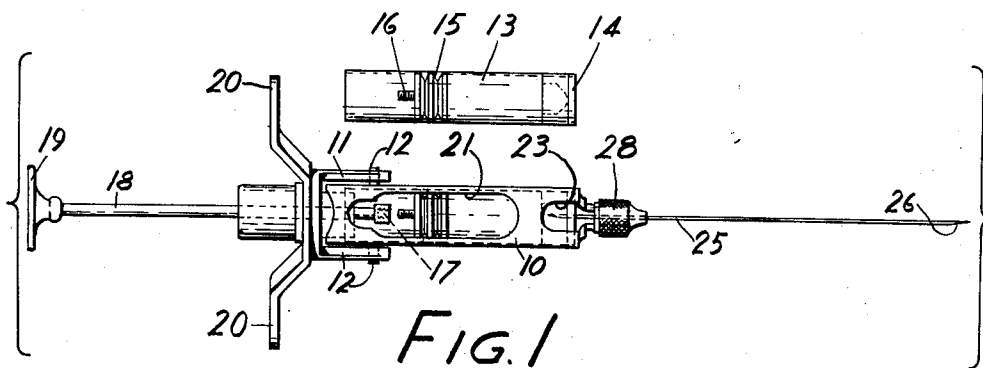
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HYPODERMIC SYRINGE NEEDLE MOUNTING

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HYPODERMIC SYRINGE NEEDLE MOUNTING

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This invention relates to a hypodermic syringe of the ampoule or cartridge type.

It is a general object of the invention to provide an improved hypodermic syringe of the cartridge type by means of which various drugs, serums and the like, may be conveniently, rapidly and aseptically injected.

More particularly the invention is directed to providing a cartridge type of syringe which conveniently and readily lends itself to the aseptical administration of mass immunization injections, i. e., where, for example injections are administered seriatim to persons of a large group to combat the spread of an epidemic or as preventive therapy.

In such mass treatment, it is necessary, of course, that the hypodermic needle and the liquid to be injected be absolutely sterile for each patient. With hypodermic syringes of the cartridge type it has been customary to have the individual cartridges and needles prepared and packaged in sterile condition ready for use in the syringe body or holder. In such mass injections, extreme care must be used to insure that neither the needle nor the cartridge which has just been employed in the injection of one patient, in any manner be permitted to contaminate the syringe barrel or holder during the removal of the used needle and cartridge therefrom. Further aseptic precautions require that a freshly inserted sterile cartridge and newly mounted sterile needle be brought into cooperative association with the cartridge holder without the needle proper contacting any portion of the latter during such insertion and mounting lest the parts be rendered unsterile and unfit for use. Heretofore it has been the practice, in certain instances, to sterilize the syringe cartridge holder preparatory to each individual injection. Obviously, such procedure consumes time and slows down materially the administration of mass injections.

It is an object of the present invention to provide a permanent type hypodermic syringe cartridge holder and a disposable needle and cartridge for use therewith all of which are so constructed and arranged that the assembly of the cartridge and needle into cooperative association with the holder and subsequent disassembly therefrom may be effected with but slight attention on the part of the user, without necessitating repetitious sterilization of the holder and yet in such manner as insures against contamination of the holder with the attendant potential contamination of the needle and/or cartridge contents during these operations; and all of this,

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notwithstanding that the particular injections being administered to a group may involve aspirating preparatory to the completion of the injection in connection with each of the several persons composing the group.

Other objects, features, innovations, elements and combinations of my invention will be discernible from the following description which is to be taken in conjunction with the accompanying drawings.

In the drawings:

Fig. 1 is a side view of the improved syringe showing the cartridge both without and as mounted within the cartridge holder.

Fig. 2 is an enlarged fragmental view of the improved syringe showing the hypodermic needle being mounted thereon.

Fig. 3 is an enlarged fragmental side elevation illustrating in detail a preferred form of the invention.

Fig. 4 is a sectional elevation taken along the line 4—4 of Fig. 3, and

Fig. 5 is a view similar to Fig. 3 but showing a modified form of the invention.

Referring to Fig. 1, the hypodermic syringe therein shown is of the breech-loading type such as that fully disclosed in U. S. Patent No. 1,747,243, issued to Everett L. Hoskins on February 18, 1930. It is to be understood that the invention is not limited to this type of syringe but is equally adaptable for use in connection with any cartridge type of syringe whether the latter be of the breech or end loading or of the side loading type, the particular embodiment of the invention as shown in Fig. 1 being for illustrative purposes only.

This cartridge type of syringe generally includes a tubular body or cartridge holder 10 having pivotally mounted on one end a breech-head 11, the latter having suitable means (not shown) associated therewith for locking the head in the position shown in Fig. 1. The breech-head 11 is swingable about its pivots 12, to one side or the other of holder 10 to permit the insertion within the holder of a cartridge 13, the latter containing the medicament, serum or other liquid that is to be injected. Cartridge 13 is usually formed of a cylindrical glass tube closed at one end by a stopper 14 adapted to be pierced by one end of a hypodermic needle as will hereinafter appear. Interiorly of cartridge 13 adjacent its opposite end, a piston 15 seals the medicament or other liquid within the cartridge.

A threaded shank 16 suitably affixed to piston 15 is adapted to be threadably engaged with the

inner correspondingly threaded end 17 of a plunger 18 mounted for guided, sliding movement within breech-head 11, the opposite or outer end of plunger 18 being provided with a thumb button 19. Finger grips 20 are suitably mounted in association with the breech-head 11. The body of cartridge holder 10 is provided with oppositely disposed elongate slots such as 21 which serve as windows through which cartridge 13 and the quantity of its contents may be observed.

An exteriorly threaded nipple 22 (Fig. 2) of reduced diameter is preferably formed integrally with and projects from the delivery end of holder 10. A relatively wide, continuous slot 23 is provided in the nipple and extends longitudinally from the outer extremity of the nipple into a substantial portion of the body of holder 10 as clearly shown in the drawings. Adjacent to the leading threads of the nipple and at its outer extremity, there is formed a steady-fulcrum 24 which, as shown in Fig. 3, may take the form of a re-entrant curve.

A hypodermic needle 25 of the type generally used with a cartridge holder such as has just been described, generally has oppositely disposed pointed ends 26. The needle is of substantially smaller diameter than the width of slot 23, said slot being preferably at least $3\frac{1}{2}$ times as wide as the diameter of said needle so that ample clearance is provided between the surface of the needle and a pair of walls 27 defining the slot 23. An interiorly threaded collar 28 is affixed to the needle intermediate its ends, the point of affixation being at a lesser distance from the inner end 26 of the needle than the overall length of slot 23. Collar 28 is formed adjacent its leading edge with a complementary fulcrum means in the form of a circular crown 29 adapted to co-operate with the steady-fulcrum 24 as will hereinafter appear.

The procedure for carrying out mass immunization injections of the type described earlier herein is as follows:

The sterile needle is aseptically removed from its wrapper. The user grasps the knurled collar 28 between the fingers of one hand and, supporting holder 10 in the other, brings crown 29 into engagement with the upper portion of the re-entrant curve of steady-fulcrum 24 as shown in Figs. 2 and 3, with the inner end of the needle extending in alignment with the medial longitudinal axis of slot 23 as indicated in Fig. 4. Now, upon a slight rocking action being imparted to collar 29 and utilizing steady-fulcrum 24 and crown 29 co-operatively as piloting guides, the inner end of the needle is introduced spacedly and aseptically within the confines of slot 23, without touching either of its defining walls 27 or any portion of the syringe or holder 10. As the inner end of the needle approaches a horizontal plane, crown 29 is slid slightly downwardly along the re-entrant curve of steady-fulcrum 24 until the leading threads of collar 28 engage the leading threads of nipple 22 at which time the needle will lie precisely in the horizontal plane of the longitudinal axis of holder 10. Following this, the collar is threaded upon the nipple to secure the needle firmly in position on the holder. Next, the breech-head 11 is swung to one side and a cartridge 13 inserted into holder 10 with the stopper 14 of the cartridge presented toward the inwardly projecting end 26 of needle 25, and breech-head 11 is then swung back into the position shown in Fig. 1. Plunger 18 is advanced in holder 10 into threaded engagement with shank 16.

The syringe is now in condition for administering the injection. Following the insertion of the needle into the patient, plunger 18 may be withdrawn slightly to determine by aspiration whether the insertion made by the needle is intravenous or extraveneous and, dependent upon the type of injection that is to be given, the injection may now be forthwith completed or the needle reinserted and aspiration repeated until the desired condition is met for such completion.

Upon completion of the injection the parts are easily and aseptically disassembled in a reverse procedure to that just described, care being taken in removing the needle 25 from holder 10 that the inner end of the needle does not touch walls 27 of slot 23 or any other portion of holder 10 and thereby to invite the possibility of contamination. The next sterile needle and cartridge are assembled in the holder and administered to the next patient and so on.

It will be observed that the necessity for repeated sterilization of the holder is obviated, that the provision of the cooperating fulcrum guides and the wide slot for receiving the needle substantially precludes against the possibility of contamination, and that the aseptic assembly and disassembly may be carried on in a time saving and easy manner.

Although the form of the invention as just described is preferred, the steady fulcrum 24 may take the form of a bevel such as 30 as shown in Fig. 5, instead of the re-entrant curve formation shown in Fig. 3. In such event, the leading edge of collar 28 is provided with a complementary formation and is chamfered as at 31. The operation of this form of invention is carried out in the same manner as described in the foregoing.

While specific embodiments of the invention have been described, it is obvious that modifications may be made therein and it is not desired to limit the invention otherwise than is set forth in the appended claims.

I claim:

1. A hypodermic syringe of the class described comprising, in combination, a cartridge holder having an exteriorly threaded nipple of smaller diameter than said cartridge holder projecting therefrom at one end; said nipple and said cartridge holder having a continuous, longitudinal slot extending from the outer extremity of said nipple into at least a portion of said cartridge holder; said outer extremity of said nipple being formed with a steady-fulcrum; a hypodermic needle of materially lesser diameter than the width of said slot and having an interiorly threaded collar fixed to said needle intermediate its ends; said threads at the inner end of said collar merging into and terminating in a formation complementary to said steady-fulcrum and adapted to rest against said steady-fulcrum when the needle is brought into association with said cartridge holder whereby upon a slight rocking of said complementary formation of said collar on said steady-fulcrum the inwardly projecting end of the needle is moved through an arcuate path and aseptically and positively piloted spacedly within the confines of said slot preparatory to securing the needle and cartridge holder together by threading the collar upon the nipple.

2. A hypodermic syringe of the cartridge type comprising, in combination, a cartridge holder having an exteriorly threaded nipple of smaller diameter than said cartridge holder projecting

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therefrom at one end; said nipple and said cartridge holder having a continuous, longitudinal slot extending from the outer extremity of said nipple into at least a portion of said cartridge holder; said outer extremity of said nipple being formed with a reentrantly curved steady-fulcrum; a hypodermic needle of materially lesser diameter than the width of said slot and having an interiorly threaded collar fixed to said needle intermediate its ends; said threads at the inner end of said collar merging into and terminating in a crowned end adapted to rockably seat on said reentrantly curved steady-fulcrum when the needle is brought into association with said cartridge holder whereby upon a slight rocking of said crowned end on said steady-fulcrum the inwardly projecting end of the needle is moved through an arcuate path and aseptically and positively piloted spacedly within the confines of said slot preparatory to threading the collar upon the nipple.

3. A hypodermic syringe of the cartridge type comprising in combination, a cartridge holder having an exteriorly threaded nipple of smaller diameter than said cartridge holder projecting therefrom at one end; said nipple and said cartridge holder having a continuous, longitudinal slot extending from the outer extremity of said nipple into at least a portion of said cartridge holder; said outer extremity of said nipple being formed with a beveled steady-fulcrum; a hypodermic needle of materially lesser diameter than the width of said slot and having an interiorly threaded collar fixed to said needle intermediate its ends; said threads at the inner end of said collar merging into and terminating in a chamfer corresponding to the bevel of said steady-fulcrum and adapted to rest against said steady-fulcrum when the needle is brought into association with said cartridge holder whereby upon a slight rocking of said chamfer on said steady-fulcrum the inwardly projecting end of the needle is moved through an arcuate path and aseptically and positively piloted spacedly within the confines of said slot without the needle's touching any portion of the cartridge holder.

4. A hypodermic syringe of the cartridge type comprising a hypodermic needle having oppositely

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pointed ends and an internally threaded collar affixed intermediate said ends, a holder for receiving an injection cartridge, said holder having an externally threaded reduced nipple projecting from one end thereof, said nipple and said holder having a continuous longitudinal slot of materially greater diameter than the diameter of said needle extending from the outer extremity of said nipple into a portion of said holder, and fulcrum guide means formed adjacent the outer extremity of said nipple and the leading edge of said collar cooperative upon the needle's being brought into assembly relation with the holder to steady and guide the one with respect to the other and thereby facilitate the piloting of the inwardly extending end of said needle through an arcuate path spacedly and aseptically within said slot preparatory to affixing the needle to the holder as by threading the collar upon the nipple.

5. A hypodermic syringe of the cartridge type comprising a tubular cartridge holder having at one end a breech-loading head for permitting the insertion and removal of a cartridge in and from the holder and at the opposite end a reduced threaded nipple, said nipple having a relatively wide continuous longitudinally disposed slot extending from the outer extremity of said nipple for a substantial distance into said tubular holder, a hypodermic needle having a threaded collar affixed thereto at a distance from one end thereof less than the length of said slot, cooperative fulcruming means formed adjacent the leading threads of said nipple and said collar, respectively; said fulcrum means being coactive to facilitate the guided, spaced, arcuate entrance of said one end of said needle into said slot upon a slight rocking movement being imparted to said collar following the bringing of said fulcrum means into contact one with the other, with said needle in alignment with the medial longitudinal axis of said slot, and a cartridge-operable plunger guidedly mounted for longitudinal sliding movement in said breech head for effecting aspirating or injecting action on said cartridge.

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No references cited.