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CARTRIDGE-CYLINDER UNIT FOR HYPODERMIC SYRINGES

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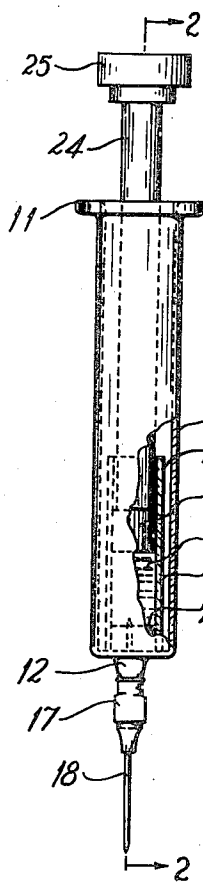


FIG. 1

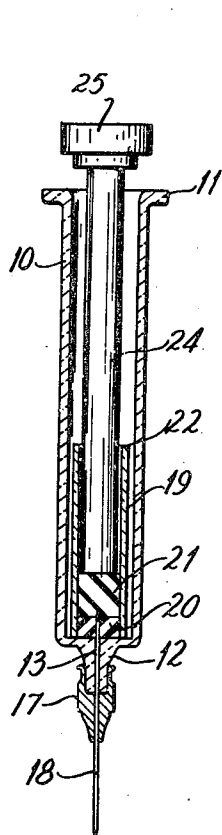


FIG. 2

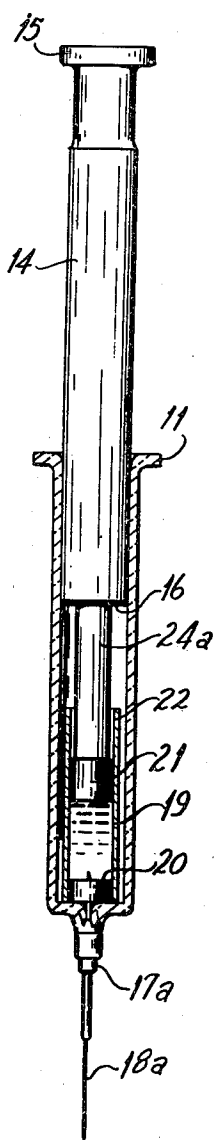


FIG. 3

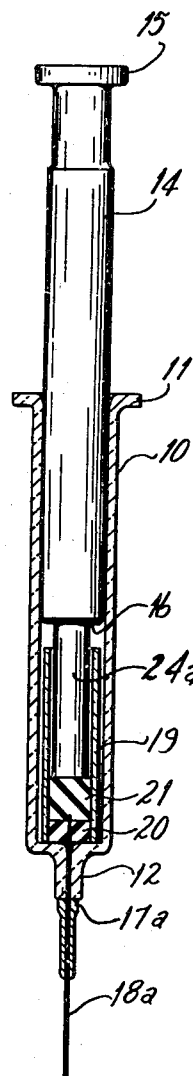


FIG. 4

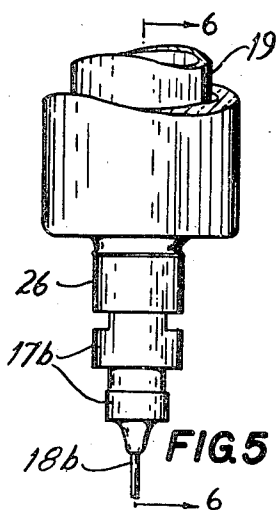


FIG. 5

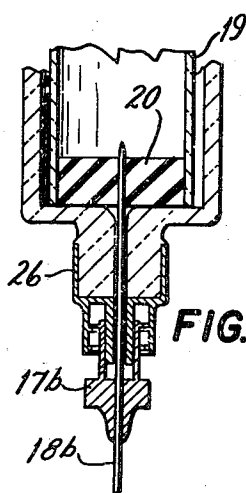


FIG. 6

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CARTRIDGE-CYLINDER UNIT FOR
HYPODERMIC SYRINGES

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4 Claims. (Cl. 128—218)

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The present invention relates to medical hypodermic syringes and more particularly to a novel and highly useful medicament cartridge and cylinder combination capable of use in standard or conventional medical hypodermic syringes.

Hypodermic syringes of various types and constructions are well known to and widely employed by physicians and other professional and technical people. Injectable medicinal preparations, which are marketed in ampules, are transferred in known manner to such a hypodermic syringe and then injected into the patient. Some injectable preparations are, however, not marketed in ampule form but rather in the form of cylinders of glass having a stopper at each end (hereinafter referred to as cartridges) with the injectable preparation therebetween. A special hypodermic syringe is required for the utilization of such cartridges and such increase the cost of the injections and are not always entirely satisfactory especially when oily or viscous preparations are involved. This is particularly true in the case of the penicillin-beeswax preparations recently developed. The difficulties and disadvantages involved in injecting these preparations are well known to physicians and others and include the designing of special syringes or parts which can be discarded, the impracticability of cleaning and sterilizing such parts for re-use and the added cost thereof which ultimately is paid by the patient. These difficulties and disadvantages have not been satisfactorily overcome in a simple economical manner so far as I am aware.

One of the objects of the present invention is to make it possible to inject penicillin-beeswax injectable preparations by means of an ordinary conventional form of hypodermic syringe found in every doctor's office, hospital, etc.

Another object of the invention is to produce and market a cartridge-cylinder combination of novel character in which the cartridge itself differs from the conventional cartridges described above.

A further object of the invention resides in the provision of a cartridge for injectable medicaments in which the cartridge wall has a cylindrical sleeve extension adapted to receive one end of a cartridge cylinder provided for cooperation therewith and by means of which the injectable preparation is expelled from the syringe at the desired time.

An additional object of the invention is to simplify the procedure for injecting medicinal preparations by eliminating the use of a special or expensive form of hypodermic syringe and gen-

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erally to improve upon the technic of injecting medicinal preparations which require the use of a considerable amount of pressure such as penicillin-beeswax injectable preparations.

A still further object of the invention resides in the provision that with the use of this cartridge-cylinder combination and ordinary conventional type of medical hypodermic syringe, the physician or operator can carry out aspiration to determine whether or not a blood vessel has been punctured whereas with some of the special syringes aspiration cannot be done while with others the procedure can be carried out but not with full assurance whether or not blood vessel puncture has been made. Penicillin-beeswax injectable preparations are injected into muscle and great care must be exercised so that intravenous injection is avoided.

Other and further objects and advantages will be understood and appreciated by those skilled in this field or will be apparent or pointed out hereinafter.

In the accompanying drawing:

Fig. 1 is a vertical elevational view showing the present invention ready for use, certain parts being broken away to expose the underlying structure.

Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1 but showing the parts in the positions which they assume after actuation.

Fig. 3 is a view generally similar to Fig. 1, but with parts in section, of a modified form of the invention.

Fig. 4 shows the parts of Fig. 3 after actuation. Fig. 5 is a fragmentary view showing a further form of syringe adapted for use with the present invention and

Fig. 6 is a section taken along line 6—6 of Fig. 5.

Referring now in detail to Figs. 1 and 2, the numeral 10 designates the hollow barrel of a standard or conventional hypodermic syringe found in every doctor's office, hospital, etc. Such a syringe is not to be confused with a dental syringe which is a special form of syringe. This syringe barrel is usually graduated so that a predetermined amount of a liquid medicinal preparation can be injected into a patient but the syringe may vary in its volumetric capacity, in the materials from which it is fabricated and minor details of structure. The syringe barrel which is illustrated in the drawing is composed of glass of suitable composition and is cylindrical in nature terminating at one end in a lateral flange 11 and at the other end in a reduced tip 12 which has a capillary bore 13 therethrough as will be clear

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from Fig. 2. A syringe of this type has a syringe cylinder 14 (Fig. 3), which is hollow or solid, having one end formed with a lateral flange 15 and the other end closed by a transverse wall 16 (in the case of a hollow cylinder). The tip 12 of the syringe barrel 10 is, during use, provided with a hub 17 which is applied thereto in any suitable or known manner either frictionally or interlocking and such hub is usually composed of some suitable metal or alloy such as stainless steel, aluminum or other metallic composition. The hub 17 is provided, as shown, with a needle 18 which may be of any suitable or known size, type and length. The needle illustrated is a double needle but it is understood that various known types of double needle may be employed with various types of syringe tips without departing from the spirit or scope of this invention.

From an inspection of the drawing, it will be further appreciated that cartridge 19 is a glass cylinder having a stopper 20 in one end thereof which is preferably but not necessarily flush with the terminus of the cartridge and a second stopper 21 within the cartridge and located somewhat inwardly from the opposite end of the cartridge so as to form a cartridge sleeve extension 22. The injectable medicinal preparation 23 is located between stoppers 20 and 21 and is placed therein in suitable or known fashion familiar to those versed in this field. A cartridge cylinder 24 is provided which has a diameter such that one end thereof can be received within the cartridge sleeve extension 22 above described and cylinder 24 is sufficiently long to project appreciably from the syringe barrel 10 when assembled as shown in Fig. 1. The cartridge cylinder 24 is preferably provided with a suitable terminal enlargement such as the rubber cap member 25, this being for convenience of operation and actuation and not constituting an essential limitation upon the invention. The cartridge cylinder 24 may be hollow or solid and may be made of any suitable or desired material. While glass is highly suitable hard rubber, metal or other material may equally well be employed within the purview of the invention.

In preparing the structural arrangement shown in Fig. 1, the conventional syringe cylinder 14 is removed after carrying out aspiration in the usual manner to determine whether or not a blood vessel has been entered leaving only the syringe barrel 10 with the hub and needle attached thereto, it being understood that a suitable hub and double needle have been applied to the syringe barrel tip 12 prior to aspiration. The cartridge 19 is then inserted into the syringe barrel 10 until it reaches the end thereof with the sleeve extension 22 projecting upwardly in the position illustrated in Fig. 1. The cartridge cylinder 24 with its attached cap 25 is then placed in the position shown in Fig. 1 but it is to be understood that I may, if I so desire, pre-assemble cartridge 19 and cartridge cylinder 24 and insert the same into syringe barrel 10 as a cartridge-cylinder combination or unit. In such case, I provide some means for holding one end of cylinder 24 within sleeve extension 22 and this can most conveniently be carried out by the use of a suitable wax or adhesive composition or by the use of a simple rubber sleeve or gasket over the end of the cylinder so as to maintain the cartridge and cylinder in their temporary assembly as an integral unit. The use of such a unit is deemed preferable by me but the parts may be used either assembled as just described

or as separate members without affecting the utility or operativeness of the invention as will be clearly understood. Stoppers 20 and 21, which confine the injectable preparation and delimit its volume to that required in a given injection, may be made of any suitable material known to those skilled in this art, such as rubber or a synthetic or artificial rubber-like material such as neoprene. It is understood that all parts may be in a sterile condition immediately prior to use.

The invention is then ready for use and axial pressure is now exerted against cylinder 24. This pressure first results in piercing stopper 20 and effects communication with the injectable preparation 23. Continuation of the axial pressure forces stopper 21 towards stopper 20 until ultimately the two stoppers abut as shown in Fig. 2 at which time the injectable preparation 23 has been expelled through the needle 18, whereupon the needle is withdrawn from the patient and the parts are disassembled. The cartridge 19 and the cartridge cylinder 24 are discarded, the cartridge-cylinder combination or unit having been produced with such in view. The cartridge is of no further value but the cartridge cylinder could, if desired, be re-used. However, the cost of the parts is so small that they are normally discarded and such practice is deemed preferable. Similarly, the hub 17 and needle 18 are usually discarded although they could be reclaimed. One of the major advantages of the present invention is, however, the avoidance of such cleaning and sterilizing. Attention is directed to the fact that, through the use of the present invention, it is never necessary to discard the syringe or any part thereof as is commonly done by physicians and operators when using the ordinary syringe or certain special syringes. In one type of syringe in common use the entire syringe and all its parts are discarded after a single use. At the same time and of great importance is the fact that by means of this invention aspiration may be carried out in the usual deft and sure manner so that this safety factor connected with making injections is in no way impaired nor sacrificed.

Figs. 3 and 4 disclosed a modified form of the invention in which the cartridge cylinder 24a is short and suitably held in assembled relationship with the sleeve extension 22 of cartridge 19 in the manner already described above with respect to Figs. 1 and 2. One end of cylinder 24a thus abuts and/or is in frictionally held contact with stopper 21. The syringe cylinder 14, previously mentioned, constitutes a normal and ordinary part of the syringe as a whole and is used as a supplementary cylinder to push against cartridge cylinder 24a to cause the parts to move from the positions shown in Fig. 3 to the positions shown in Fig. 4.

Cartridge cylinder 24a may be either hollow or solid, and, like cylinder 24, may be of glass, hard rubber, metal or any other suitable material. The somewhat different form of hub 17a and needle 18a is illustrated in these figures to show that the particular form of hub and needle does not constitute a limitation upon the invention.

The form of syringe, hub and needle illustrated in Figs. 5 and 6 further delineates how the invention is adapted to be used with known equipment and further demonstrates the versatility and utility of the cartridge-cylinder combination or unit. Figs. 5 and 6 show my invention in

conjunction with a B-D Luer-Lok hypodermic syringe having a metal cap 26 over the syringe tip formed with a spirally interlocking hub 17b carrying double needle 18b. This syringe construction is already the subject of patent protection and per se forms no part of my present invention.

In describing and illustrating the syringe and the needles above referred to it is understood that such is purely illustrative and is not intended as restrictive since other specific forms of syringes and needles can be equally well employed. It will be appreciated from the foregoing that the modification of Figs. 3 and 4 is operated in a generally similar manner to that of Figs. 1 and 2 but that the syringe cylinder 14 is additionally used together with the short cartridge cylinder 24a, since in some cases it has been found that a short cartridge cylinder is better and more convenient and forms a better cartridge-cylinder unit for manufacture and production purposes.

I claim:

1. A cartridge-cylinder unit for use in the barrel of a standard medical hypodermic syringe with which aspiration for blood or tissue fluid can be carried out under clear view before injection is made which comprises a cylindrical glass cartridge, a stopper in one end thereof substantially flush with the adjacent cartridge end, a stopper in the other end of such cartridge disposed somewhat inwardly to provide an annular sleeve extension, an injectable preparation confined between said stoppers and a cartridge cylinder disposed in axial alignment with said cartridge and having one end thereof held within and guided by said sleeve extension.

2. A cartridge-cylinder unit for use in the barrel of a standard medical hypodermic syringe of the Luer type with which aspiration for blood or tissue fluid can be carried out under clear view before injection is made which comprises a cylindrical glass cartridge, a stopper in one end thereof substantially flush with the adjacent cartridge end, a stopper in the other end of such cartridge disposed somewhat inwardly to provide an annular sleeve extension, an injectable preparation confined between said stoppers and a hollow cartridge cylinder disposed in axial alignment with said cartridge and having one end thereof held within and guided by said sleeve extension.

3. In combination, a standard medical hypo-

dermic syringe barrel open at one end and having its other end provided with a reduced, apertured tip, a needle hub engaging said tip and provided with a double needle one portion of which extends through said reduced tip into the interior of said barrel, a cylindrical glass cartridge axially disposed in said syringe barrel, a stopper in each end of the cartridge, that in the end of the cartridge adjacent the reduced tip being substantially flush with such cartridge end and being adapted to be pierced by the portion of the needle in the barrel and that in the other end of the cartridge being somewhat inwardly of the cartridge end to provide an annular sleeve extension, an injectable preparation confined between said stoppers and a cartridge cylinder in axial alignment with said cartridge and syringe barrel and having one end held within and guided by said sleeve extension.

4. In combination, a standard Luer type medical hypodermic syringe barrel open at one end and having its other end provided with a reduced, apertured tip, a needle hub for said tip and provided with a double needle one portion of which extends through said reduced tip into the interior of said barrel, a cylindrical glass cartridge axially disposed in said syringe barrel abutting the reduced end, a stopper in each end of the cartridge, that in the end of the cartridge adjacent the reduced tip being substantially flush with such cartridge end and being adapted to be pierced by the portion of the needle in the barrel and that in the other end of the cartridge being somewhat inwardly of the cartridge end to provide an annular sleeve extension, an injectable preparation confined between said stoppers and a hollow cartridge cylinder in axial alignment with said cartridge and syringe barrel and having one end adhesively held within and guided by said sleeve extension.

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