

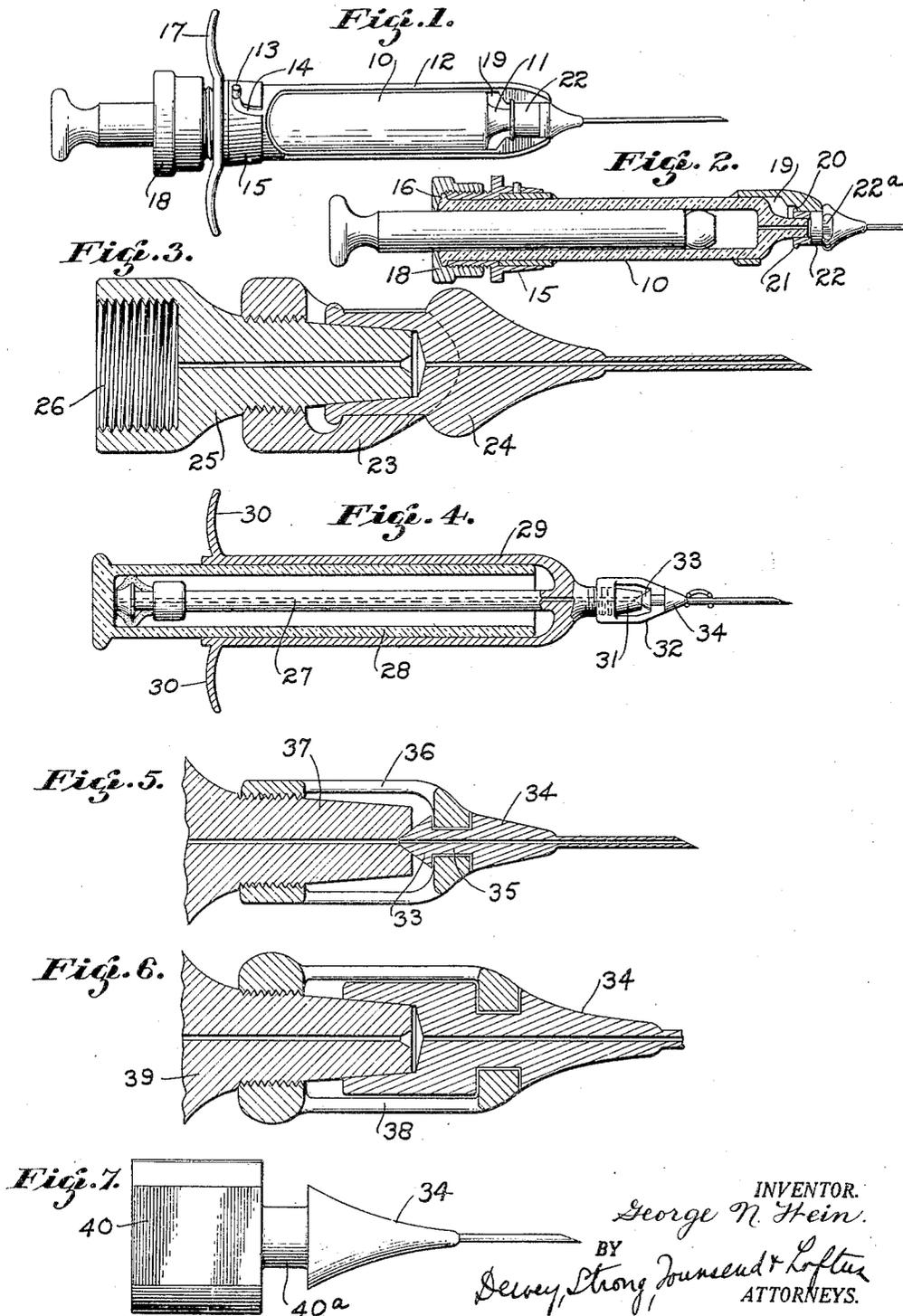
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ADAPTER AND LOCK FOR HYPODERMIC SYRINGES

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ADAPTER AND LOCK FOR HYPODERMIC SYRINGES

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This invention relates to hypodermic syringes and has for its object to provide means for adapting or coupling various types of needles to the barrel or needle of a syringe so as to afford a leak-proof tapered fit which will be securely locked under all conditions of operation.

In my Patent No. 1,532,744, issued April 7, 1925, I disclose a guard for glass barrel syringes which at the same time affords a seat for the needle base and a handle for the operator. Said guard was particularly intended for so-called Luer syringes; that is, a glass barrel having a tapered glass nipple to enter a tapered smooth bore in the base of the needle. The so-called Luer syringes are in extensive use on account of the tapered fit which prevents leakage. In my said patent no provision was made for locking the guard onto the syringe, and therefore, under certain conditions as when extremely high pressure is applied to the contents of the barrel, there is danger of the barrel being moved relative to the guard and needle.

The present invention contemplates a coupler or adapter whereby various styles of needles may be fitted and securely locked to the nipple or barrel of different types of syringes and afford a tight tapered fit which will be leak-proof and in which there is no likelihood of the barrel and needle becoming separated or loosened in operation.

Several different forms which my invention may assume are exemplified in the following description and illustrated in the accompanying drawings in which:

Fig. 1 shows a side elevation of my adapter formed integrally with a guard and employing a lock in the form of a bayonet joint, the said adapted being applied to a Luer syringe.

Fig. 2 shows a longitudinal central sectional view of the device of Fig. 1.

Fig. 3 shows a longitudinal central sectional view of a modified form of the adapter, whereby a Luer needle may be fitted to any type of syringe.

Fig. 4 shows a side elevation partly in section of the adapter applied to a special form of syringe.

Fig. 5 shows a sectional view of a modified

form of the adapter for screw thread connection with a syringe nipple and in which a needle has a conical base to enter a conical seat in the nipple.

Fig. 6 shows a sectional view of the adapter screw threaded to a syringe nipple and retaining a special form of needle in place.

Fig. 7 shows a side elevation of the needle of Fig. 6.

Referring particularly to Figs. 1 and 2, I show a syringe having a glass barrel 10 and a tapered glass nipple 11. An open-sided guard 12 surrounds the barrel and carries at its upper end a pin 13 to enter a bayonet slot 14 formed in a ferrule 15. The ferrule engages a flange 16 on the open end of the barrel and is provided with a cross arm 17 forming a grip for the fingers. The ferrule and barrel are locked together by means of a cap 18 screw-threaded onto the ferrule. The lower end of the guard adjacent the nipple is cut away at one side as indicated at 19 and forms a seat 20 against which a bead 21 on a needle base 22 may rest. The base of the needle is somewhat flattened as indicated at 22^a.

In operation, the ferrule is first positioned on the barrel and secured in place by the cap 18. Thereafter the needle base is positioned in its seat 20 and then the guard is slipped over the barrel and locked by means of the bayonet joint. To bring about a locking action the guard has to be turned relative to the barrel, and this will cause the needle base to turn upon the nipple, thus wiping the joint and affording a tighter fit. The bayonet joint securely holds the guard in place with the base of the needle fitting tightly over the nipple, and consequently there is no danger of the needle flying off when high pressure is applied to the contents of the syringe.

As indicated in Fig. 3, an adapter 23 forming a seat for a needle base 24 similar to the arrangement shown in Figs. 1 and 2, may be screw-threaded to a syringe nipple 25, instead of being formed as part of a guard. This nipple 25 may be an integral part of a syringe barrel or threaded onto the barrel, as by means of the threaded socket 26. The screwing of the adapter into place will cause

the needle base to turn with relation to the nipple and thereby wipe the joint.

Referring to Fig. 4, the syringe there shown comprises a stationary plunger 27 over which slides a glass or metal barrel 28. The plunger is formed integral with a guard 29, which guard surrounds the barrel and carries at its upper end finger grips 30. The plunger and guard terminate in a tapered nipple 31 which is screw-threaded so as to receive an adapter 32. The plunger and nipple have a central longitudinal bore for the fluid to pass through, and at the end of the nipple is a conical seat to receive a cone-shaped end 33 of a needle base 34. The needle base is provided with a reduced portion 35 which seats in the end of the adapter through an open side 36. When the adapter is screwed upon the nipple, the cone-shaped end of the needle base is tightly seated in the cone-shaped end of the nipple. The adapter being cut away at one side is consequently somewhat flattened, and thus a secure grip can be obtained so as to turn the adapter and needle while the guard and nipple are held by means of the finger grips 30.

Fig. 5 shows a needle and adapter similar to Fig. 4, except that the adapter is screw-threaded directly onto a nipple 37 of a syringe barrel. The nipples shown in Figs. 4 and 5 have an exterior taper as well as an interior taper, and hence either type of needle base shown in Figs. 1 and 4 may be applied thereto.

Figs. 6 and 7 show an adapter 38 similar to that of Fig. 5, screw-threaded onto a nipple 39. The adapter is open at one side so as to receive the base 40 of a needle, the base being preferably made of flat sides and having a tapered socket to fit over the tapered nipple. The base has a reduced portion 40^a which seats in the end of the adapter.

The mode of assembling the needle in the adapter and attaching the adapter to a nipple or barrel will be obvious from the foregoing. In all forms of the invention I have provided an adapter which is readily applied and securely locked to a syringe barrel or nipple and having an open side through which any of the various forms of needle bases may be inserted quickly and easily and firmly seated therein, so that when the adapter is finally locked in place, either by the screw threads or bayonet joint, the needle base is turned upon the nipple and a leak-proof fit is provided. Furthermore, with the present invention, syringes which were not originally provided with a tapered fit can be readily converted so as to be leak-proof as the so-called Luer-type of syringe.

Various changes in the construction and arrangement of the several parts herein shown and described may be employed without departing from the spirit of my invention as disclosed in the appended claims.

In all forms herein shown the needle will be caused to turn with the adapter so as to give a wiping action to facilitate a close fit. This turning of the needle with the adapter is brought about by reason of the provision of flattened sides on the needle base, or as shown in Figs. 4 and 8 by virtue of the greater contact surface between the adapter and needle base as compared with that existing between the needle base and the nipple. Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

The combination with a syringe having a barrel formed with a tapered nipple and a needle having a tapered base to fit the nipple, an adapter having a socket to fit over the nipple and open at its side adjacent its outer end to receive the base of the needle laterally therein, said socket being formed with a seat against which the base rests, a guard formed integrally with the adapter and surrounding the barrel of the syringe, a ferrule secured to the barrel of the syringe, and means for locking the guard to the ferrule whereby the adapter will cause the needle base to be pressed firmly against the tapered nipple.

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