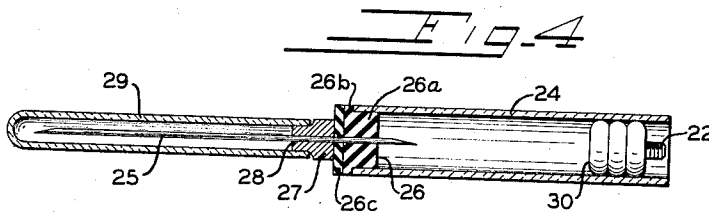
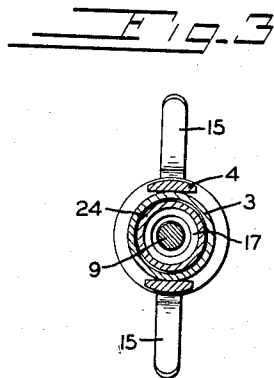
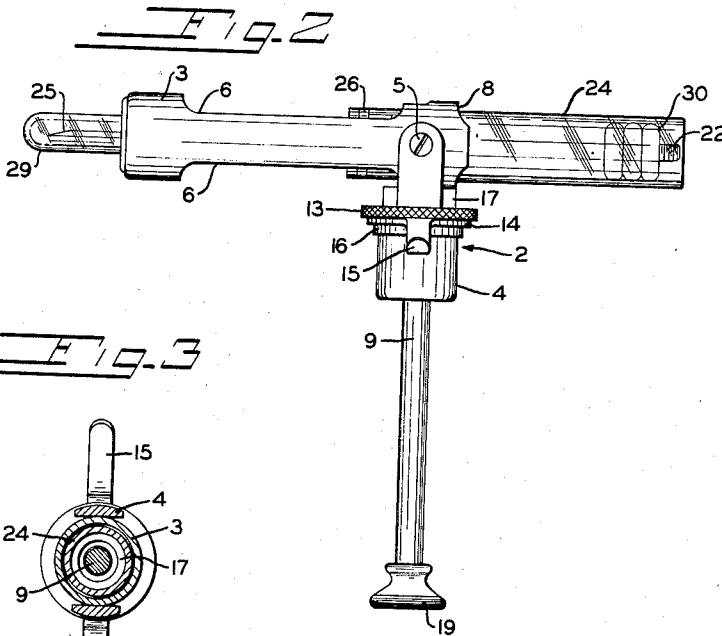
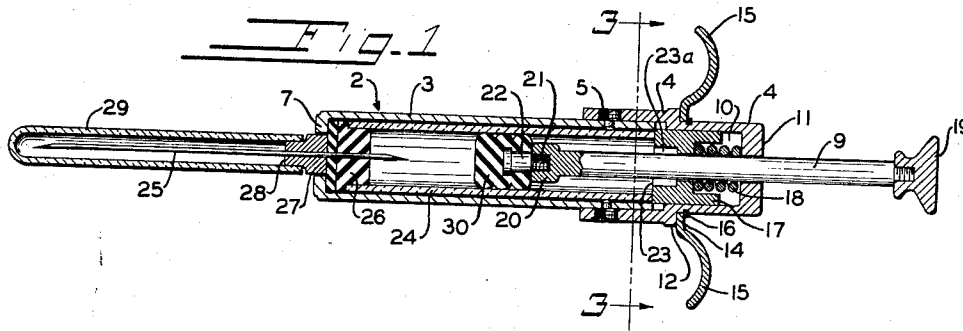


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BREECH LOADING SYRINGE FOR USE WITH
HYPODERMIC MEDICATION CARTRIDGES
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BREECH LOADING SYRINGE FOR USE WITH
HYPODERMIC MEDICATION CARTRIDGES

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4 Claims. (Cl. 128—218)

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This invention relates to a hypodermic unit, comprising a syringe and a medication cartridge therefore, and the parts comprising the unit which are separate articles of manufacture and sale but are readily assembled together for use. A hypodermic needle is assembled with the medication cartridge and hermetically sealed to be placed in sealed condition in the syringe with and as part of the medication cartridge. The needle is hermetically sealed by a protective sheath of any suitable material which facilitates insertion of the cartridge in the syringe and is not removed until after assembly or insertion of the cartridge in the syringe.

The invention not only comprises a unit which is simple in construction and assembly and efficient in operation, but the medication cartridge unit is prepared ready for use by simply inserting same in the barrel of the syringe and then removing the needle protective sheath. The needle is included with the medication cartridge and is hermetically sealed with the sheath which facilitates insertion of the cartridge in the syringe and is not removed until the syringe is "loaded." Thus, both the syringe and cartridge may be handled without contaminating the needle. The cartridge, including the needle, is disposed of after application or use of the medication, thereby also avoiding contamination resulting from improper sterilization where the same needle is used repeatedly for applying more than one medication. The time and trouble for sterilization of the needle for each application is avoided. Each cartridge is complete with medication and needle and with the needle fully protected for being handled without contamination.

The syringe comprises a barrel hinged to a holder for a plunger handle so that a cartridge may be readily inserted in and removed from the sheath or barrel when the syringe is breeched by means of the hinged connection between the barrel and the plunger handle holder. Abutment means is provided on the barrel to engage a portion of the cartridge as the cartridge is spring pressed in the barrel by means on the head of the syringe. Finger holders are disposed oppositely on the plunger handle holder so that the syringe may be readily grasped for manipulation of the plunger handle to move the piston in the cartridge as hereinafter described.

The cartridge has a transparent hollow tube with a needle mounted in one end and a piston mounted in the opposite end adjacent to the end of the plunger of the syringe. A medication is

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contained in the hollow tube of the cartridge between the needle mounting and the cartridge piston so that upon operation of the plunger handle of the syringe the cartridge piston will be moved to eject the medication through the needle. The needle is mounted with one end in communication with the medication chamber of the hollow tube between the needle mounting and piston, and the other end projecting beyond the end of the hollow tube. A resilient seat is provided between the end of the hollow tube of the cartridge and the engaging abutment on the barrel of the syringe so that the cartridge may be held tightly in place with the fragile parts out of contact. The exposed end of the needle is covered with a shield or protector having an open end, opposite a closed end, to fit on a projection which will hermetically seal the shield or protector for the needle.

The cartridge piston and the plunger handle in the syringe are adapted to be positively engaged so that the cartridge piston may be retracted as well as pushed forward in the tube of the cartridge. Selective manipulation of the piston forward or backward by the user is important in determining whether the needle has or has not penetrated a vein of the patient, for the user must positively know that a vein has been penetrated if an intravenous injection is to be given or that a vein has not been penetrated if it is an intramuscular injection.

For a better understanding of the invention, reference is made to the accompanying drawings, in which:

Fig. 1 is a longitudinal cross-sectional view of an embodiment of the invention;

Fig. 2 is a view showing the syringe being breeched for insertion of the cartridge;

Fig. 3 is a cross-section on lines 3—3 of Fig. 1; and

Fig. 4 is a longitudinal cross-sectional view of the medication cartridge unit.

Referring specifically to the drawings in which like numerals are used to designate like parts, numeral 2 designates generally the syringe which is composed of a tubular barrel 3 and the handle holder 4 pivoted at 5.

The barrel 3 may be of any material, preferably of non-corrosive metal, with openings 6 in opposite sides. One end of the barrel is provided with an inwardly extending flange or lug 7, preferably annular and also preferably integrally formed. The opposite end of the barrel is open and unobstructed, and preferably has portions of the side edges cut away at 8 to be out of con-

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tact with the end of plunger handle 9 or a spring pressed member in the handle holder hereinafter described.

The handle holder is hollow to provide a chamber 10 between one end having an inwardly extending flange 11 and the opposite end having an outwardly extending flange 12, the outer peripheral edge being knurled at 13. A ring 14, having oppositely disposed arms 15, is loosely mounted upon the outer wall of the handle holder adjacent the flange 12 and confined by a flange 16. The spaced-apart flanges form a groove therebetween within which the ring is loosely held so that it can be turned relatively to the handle holder.

A cylindrical bushing 17 is fitted to slide within the chamber and has a diameter slightly less than the diameter of the bore of the cartridge tube so that the end of the bushing will fit within the end of the bore in the hollow tube of the cartridge. The bushing is spring pressed by a spring 18 which normally holds the end of the bushing in the end of the barrel 3 to axially align same with the handle 9 which manipulates the hereinafter described piston of the cartridge. The end of the bushing also abuts against the cartridge and holds same tightly within the syringe.

The handle has a detachable knob 19 on one end and a collar 20 on its opposite end. The collar 20 has a screw-threaded socket 21 to be screw-threadedly engaged with a stub shaft 22 which is anchored to the hereinafter described piston of the cartridge. The handle is freely reciprocable in the holder, and the collar 20 thereof is adapted to engage a shoulder 23 on the bushing whereby the end of the bushing may be withdrawn from the barrel of the syringe, against the compression of the spring, when the handle is retracted to its extreme position. A recess 23a may be formed advantageously in the end of the bushing to receive the collar 20 when same is retracted. Thus, the end of the handle will clear the end of the barrel of the syringe when the syringe is breached.

The cartridge comprises a tube 24, of any transparent material, such as glass or plastic, having a hypodermic needle 25 mounted in one end. This may be done conveniently by a resilient stopper 26, such as rubber, preferably having a portion 26a fitting into the end of the tube and provided with a head portion 26b. The head portion, if there be any head portion on the stopper, abuts against the end of the tube 24. The stopper could be formed without any head portion, but the head is preferable to protect the end of the tube and provide a cushion between it and flange 7. A hub projection 27 is mounted on the needle and provided with a reduced portion 28 to project and tightly fit into the open end of a protective sheath 29 for hermetically sealing the needle. This protective sheath may be of any suitable material, such as glass, plastics, or the like, and preferably transparent. The opposite end of the protective sheath is closed. The hub projection 27 may be of metal, rubber, plastic or any suitable material which will make a tight fit with the sheath. There is also a head 26c which may be a part of or separate from the hub. This head is of sufficiently large diameter to seat upon the lug or flange 7 of the syringe barrel and is secured fast to the needle so that the needle cannot be pulled out of its mounting 26. The head may be of any material but is preferably of rubber, and more especially if the stopper 25 is not provided with an

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enlarged head 26b, to serve as a gasket together with or without the enlarged head of the stopper 25 between the lug and flange 7 and the end of the tube 24 of the cartridge. These resilient parts, or either of them, allow for any tolerance so that the cartridge can be tightly fitting.

A piston 30 is fitted into the opposite end of the tube 24 and has the stub shaft 22, screw-threaded on the exposed end, projecting from one end. A medication is placed in the tube of the cartridge between the piston and the stopper or needle mounting.

The cartridge comes all prepared with the medication ready for use and needs only to be inserted in the syringe and the guard sheath removed just before use. The handle of the syringe is then forced forward and turned to engage the piston. The medication may be one to be used intramuscularly or intravenously, and the handle is constructed to be turned to screw-threadedly engage it with the stub shaft on the piston, thereby permitting the piston to be retracted as well as pushed in. A slight retraction of the piston, after insertion of the needle, will disclose whether a blood vessel has been penetrated, for, if it has, blood will show in the medication through the transparent sheath. Thus, an intramuscular or intravenous injection can be positively made.

The unit permits complete sterile technique for hypodermic injections of any material and eliminates the time and trouble for preparing and keeping the syringe sterile. Only one syringe needs to be carried by a doctor, which syringe can be used repeatedly regardless of the medication involved. Different cartridges have different types of medication, any of which could be selected for use with the single syringe. A used cartridge is disposed of after use, and a new one is inserted. Thus, there is no possibility for contamination. The cartridges may be labeled for identification as to the medication, and the proper ones may be selected for loading into the syringe for application.

The needle is not only combined with the medication cartridge but a sheath therefor is employed to protect the needle and facilitate insertion of the cartridge within the syringe. The medication, needle and shield comprise the cartridge unit which is assembled with the needle hermetically sealed, the needle shield not being removed until the hypodermic injection is to be given.

The hypodermic medicating unit or cartridge is the subject of a divisional application.

While the invention has been described in detail, it will be understood that there may be changes in details of construction without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A hypodermic syringe comprising a barrel for holding a medication cartridge, an abutment on the barrel against which the cartridge is adapted to seat, a plunger holder hinged to one end of the barrel, a reciprocable plunger mounted on the holder, a slidable means carried by the holder to fit in the end of the barrel and to engage the cartridge for axially aligning said plunger and barrel and holding the cartridge in position, and means on the plunger for retracting the slidable means out of engagement with said barrel.

2. A hypodermic syringe comprising a barrel for holding a medication cartridge, an abutment on the barrel against which the cartridge is adapted to seat, a plunger holder hinged to one

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end of the barrel, a reciprocable plunger mounted on the holder, a slidable means carried by the holder to fit in the end of the barrel for axially aligning said plunger and barrel and to engage the cartridge, a spring means for normally holding the slidable means within the end of the barrel and against the cartridge, and means on the plunger for retracting the slidable means against the spring.

3. A hypodermic syringe comprising a barrel for holding a medication cartridge, an abutment on the barrel against which the cartridge is adapted to seat, a plunger holder hinged to one end of the barrel, a reciprocable plunger mounted on the holder, a slidable means carried by the holder to engage the barrel for axially aligning said plunger and barrel, a spring means for normally holding the slidable means within the end of the barrel and to engage the cartridge, means on the plunger for retracting the slidable means against the spring, and means on the plunger for positively engaging the handle with a means carried by the medication cartridge.

4. A hypodermic syringe comprising a barrel for holding a medication cartridge, said barrel having one or more openings in the wall of the

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barrel, an abutment on the barrel against which the cartridge is adapted to seat, a plunger holder pivoted to the barrel adjacent one end thereof, a slidable bushing in the holder having one end adapted to project in the bore of the barrel, spring means normally pressing against the end of the slidable means in the bore of the barrel, a plunger longitudinally movable in the holder in axial alignment with the barrel, and means on the plunger to retract the slidable means from the bore of the barrel.

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