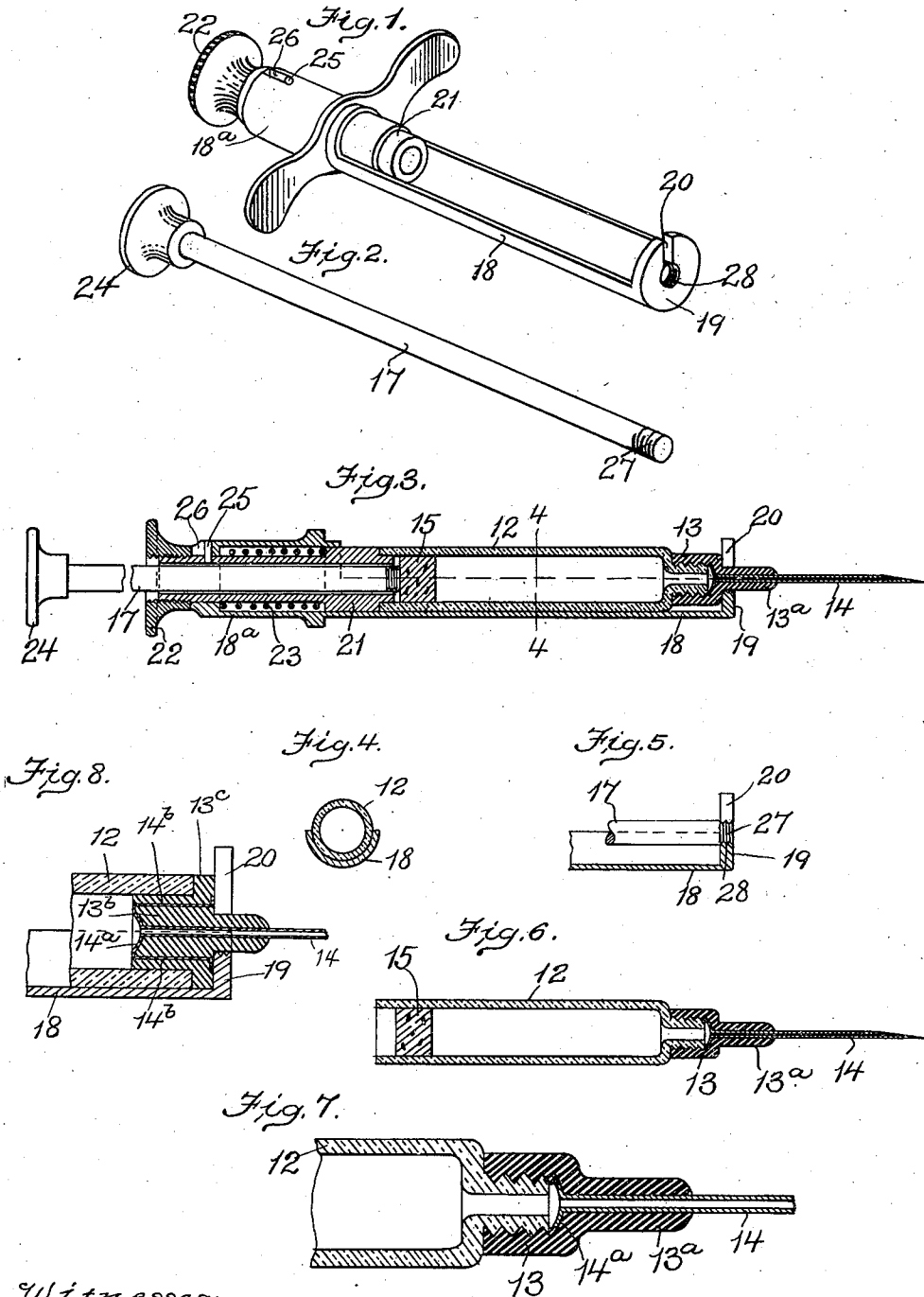


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 SYRINGE.

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SYRINGE.

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To all whom it may concern:

Be it known that I, JOSEPH PAYNE, of Melrose, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Syringes, of which the following is a specification.

This invention relates to a syringe the barrel of which has a tubular outlet through which a liquid may be forced.

The invention relates primarily to a hypodermic syringe, the tubular outlet being a hypodermic needle adapted to administer sub-cutaneous injections.

The invention has for its object to provide a syringe of this character of such construction that the barrel and its outlet may be discarded after being once used, the syringe comprising, in addition to the barrel and its outlet, a barrel holder adapted to detachably engage the barrel and having a guide for a piston rod adapted to bear separably on a piston contained in the barrel. The barrel, its tubular outlet, and the piston therein are of relatively cheap construction, so that after being used they may be discarded and replaced by another barrel similarly equipped.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings which form a part of this specification,—Figure 1 represents a perspective view of a piston barrel holder adapted to detachably engage a discardable barrel in accordance with my invention; Fig. 2 represents a perspective view of a piston rod adapted to be used with said holder; Fig. 3 represents a longitudinal section of a complete syringe including a discardable barrel, constructed in accordance with my invention; Fig. 4 represents a section on line 4—4 of Fig. 3; Fig. 5 represents a fragmentary sectional view showing the piston rod coupled to a barrel holder; Fig. 6 represents a longitudinal section of the barrel and its outlet and piston removed from the holder; Fig. 7 represents an enlargement of Fig. 6; and Fig. 8 represents a fragmentary sectional view showing a different form of head at the outer end of the barrel.

Similar reference characters indicate the same or similar parts in all the figures.

In the drawings, 12 represents a syringe barrel which is composed of a glass tube

open at both ends, and is provided at one end with means for connecting a tubular outlet 14 thereto, said outlet being preferably a cannula. The said outer end is preferably reduced and externally screw-threaded to engage an internally threaded soft rubber head 13 in which the cannula is inserted. The barrel is also provided with a stopper 15, closely fitting its interior and adapted to serve, when in the position shown, as a stopper to retain a charge of liquid in the barrel, and also to be moved toward the outlet and thus act as a piston to expel liquid through said outlet. The head 13 is preferably provided with a nipple 13^a also of soft rubber, surrounding a portion of the cannula and securely yet flexibly connecting it with the head, the cannula being provided with a cupped flange 14^a at its inner end adapted to contain a small body of sealing wax to prevent escape of liquid through the cannula until the wax is punctured by a wire inserted in the cannula.

The barrel and its accessories above described may be made at a relatively small cost, so that it is entirely practicable to discard it after it has been once used, the said barrel constituting, in effect, a cartridge of which an indefinite number may be supplied for each holder, hereinafter described, the cartridge being used successively.

My invention includes a holder for the barrel or cartridge above described, said holder being open at one side to permit the application and removal of the barrel by a lateral movement of the latter, and provided at its outer end with an abutment for the head 13 of the barrel, and at its inner end with a guide adapted to direct a piston rod 17 into the barrel, so that said rod when pressed inwardly, forces the piston toward the outlet of the barrel, the pressure of the rod 17 against the piston also pressing the head 13 against the abutment.

In the preferred embodiment of my invention here shown, the holder comprises a semi-tubular portion 18, forming a tray into which the barrel may be inserted and from which it may be removed by a lateral movement. The outer end of the tray, 18 is closed by an abutment 19, which as here shown, is a disk suitably secured to the half tube and provided with a recess 20 extending from one edge to and across its center, said recess being adapted to receive the nipple 13^a. The opposite end of the tray 18

is provided with a tubular enlargement 18^a constituting a casing in which the piston rod guide 21 is movable. Said guide is a tube having at one end a head or handle 22, and formed at its opposite end to be projected into the tray and bear on the inner end of the barrel 12, and preferably to slidingly enter the barrel, as shown by Fig. 3.

23 represents a spring contained in the casing 18^a, said spring bearing at one end on a shoulder within the casing, and at the other end on a shoulder on the guide 21, and being adapted to press the guide toward the barrel 12.

The piston rod 17 is movable freely endwise in the guide, and is provided at its outer end with a head or handle 24.

The rod is separable from the guide so that when a barrel is in place in the holder the rod may be stored beside the holder until its use is required.

When the guide 21 is retracted, a barrel 12 inserted in the holder may be readily removed and replaced by another barrel, which is secured by the forward pressure of the guide 21 against it.

To enable the guide 21 to be secured in a retracted position while the barrel is being removed and another inserted, I provide the guide with a pin 25 and the casing 18^a with a slot 26. When the guide is projected the pin enters the slot, as shown by Figs. 1 and 3. When it is desired to hold the guide in a retracted position, the guide is partially rotated to move the pin out of alignment with the slot and cause the pin to bear on the rear end of the casing.

When the holder is not in use, the piston rod 17 may be coupled to it by means of an external screw-thread 27, formed on one end of the rod, and an internal screw-thread 28 formed in the inner end of the recess 20, said inner end being of greater diameter than the outer end of the recess.

It will be seen that the described holder is adapted to be quickly and conveniently engaged with and separated from a barrel of the character described, and to be stored in a compact space with the rod 17, when not in use.

The nipple 13^a, when inserted in the recess 20, forms a yielding support or cushion for the cannula permitting it to yield or tip sidewise, the cannula having therefore a flexible connection with the syringe, which is an advantage.

It will be seen that the portion of the head 13 interposed between the reduced outer end of the barrel and the abutment 19, is compressed by the outward pressure exerted on the barrel by the piston rod guide 21, so that leakage of liquid between the outer end of the barrel and the head is prevented.

In Fig. 8 I show the barrel 12 of uniform diameter to its outer end, and provided with a compressible head 13^b formed as a plug or stopper preferably of soft rubber, having a flange 13^c which bears on the outer end of the barrel and on the inner side of the abutment 19. The pressure of the piston rod guide 21 on the barrel causes the compression of the flange 13^c between the barrel and the abutment thus preventing leakage of liquid at the outer end of the barrel. Fig. 8 also shows the flange 14^a of the cannula provided with flexible ears 14^b which are passed through the head 13^b and are clenched on the outer end thereof to prevent inward endwise pressure on the cannula from moving it inwardly in the head.

I claim:

1. A syringe comprising a barrel holder having at one end a tubular portion and at the opposite end a barrel abutment provided with an opening to receive a contracted barrel outlet, the portion of the holder between the tubular portion and the abutment being open at one side and forming an open tray adapted to receive a barrel, a tubular piston rod guide movable in said tubular portion and adapted to be projected into the tray to engage one end of a syringe barrel inserted in the tray and hold the opposite end of the barrel against the abutment, and a piston rod movable in said guide and adapted to be projected into a syringe barrel held by the tray, the rod being separable from the guide.

2. A syringe comprising a barrel holder having at one end a tubular portion and at the other end a barrel abutment provided with an opening to receive a contracted barrel outlet, the portion of the holder between the tubular portion and the abutment being open at one side and forming an open tray adapted to receive a barrel, a tubular piston rod guide movable in said tubular portion, and a spring which normally projects one end portion of said guide into the tray, said projected end and the abutment engaging the end portions of the barrel and confining it to the tray.

3. A syringe comprising a barrel holder having at one end a tubular portion and at the other end a barrel abutment provided with an opening to receive a contracted barrel outlet, the portion of the holder between the tubular portion and the abutment being open at one side and forming an open tray adapted to receive a barrel, a tubular piston rod guide movable in said tubular portion, and a spring which normally projects one end portion of said guide into the tray, the said end portion being formed to enter the mouth of the barrel, and having a shoulder formed to bear on the end of the barrel.

4. A syringe comprising a barrel holder

having at one end a tubular portion and at the opposite end a barrel abutment provided with an opening to receive a contracted barrel outlet, the portion of the holder between the tubular portion and the abutment being open at one side and forming an open tray adapted to receive a barrel and a tubular piston rod guide movable in said tubular portion, and adapted to be projected into the tray, a barrel adapted to be inserted laterally in said tray and formed at one end to bear on the abutment and at the opposite end to engage the projected end of the piston rod guide, said barrel having a stopper formed as a piston, and a tubular outlet formed to extend through the abutment, and a piston rod movable in said guide and separable therefrom and from the piston.

5. A syringe comprising a barrel holder open at one side to receive and permit the removal of a barrel, and provided at one end with a barrel abutment and at the opposite end with a piston rod guide, and a piston rod movable in the guide and adapted to bear separately on a piston in a barrel engaged by the holder, the said abutment having an outlet-receiving recess, internally screw-threaded at its inner end, and the rod having an external screw-thread adapted to engage the internal thread of the recess to detachably connect the rod with the holder.

6. A syringe barrel composed of a glass tube open at both ends and provided at its outer end with an elastic head having an elastic nipple, and a cannula inserted in said nipple and flexibly connected with the barrel, said cannula having a cupped flange projecting inwardly from its inner end and adapted to hold a seal in position to obstruct the passage through the cannula.

7. A syringe comprising a barrel holder open at one side to receive and permit the removal of a barrel and provided at one end with an abutment, and a barrel open at both ends and provided with an elastic head constituting a packing between the abutment and the interior of the barrel, a portion of said head being interposed between the outer end of the barrel and the abutment, and with a cannula having a liquid tight fit in said head, the holder being provided with means for pressing the barrel toward said abutment and thereby compressing the interposed portion of the head to maintain a liquid tight joint between the head and the barrel.

In testimony whereof I have affixed my signature, in presence of two witnesses.

JOSEPH PAYNE.

Witnesses:

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P. W. PEZZETTI.