

March 13, 1956

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2,737,949

DISPOSABLE CARTRIDGE FOR HYPODERMIC SYRINGE

Filed Jan. 4, 1952

3 Sheets-Sheet 1

Fig. 1.

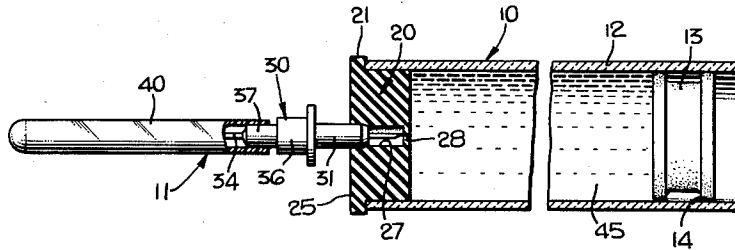
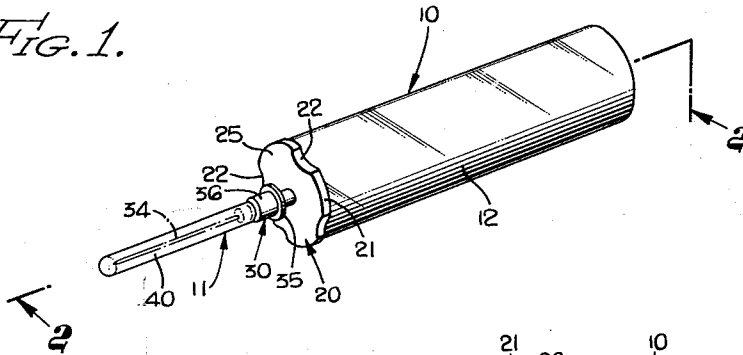


Fig. 2.

Fig. 3.

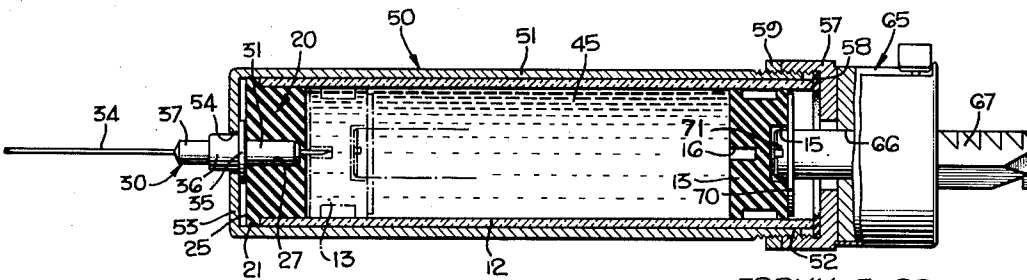
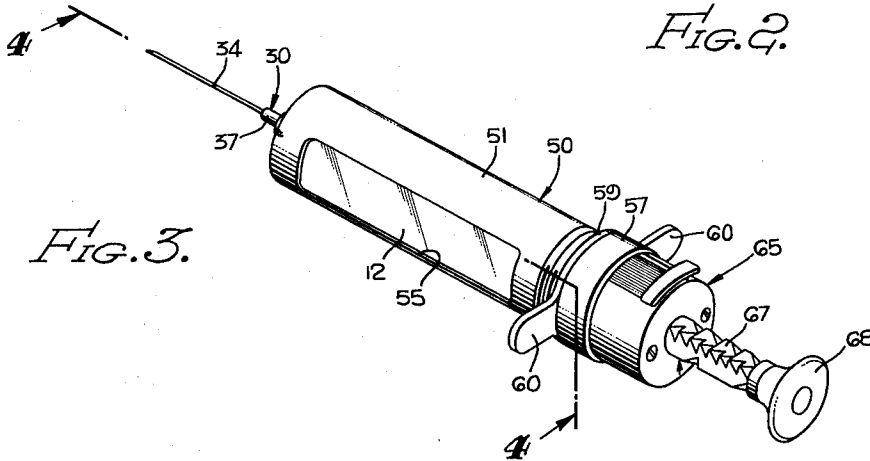


Fig. 4.

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3 Sheets-Sheet 2

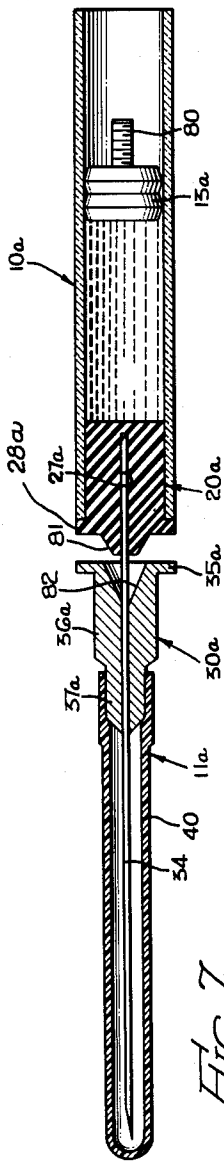


FIG. 7.

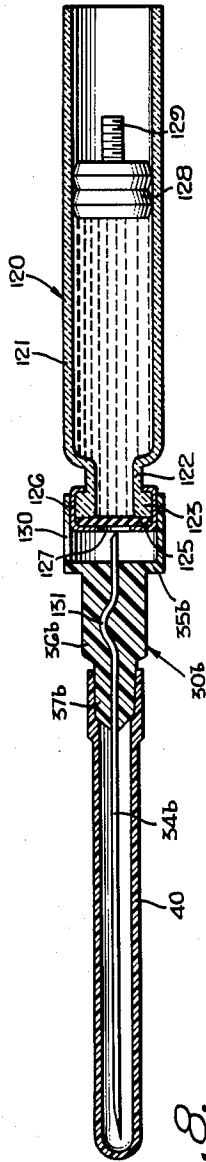


FIG. 8.

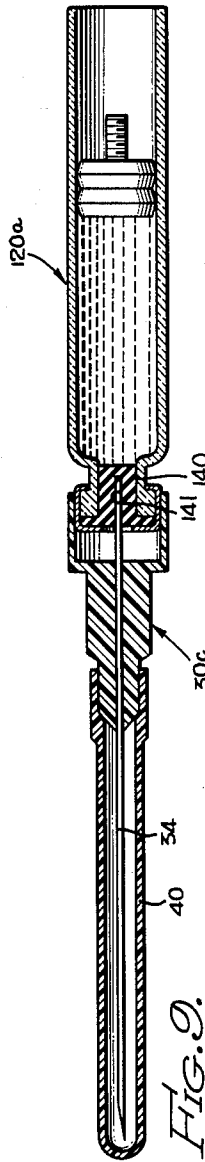


FIG. 9.

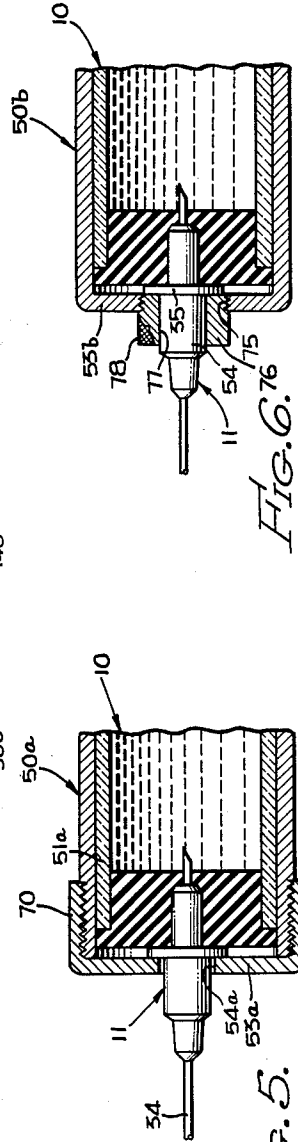


FIG. 5.

FIG. 6.

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3 Sheets-Sheet 3

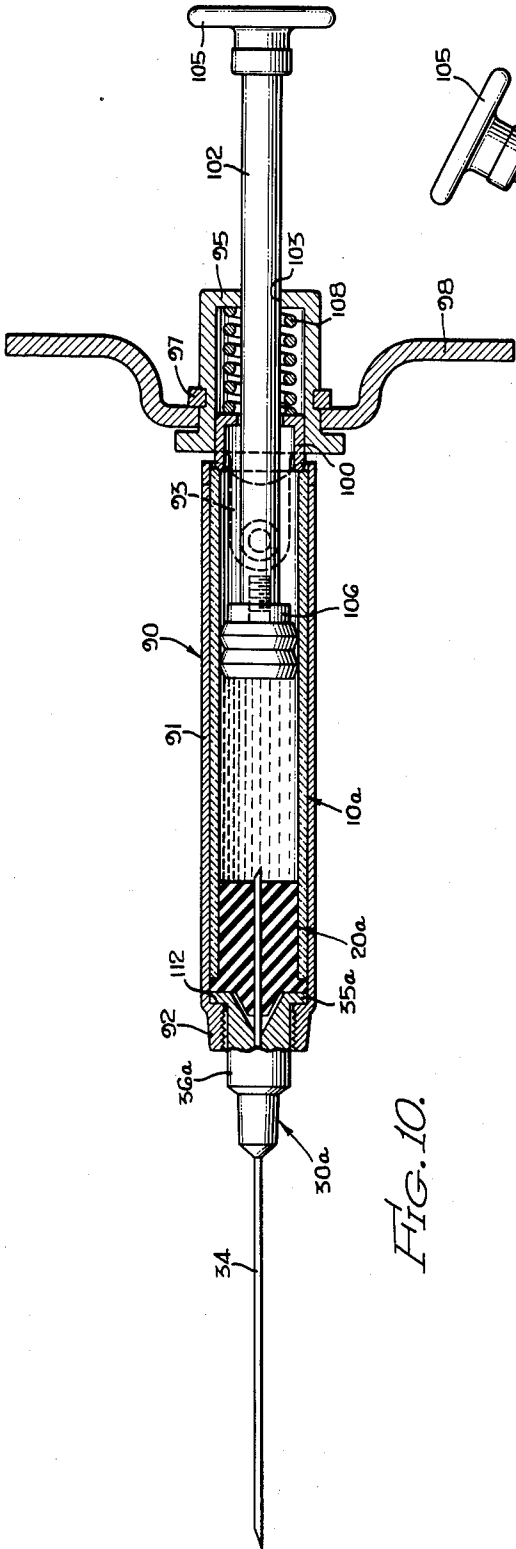


FIG. 10.

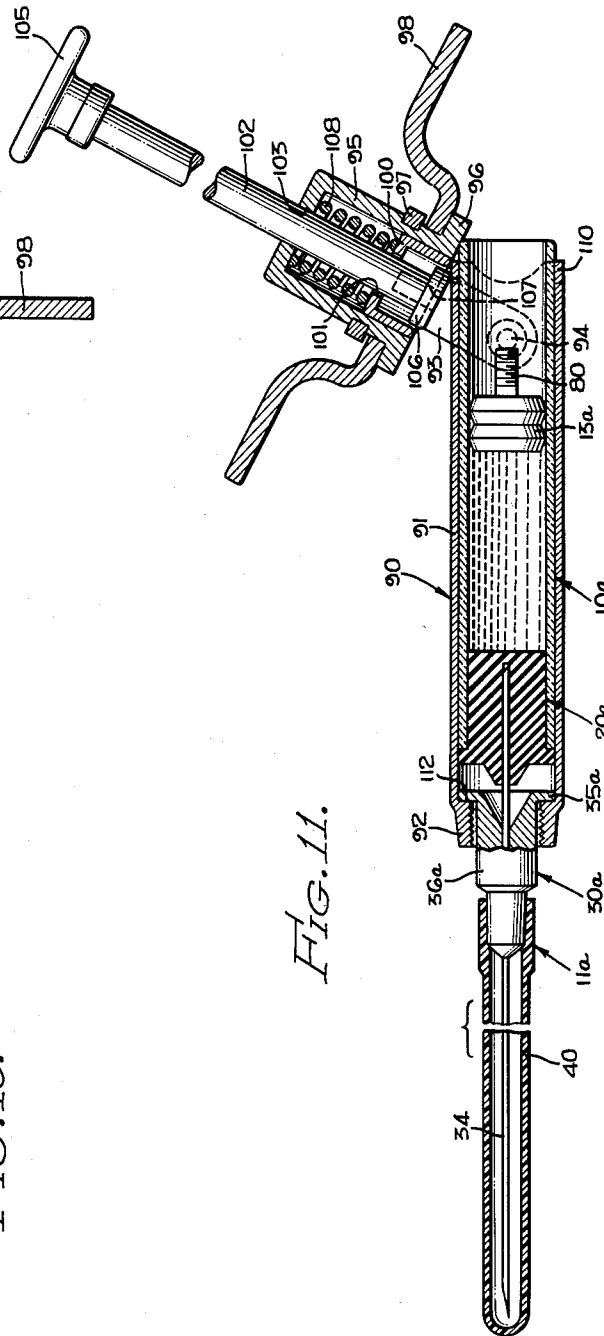


FIG. 11.

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2,737,949

DISPOSABLE CARTRIDGE FOR HYPODERMIC SYRINGE

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Application January 4, 1952, Serial No. 264,992

20 Claims. (Cl. 128—218)

This invention is a continuation-in-part of my copending application for "Disposable Cartridge for Hypodermic Syringe," filed October 25, 1951, and bearing Serial No. 253,046 now abandoned. This invention relates to hypodermic syringes and has particular reference to a prefilled disposable needle and ampule assembly for hypodermic syringes.

Various types of syringes have been heretofore proposed and used which are adapted to be loaded or filled with a cartridge or ampule containing the liquid medication to be injected. In such devices the syringe body is generally provided with a hollow needle which is adapted to perforate the ampule to establish communication with the contents thereof. After use, the exhausted ampule is discarded and the syringe, including the needle, must be sterilized for re-use. While such syringes are satisfactory in operation, they have a number of definite disadvantages other than the fact that sterilization is required before they can be reused. They are often cumbersome to use, requiring a relatively high degree of skill for proper use and maintenance. Where syringes of this type are used for the injection of livestock or other animals, often the operator, being relatively unskilled from a medical standpoint, will use a syringe until the needle becomes exceedingly dull, resulting in improper administration of the medicament and needless laceration of the animal. Additionally, hypodermic syringes of this type are often difficult and expensive in their manufacture. Accordingly, one of the principal objects of this invention is to provide a hypodermic syringe which overcomes these various disadvantages.

Another object of this invention is to provide a novel disposable cartridge or ampule for a hypodermic syringe, the ampule including a disposable needle.

Another object of this invention is to provide a prefilled disposable ampule having a disposable needle operably connected thereto, the needle being arranged to establish communication with the medicament in the ampule upon assembly of the ampule with the syringe body.

Yet another object of this invention is to provide a prefilled disposable ampule and needle assembly which is adapted for use with conventional syringes.

A further object of this invention is to provide a disposable ampule and needle device comprising a hollow tube having a plug or stopper in each end for sealing the medicament against contamination, one of the stoppers being provided with means for retaining a disposable needle in operative position for perforation of the stopper upon assembly of the device in the syringe body, and the other stopper being slidably carried in the tube to act as a piston or plunger in expelling the medicament from the tube via the needle.

Still another object of this invention is to provide a device of the character described which is very simple and easy to operate, and which is also extremely inexpensive to manufacture.

Another important object of this invention is to provide

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a prefilled disposable ampule and needle device which is arranged to permit absolutely sterile technique to be maintained until after the device is assembled with a hypodermic syringe and is ready for use.

5 Another more specific object of this invention is to provide an improved disposable ampule and needle assembly in combination with a conventional one-shot syringe body of the type designed for human use.

Other objects and advantages of this invention it is believed will be readily apparent from the following detailed description of preferred embodiments thereof when read in connection with the accompanying drawings.

In the drawings:

15 Figure 1 is a perspective view illustrating a preferred embodiment of the disposable ampule and needle assembly.

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1.

20 Figure 3 is a perspective view illustrating the device in assembled relation with a preferred type of multiple-dose syringe body.

Figure 4 is a sectional elevation taken substantially on the line 4—4 of Figure 3.

25 Figure 5 is a fragmentary sectional view illustrating the device in assembled relation with a modified form of multiple-dose syringe body.

Figure 6 is a fragmentary sectional view illustrating the device in assembled relation with a further modified form of multiple-dose syringe body.

30 Figure 7 is a vertical sectional view of a modified form of disposable ampule and needle assembly.

Figure 8 is a vertical sectional view of another modified form of disposable ampule and needle assembly.

35 Figure 9 is a vertical sectional view of a further modified form of disposable ampule and needle assembly.

Figure 10 is a vertical sectional view illustrating the device of Figure 7 in assembled relation with a conventional syringe body of the type designed for human use.

40 Figure 11 is a view similar to Figure 10 but illustrating the arrangement of the parts after insertion of the disposable ampule and needle device into the syringe body but before final assembly into operative relation.

Referring now to the drawings, the device which forms a preferred embodiment of this invention includes a cartridge or ampule generally indicated 10, and a needle assembly generally indicated 11 operably connected thereto. The ampule consists of an elongated hollow body member or cylinder 12, closed at one end by a plunger 13 which forms a hermetical seal with the inner wall of the cylinder to function as a stopper as well as a plunger. The plunger is provided with a central annular groove 14 which cooperates with the cylinder wall to form an air space and to thus assist in providing a tight seal, and said plunger is further provided with a pair of axial recesses 15 and 16.

The other end of the cylinder 12 is sealed by means of the stopper member 20 which is provided with an external flange 21 overlapping the end of the cylinder as shown. The outer periphery of the flange 21 is scalloped or provided with inwardly curved portions 22 as shown, for a purpose which will be described hereinafter. The plunger 13 and stopper 20 are preferably formed of conventional medical rubber stopper material, and the cylinder 12 is preferably of transparent glass, although other suitable materials which do not contaminate the medicament contained thereby may of course be used.

45 Extending from the front face 25 of the stopper 20 and axially thereto is a recess 27. This recess is cylindrical and relatively deep, leaving a relatively thin wall portion 28 of the stopper. A needle holder 30 is provided, having at one end thereof a cylindrical portion 31 which extends into the recess 27, the cylindrical portion

being oversized with respect to the diameter of the recess to assure a tight fit, yet the material of the stopper 20 being sufficiently resilient to permit longitudinal movement of the portion 31 therein upon the application of moderate force. A hollow needle 34 extends axially through the holder 39 and is rigidly secured thereto, the needle being provided with a conventional bevelled and sharpened point at each end thereof. As shown, the position of the needle holder is such that the short end of the needle makes contact with the bottom of the recess but does not actually cut into the material of the wall portion 28. This contact is, however, sufficient to tend to more firmly anchor the needle assembly in place, particularly against lateral movement.

The needle holder 39 is provided with a flange 35, a cylindrical stepped portion 36 adjacent to the flange, and a reduced cylindrical end portion 37. Engaged over the end portion 37 in friction fit relationship therewith is an elongated cap or cover member 40 adapted to maintain the needle in sterile condition until it is ready for use.

It will be understood from the above description that a prefilled ampule and needle assembly have been provided. The medicament, indicated at 45, and the sterile hypodermic needle are completely sealed against contamination and are ready for use as will be described in more detail below.

In Figures 3 and 4 the ampule and needle assembly are shown in assembled relation with a multiple-dose syringe body 50 of the type disclosed in my copending application, Serial No. 264,991, filed January 4, 1952, now Patent No. 2,695,023 granted November 23, 1954 on "Hypodermic Syringe." While the ampule and needle assembly is especially well adapted for use in a syringe of this type, it will be understood that it may also be used in more conventional syringes, as will appear hereinafter.

The syringe body 50 includes an ampule casing 51 having a threaded open end 52 and provided at the other end with a wall 53 having an axial opening 54, threaded as shown for attachment of a conventional needle socket member (not shown) when the device is used in the manner described in the aforesaid copending application. The casing 50 is provided with sight openings 55, and visible therethrough is the ampule 12.

A flange member 57 is threadedly engaged with the open end of the casing and maintains the ampule in position, a gasket 58 being interposed between the flange member and the end of the ampule to provide a resilient connection. A nut member 59 is also threaded on the casing and is tightened against the flange member 57 to lock it in the desired position. The nut member is provided with wing elements 60 functioning as finger rest members.

Carried on the end of the flange member 57 is the dosage control and selector assembly 65 which is not here shown nor described in detail, since it forms no part, as such, of the present invention. Mounted for axial reciprocation in the central opening 66 is a plunger or selector rod 67 having a hand rest 68 at the end thereof. The inner end of the rod 67 is provided with an enlarged disk or pusher element 70 secured thereto by means of threaded member 71.

In installing a new ampule and needle assembly in the syringe body, the flange member 57, the dosage control and selector assembly 65, and the plunger rod 67 are removed by unscrewing the flange member from the end of the casing 51. The ampule and needle assembly is then inserted into the casing, needle end first, the needle cap 40 is directed forwardly through the opening 54 in the end of the casing, and the assembly moved forwardly until the flange 35 abuts the end wall 53. The flange 21 on the stopper member 20 is oversized with respect to the inner diameter of the casing 51, providing a tight fit to frictionally hold the ampule in place and preventing the ampule from accidentally slipping out of the casing before completion of the assembly. The inwardly curved por-

tions 22 act as air vents and prevent the creation of increased or reduced pressures during installation or removal of the ampule and needle assembly.

At this point it will be understood that the needle 34 is still in the inoperative position shown in Figures 1 and 2. Continued forward pressure of the assembly will cause the ampule to move forwardly while the needle assembly remains stationary due to the abutment of the flange against the end wall 53, and hence the needle will penetrate the wall portion 28, establishing communication with the interior of the ampule and the medicament contained therein. This final puncturing of the wall portion 28 may be accomplished by the application of thumb or finger pressure to the plunger 13, or the flange member 57 and its associated parts may be reassembled with the casing 51, and the ampule forced to the position shown in Figure 4 by means of the plunger rod 67. As shown in Figure 4, the recess 15 in the rear face of the plunger 13 provides clearance for the head of the threaded member 71. With the device completely assembled, the needle cap 40 is removed and the syringe is ready for use in the customary manner. The recess 16 in the front face of the plunger 13 permits substantially complete evacuation of the medicament from the ampule as shown by the phantom lines of Figure 4. With the plunger at the end of its forward stroke, the inner end of the needle enters into the recess so that communication between the needle and the medicament remaining is maintained.

The syringe is disassembled merely by removing the flange member 57 and its associated parts, and replacing the needle cap 40. The cap and needle holder 30 may then be grasped in the fingers and rearward pressure applied to slide the ampule and needle assembly rearwardly until sufficient of the ampule clears the open end of the casing to permit the ampule to be grasped and the assembly pulled outwardly from the casing. The exhausted ampule and needle assembly may then be discarded and a refill assembly inserted in the casing in the manner described above.

From the above description it will be understood that a disposable ampule and needle assembly has been provided which is easy to use and sufficiently simple in construction to permit economical manufacture. Maintenance of sterile technique is assured until the moment of actual use. This is possible since the medicament is completely sealed by the plunger 13 and stopper 20, and the needle is likewise hermetically sealed from contamination by means of the cover member 40 and the tight fit between the cylindrical portion 31 of the needle holder and the stopper material surrounding the cylindrical recess 27. This sterile condition is maintained until and even after assembly of the device 10 with the syringe body. As indicated, the needle cover member is not removed until after the disposable ampule and needle has been placed into operative position in the syringe body and with the needle in communication with the medicament.

While the device, as illustrated in combination with the multiple-dose syringe body 50, is particularly suitable for use in the injection of livestock and the like, it is apparent that such a combination finds great utility in the treatment of human patients as well.

A modified form of multiple-dose syringe body 50a, especially adapted for use with the disposable ampule and needle assembly, is shown in Figure 5. Here the end wall 53 of the body 50 is modified to provide a detachable end wall 53a having a central aperture 54a. The end of the casing 50a is provided with external threads cooperating with internal threads provided on a skirt 70 integral with the end wall 53a. By means of this structure, the end wall 53a is removable to permit the needle assembly 11 to be removed and replaced with another needle assembly in the event that the needle 34 is damaged during use and before the entire charge of medicament is used, or in the event that the syringe

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is used in the injection of several human patients. Additionally, this structure permits initial assembly of the needle and ampule from the front end of the syringe body, if desired. While relatively fine threads have been shown forming the connection between the casing 50a and the end wall 53a, relatively coarse threads may be provided in order to permit removal of the end wall with only a single turn.

A further modified form of multiple-dose syringe body 50b is shown in Figure 6. Here the end wall 53b is provided with an enlarged central opening 75 which is threaded to receive the external threads of a plug member 76. The plug member is provided with a cylindrical central opening 77 adapted to receive the cylindrical portion 54 of the needle assembly 11. The peripheral surface 78 of the plug member is preferably knurled as shown to provide a finger grip for easy removal of the plug member. Here again, the function of the plug member is to permit removal of the needle assembly, the opening 75 being sufficiently large to permit clearance of the flange 35.

Illustrated in Figure 7 is a modified form of ampule and needle assembly including an ampule 10a and a needle assembly generally indicated 11a operably connected thereto. The ampule 10a is substantially similar to the ampule 10 with the exception that it is proportioned differently to fit a conventional human syringe body as will be described in detail below. The plunger 13a is likewise modified, being provided with a threaded stud member 80. Additionally, the stopper 20a is modified in that the recess 27a is smaller in diameter than the recess 27, being undersize with respect to the diameter of the needle 34 to provide a snug fit therewith but having a wall portion 28a similar to the wall portion 28. The effective length of the recess 27a is increased by means of a central frusto-conical protrusion 81 extending from the end of the stopper 20a.

The needle holder 30a is similar to the holder 30 previously described, being provided with a flange 35a, a cylindrical portion 36a, and a reduced cylindrical end portion 37a, but the cylindrical end portion 31 is eliminated, and the end of the holder 30a is provided with a central conical recess 82 providing clearance for the protrusion 81 when the device is in operative position.

Referring now to Figures 10 and 11, the device of Figure 7 is illustrated in combination with a conventional human syringe body generally indicated 90. This syringe body includes a barrel or casing 91 and is of the commercially available type with which is used a disposable ampule. Such syringes are provided with a threaded end 92 adapted to receive a conventional needle socket member to which is attached a conventional hypodermic needle. For use with this invention, the needle socket member is of course not required and hence the threads in the end 92 are not utilized.

A yoke member 93 is pivotally connected to the casing by means of pins 94, one on each side of the casing. Secured to the yoke member is a cup-shaped instrument head 95 provided with a flange 96, and rotatably carried on the head between the flange and a collar 97 is a finger rest element 98. An annular latch member 100 is slidably carried within the instrument head and is provided with a central opening 101 through which extends the plunger rod 102, an opening 103 for the rod also being provided in the end of the head 95. The plunger rod is provided at one end with a thumb piece 105 and at the other end with a flange 106 and a central threaded hole 107. A helical spring 108 is provided in the head 95 and tends to urge the latch member into the position shown in Figure 10 wherein the instrument head and its related parts are held in the operative position.

In operation, the plunger rod is withdrawn to the limit of its travel whereupon the flange 106 contacts the end of the latch member 100 and forces it rearwardly against the spring 108 until the latch member clears the

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end of the casing 91. The head 95 and its associated parts may now be pivoted to the position shown in Figure 11, wherein the open end 110 of the casing is free to receive the ampule and needle assembly which is inserted, needle end foremost, to the position shown in Figure 11. It will be noted that the needle 34 is still encased in the cover member 40 to maintain sterility, and that the flange 35a is in contact with the end wall or shoulder 112 provided in the syringe casing. It will be further noted that the overall length from the front face of the flange 35a to the end of the ampule 10a is greater than the length of the syringe casing from the shoulder 112 to the other end thereof so that with the device in the position shown in Figure 11 the end of the ampule which protrudes from the end of the casing 91 interferes with the flange 96 on the head 95. A safety feature is thus provided since the instrument head and its related parts cannot be brought back to operative position until the ampule 10a is moved forwardly relative to the needle assembly 30a causing penetration of the wall portion 28a and establishing communication with the medicament contained in the ampule.

This is preferably accomplished by the application of thumb or finger pressure to the protruding end of the ampule, the desired relative motion between the ampule and the needle assembly taking place due to the abutment of the flange 35a against the shoulder 112.

Upon movement of the ampule to the position shown in Figure 10, the instrument head and its related parts may be pivoted to the operative position, and the threads in the hole 107 engaged with the threaded stud 80 by rotating the plunger rod 102. The device is now ready for use. Here again it should be noted that the needle cover member 40 is still in place and the sterile technique maintained. The needle cover member is removed only immediately before use of the syringe.

While the ampule and needle assembly of Figure 7 has been described as proportional to fit a syringe body of the type described in Figures 10 and 11, it is to be understood that the assembly of Figure 7 may be easily adapted to be used in a syringe body of the type shown in Figure 3, merely by appropriate changes in the size of the ampule 10a.

Another modified form of disposable ampule and needle assembly is illustrated in Figure 8. Here the ampule, generally indicated 120, is one of conventional design and of a type which is presently commercially available for use with the syringe body shown in Figures 10 and 11. The ampule includes a glass cylinder 121, open at one end and having a reduced neck portion 122 terminating in an annular lip 123 at the other end. This end of the cylinder is sealed by means of a rubber diaphragm 125 held in place by means of a relatively thin metal ferrule 126 which encases the lip 123 and which is provided with a central aperture 127. The other end of the cylinder is sealed with a plunger 128 having a threaded stud member 129.

The needle holder 30b is similar to the holder 30 previously described, being provided with a flange 35b, a cylindrical portion 36b, and a reduced cylindrical end portion 37b, but the cylindrical end portion 31 is eliminated, and here the flange is provided with a depending annular skirt 130 adapted to fit tightly over the ferrule 126 in sealing relation therewith. Additionally, the holder 30b is molded of a resilient plastic or rubber-like material, rather than a relatively hard material. The fit between the skirt and the ferrule is sufficiently close, as indicated, to form a seal therewith and also to maintain the needle assembly and ampule in assembled relation, but the resilience of the needle holder material is such as to permit relative slidable motion between the skirt and the ferrule upon the application of force in a longitudinal direction.

Due to the resilience of the holder material, the needle 34b is provided with a bend 131 to prevent relative motion between the needle and the holder, and as shown, the needle 34b extends through the needle holder to a point

just short of the diaphragm. The device of Figure 8 is adapted for use with the syringe body 90 in the same manner as the device of Figure 7. Upon initial assembly with the syringe body 90, the flange 35b will abut the shoulder 121, and upon continued forward movement of the ampule 120, the diaphragm 125 will be moved to be pierced by the stationary needle 34 to establish communication with the medicament. Here again, sterility of the instrument is maintained until use since the needle cover member 40 remains in place during the assembly operations.

A further modified form of ampule and needle assembly is illustrated in Figure 9. This device includes an ampule 120a, identical with the ampule 120 with the exception that here the diaphragm 125 is substituted with a flanged stopper member 140 having a central undersize recess 141 adapted to receive the needle 34. The needle holder 30c is substantially identical to the holder 30b with the exception that the needle 34 extends a greater distance through the holder 30c as shown. The device of Figure 9 is in some respects superior to that of Figure 8 in that a more reliable seal is provided for the end of the needle and also in that a less flexible material may be used for the needle holder 30c. The operation of the device is, of course, the same as that of the device of Figure 8.

While I have shown and described specific embodiments of my invention, I do not limit myself to the exact details of the construction set forth, and the invention embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the appended claims.

I claim:

1. In a hypodermic syringe the combination of an elongated hollow casing open at one end and having a wall at the other end with an opening therein, an elongated hollow body member positioned in the hollow portion of said casing and inserted through the open end thereof, a stopper at one end of said body member, said stopper having portions extending outwardly from the body member in friction fit relationship with the casing, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle assembly operably connected to said stopper, said needle assembly including a double-pointed needle extending through said opening, a needle cover member carried on said holder and hermetically sealing said needle, means on said assembly for abutment against said wall, and means for longitudinally moving said body member whereby said needle penetrates through said stopper to establish communication between the needle and the interior of said body member.

2. In a hypodermic syringe the combination of an elongated hollow cylindrical casing open at one end and having a wall at the other end with an opening therein, an elongated hollow cylinder positioned in the hollow portion of said casing and inserted through the open end thereof, a stopper at one end of said cylinder, said stopper having portions extending outwardly from the cylinder in friction fit relationship with the casing, a plunger in the other end of said cylinder, said stopper and said plunger adapted to seal a medicament in said cylinder, a needle assembly operably connected to said stopper, said needle assembly including a double-pointed needle extending through said opening, a needle cover member carried on said holder and hermetically sealing said needle, a flange on said assembly spaced from said stopper and in abutment with said wall, and means for longitudinally moving said cylinder whereby said needle penetrates through said stopper to establish communication between the needle and the interior of said cylinder.

3. In a hypodermic syringe the combination of an elongated hollow cylindrical casing open at one end and having a wall at the other end with an opening therein,

an elongated hollow cylinder positioned in the hollow portion of said casing and inserted through the open end thereof, a stopper at one end of said cylinder, said stopper having portions extending outwardly from the cylinder in friction fit relationship with the casing, and said stopper having a relatively thin wall portion formed by an axial recess in said stopper, a plunger in the other end of said cylinder, said stopper and said plunger adapted to seal a medicament in said cylinder, a needle assembly operably connected to said stopper, said needle assembly having a portion slidably received in said recess and including a double-pointed needle extending through said opening, a needle cover member carried on said holder and hermetically sealing said needle, one end of said needle extending into said recess, means on said assembly for abutment against said wall, and means for longitudinally moving said cylinder whereby said needle penetrates through said stopper to establish communication between the needle and the interior of said cylinder.

4. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a stopper at one end of said body member, said stopper having a relatively thin wall portion, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder operably connected to said ampule, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said stopper, a needle cover member carried on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and means on said needle holder for abutment with the casing end wall.

5. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a stopper at one end of said body member, said stopper having a relatively thin wall portion, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder longitudinally slidably connected to said ampule, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said stopper, a needle cover member carried on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and a flange on said needle holder of greater diameter than said needle cover member and adapted to abut against the casing end wall.

6. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a stopper at one end of said body member, said stopper having a relatively thin wall portion, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder longitudinally slidably connected to said ampule, said needle holder having a reduced cylindrical end portion, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said stopper, a needle cover member releasably secured to said cylindrical end portion on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and a flange on said needle holder, said flange being of greater diameter than said

needle cover member and adapted to abut against the casing end wall.

7. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a stopper at one end of said body member, said stopper having a relatively thin wall portion, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder operably connected to said ampule, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said stopper, a needle cover member carried on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and means on said needle holder for abutment with the casing end wall, the abutment means of said needle holder being spaced from the stoppered end of said body member, and the overall length from said abutment means to the other end of said body member being greater than the length of said casing from the end wall to the other end thereof.

8. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a stopper at one of said body member, said stopper having a relatively thin wall portion, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder longitudinally slidably connected to said ampule, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said stopper, a needle cover member carried on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and a flange on said needle holder of greater diameter than said needle cover member and adapted to abut against the casing end wall, the flange being spaced from the stoppered end of said body member, and the overall length from said flange to the other end of said body member being greater than the length of said casing from the end wall to the other end thereof by an amount substantially equal to the spacing between said flange and said stoppered end of the body member.

9. In a device of the character described for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, the combination of an elongated hollow body member, a stopper at one end of said body member, said stopper having an axial protrusion at one end thereof and a relatively thin wall portion at the other end formed by an axial recess in said stopper, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder having an axial recess adapted to receive said protrusion, a double-pointed needle rigidly carried by said needle holder with one end of said needle extending into said recess in friction fit relationship therewith and contacting the thin wall portion of said stopper, a needle cover member releasably connected to said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the end wall of said casing, and a flange on said needle holder spaced from said stopper, said flange being of greater diameter than said needle cover member.

10. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a stopper at one end of

said body member, said stopper having a relatively thin wall portion formed by an axial recess in said stopper, a plunger in the other end of said body member, said stopper and said plunger adapted to seal a medicament in said body member, a needle holder operably connected to said ampule, a double-pointed needle rigidly carried by said needle holder with one end of said needle extending into said recess in friction fit relationship therewith and contacting the thin wall portion of said stopper, a needle cover member carried on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and means on said needle holder for abutment with the casing end wall.

11. In a device of the character described, the combination of an elongated hollow cylinder having at one end a reduced neck portion terminating in an annular lip, a diaphragm at said one end of said cylinder, a ferrule encasing said lip and retaining said diaphragm, said ferrule having a central opening therein, a plunger in the other end of said cylinder, said diaphragm and said plunger adapted to seal a medicament in said cylinder, a needle holder having a flange with a depending annular skirt slidably carried on said ferrule, said flange being spaced from said diaphragm, a double-pointed needle rigidly carried by said needle holder with one end of said needle poised to pierce said diaphragm, and a needle cover member releasably connected to said needle holder, and hermetically sealing said needle.

12. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow cylinder having at one end a reduced neck portion terminating in an annular lip, a diaphragm at said one end of said cylinder, a ferrule encasing said lip and retaining said diaphragm, said ferrule having a central opening therein, a plunger in the other end of said cylinder, said diaphragm and said plunger adapted to seal a medicament in said cylinder, a needle holder having a flange with a depending annular skirt slidably carried on said ferrule, said flange being spaced from said diaphragm, a double-pointed needle rigidly carried by said needle holder with one end of said needle poised to pierce said diaphragm, and a needle cover member releasably connected to said needle holder and hermetically sealing said needle, said needle cover member adapted to be inserted through the central aperture in said end wall, and said flange adapted to abut against said end wall.

13. In a device of the character described, the combination of an elongated hollow cylinder having at one end a reduced neck portion terminating in an annular lip, a stopper at said one end of said cylinder, said stopper having a relatively thin wall portion formed by an axial recess in said stopper, a ferrule encasing said lip and retaining said stopper, said ferrule having a central opening therein, a plunger in the other end of said cylinder, said stopper and said plunger adapted to seal a medicament in said cylinder, a needle holder having a flange with a depending annular skirt slidably carried on said ferrule, said flange being spaced from said stopper, a double-pointed needle rigidly carried by said needle holder with one end of said needle extending into said recess in friction fit relationship therewith and contacting the thin wall portion of said stopper, and a needle cover member releasably connected to said needle holder and hermetically sealing said needle.

14. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow cylinder having at one end a reduced neck portion terminating in an annular lip, a stopper at said one end of said cylinder, said stopper having a relatively thin

wall portion formed by an axial recess in said stopper, a ferrule encasing said lip and retaining said stopper, said ferrule having a central opening therein, a plunger in the other end of said cylinder, said stopper and said plunger adapted to seal a medicament in said cylinder, a needle holder having a flange with a depending annular skirt slidably carried on said ferrule, said flange being spaced from said stopper, a double-pointed needle rigidly carried by said needle holder with one end of said needle extending into said recess in friction fit relationship therewith and contacting the thin wall portion of said stopper, and a needle cover member releasably connected to said needle holder and hermetically sealing said needle.

15. In a device of the character described, the combination of an elongated hollow cylinder having at one end a reduced neck portion terminating in an annular lip, a plunger in the other end of said cylinder in fluid tight engagement with the internal wall thereof, a ferrule mounted over said annular lip and including an end wall surface enclosing said one end of said cylinder, a perforation in the end wall of said ferrule aligned with the axis of said cylinder, a resilient puncturable seal member disposed within said ferrule and having surfaces tightly contacting the opposing surfaces of said annular lip and said ferrule end wall, said ferrule tightly gripping said annular lip to compress said seal member against the end face of said lip to seal a medicament in said cylinder in cooperation with said plunger, a needle holder having a flange with a depending annular skirt slidably carried on said ferrule, said flange being spaced from said puncturable seal member, a double-pointed needle rigidly carried by said needle holder with one end of the needle positioned to project through said ferrule perforation, and a needle cover member releasably connected to said needle holder and hermetically sealing the other end of said needle.

16. In a device of the character described, the combination of an elongated hollow cylinder having at one end a reduced neck portion terminating in an annular lip, a plunger in the other end of said cylinder in fluid tight engagement with the internal wall thereof, a ferrule mounted over said annular lip and including an end wall surface enclosing said one end of said cylinder, a perforation in the end wall of said ferrule aligned with the axis of said cylinder, a puncturable sealing means carried by said ferrule and having surfaces tightly contacting the opposing surfaces of said annular lip and said ferrule end wall to seal a medicament in said cylinder in cooperation with said plunger, a needle holder having a flange with a depending annular skirt slidably carried on said ferrule, said flange being spaced from said puncturable seal member, a double-pointed needle rigidly carried by said needle holder with one end of the needle positioned to project through said ferrule perforation, and a needle cover member releasably connected to said needle holder and hermetically sealing the other end of said needle.

17. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a puncturable sealing means at one end of said body member, said puncturable sealing means having a relatively thin wall portion, a plunger in the other end of said body member, said puncturable sealing means and said plunger adapted to seal a medicament in said body member, a needle holder longitudinally slidably connected to said ampule, said needle holder having a reduced cylindrical end portion, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said puncturable sealing means, a needle cover member releasably secured to said cylindrical end portion on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and a flange on said needle holder,

said flange being of greater diameter than said needle cover member and adapted to abut against the casing end wall.

18. A disposable ampule and needle assembly for use in combination with a syringe body of the type including a casing having an end wall with a central aperture therein, said assembly comprising an ampule including an elongated hollow body member, a puncturable sealing means at one end of said body member, said puncturable sealing means having a relatively thin wall portion, a plunger in the other end of said body member, said puncturable sealing means and said plunger adapted to seal a medicament in said body member, a needle holder operably connected to said ampule, a double-pointed needle rigidly carried by said needle holder with one end of said needle in position to pierce the thin wall portion of said puncturable sealing means, a needle cover member carried on said needle holder and hermetically sealing said needle, said cover member being adapted to pass through the central aperture in the casing end wall, and means on said needle holder for abutment with the casing end wall.

19. For use with a disposable medicament-containing ampule in a hypodermic syringe including a casing having an end wall with a central aperture therein, said disposable ampule including an elongated hollow body member containing medicament and a puncturable sealing means at one end of said body member in sealing relationship with an annular shoulder, the improvement which comprises a disposable needle assembly adapted to be operatively associated with said disposable ampule and comprising a needle holder of substantially hard material having a stepped cylindrical configuration defining a first lower cylindrical end portion supported from a central cylindrical portion by an intermediate radial shoulder and an upper axially extending tubular skirt integral with said central portion, said tubular skirt being of relatively thin thickness so as to be substantially flexible in a radial direction, an elongated hollow hypodermic needle supported in said needle holder and including a flesh piercing portion extending beyond said lower cylindrical end portion of said holder and a puncturable sealing means piercing end extending slightly beyond the terminus of said annular skirt portion whereby said needle and holder can be presented to said one end of said medicament-containing body member for assembly therewith by simultaneously imbedding said needle in said puncturable sealing means and seating said skirt about said sealed end of said body, and an open ended tubular cover member seated on said lower cylindrical end portion for sealing said flesh piercing portion of said needle against contamination.

20. A disposable needle assembly for use with filled medicament-containing glass cartridges having an open end sealed by a puncturable sealing structure comprising, a needle holder of substantially hard material having a stepped cylindrical configuration including a lower reduced diameter end portion, a central enlarged diameter portion and an integral axially extending tubular skirt portion of substantially larger diameter, said tubular skirt portion having a relatively thin cross-sectional thickness to impart at least some degree of radial play to said skirt for receiving and frictionally gripping the sealed end of the medicament-containing cartridge, a hollow hypodermic needle fixedly mounted in said holder and including an elongated flesh piercing portion extending beneath said lower cylindrical end portion and a relatively short puncturable sealing means piercing portion extending through the center of said tubular skirt to slightly beyond the terminal edge thereof and adapted to be imbedded in the said puncturable sealing means of said disposable cartridge, and an elongated cover member enclosing said flesh piercing portion of said needle including an open end frictionally but movably carried on said lower cylindrical end portion of said holder.

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