March 4, 1941. D. I. PLETCHER 2,233,554

CANNULA HOLDER FOR HYPODERMIC SYRINGES

Filed April 4, 1938

FIG. 1

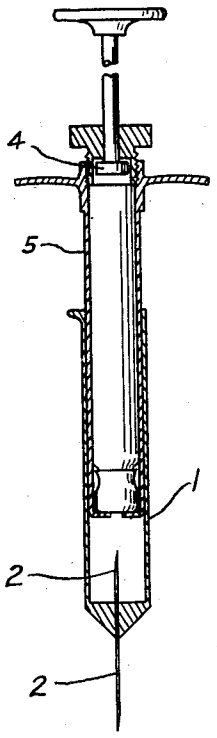


FIG. 2

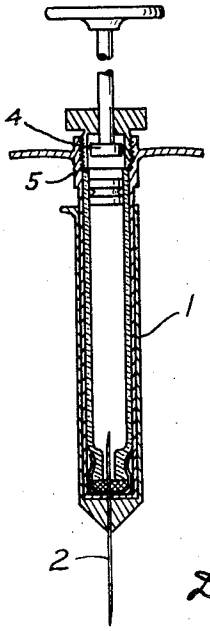
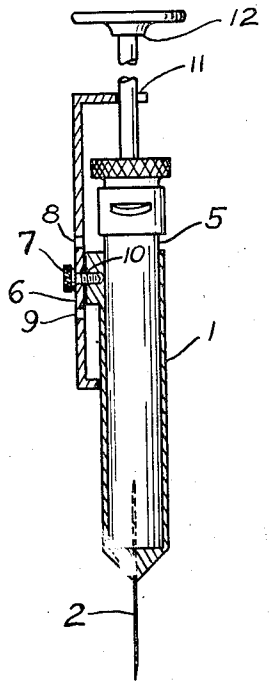


FIG. 3



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CANNULA HOLDER FOR HYPODERMIC SYRINGES

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Application April 4, 1938, Serial No. 199,917

1 Claim. (Cl. 128—215)

This invention relates to an improvement in hypodermic syringes of the cartridge-loading type, comprising an ordinary syringe of such said type, without the ordinary cannula which is screwed or otherwise rigidly attached to such ordinary types of syringes, in combination with a cannula carrying cylinder, which is slidable over the barrel or cylinder of the ordinary syringe, or in other words the two said cylinders being so arranged that the syringe cylinder can telescope into the cannula holding cylinder, with a cannula rigidly attached to the said cannula-holding cylinder in a manner similar to the way which cannulas are attached to ordinary cartridge syringes; by which is meant a cannula which protrudes from the exterior of the cannula holder for insertion into the flesh of a patient, with the other end penetrating into the cylinder for the purpose of penetrating the cartridge. In an ordinary syringe from which the ordinary cannula has been unscrewed and removed the interior or upper end of the cannula, which is inside the cannula-holding cylinder will pass through the regular hole in the ordinary syringe, and will penetrate about one-half inch into the syringe, when the said syringe is telescoped or slidden into the cannula-holding cylinder. When a cartridge is inserted into the syringe and pressed to the bottom, the upper end of the cannula attached to the cannula holder will penetrate the cartridge, ordinarily to a depth of about one-half inch, and then, the operator holding the combined instrument in his two hands, the cannula holder being held by one hand and the syringe with the other, with the button of the plunger in the palm of the hand and his fingers on the handles, forces the cannula into the flesh of the patient, and presses the plunger of the syringe in the ordinary manner so that the substance in the cartridge is ejected through the cannula into the flesh of the patient. Before the plunger of the cylinder has reached the end of the stroke a reverse action takes place, which is, with one hand the cannula is held firmly in the flesh of the patient, and the fingers of the other and are contracted to draw the cylinder of the syringe upward and at the same time the plunger is held in the same position and hence the contents of the cartridge continue to be ejected, while at the same time the upper portion of the cannula is withdrawn from the cartridge. In short an ordinary syringe is a single-barreled telescope in which the plunger telescopes into the barrel to expel the contents of the cartridge, and the applicant's invention for a parallel illustration consists of a compound or two barreled telescope in which the focus is obtained by movements in opposite directions. Or perhaps a clearer example is the compound microscope, in which a rough focus is obtained by telescoping the two main barrels and the finer adjustments are made by an opposite up or down movement of the eyepiece. The applicant also claims a regulating device, which will automatically arrest the downward movement of the plunger of the syringe, but which being attached to the cannula holding cylinder without any attachment to the barrel of the syringe, automatically regulated the length to which the plunger may be telescoped into, without interfering with the upward movement of the barrel of the syringe, and thereby allows the contents of the cartridge to be expelled, while at the same time the cannula is withdrawn from the cartridge and the syringe while still under pressure.

In using a hypodermic syringe to inject a medicant or serum into a living body there is always a counterpressure to that exerted by the piston of the syringe, which is caused by the blood pressure or the abscess pressure in the body of the patient, and it is desirable that neither the infected blood nor the pus shall be forced into the syringe for obvious reasons.

Of course a skillful operator will retain a cylinder pressure in the syringe until after the cannula has been withdrawn entirely, but if the cannula has been inserted into a pus pocket or infected area a certain amount of this infected matter may flow back through the cannula into the syringe; that is to be avoided if possible. With my invention the cannula may remain imbedded to the required depth while the syringe is withdrawn under pressure. Contents of barrel is resealed upon removal of holder; open needle ends permit rapid sterilization by flame or agents.

The invention comprises the novel device and combination hereinafter more specifically described.

Referring to the accompanying drawing in which similar numbers refer to similar parts:

Figure 1 is a view in elevation partly in section of the cannula holder and cannula in combination with an ordinary hypodermic syringe, showing the syringe withdrawn from contact with cannula.

Figure 2 is the same as Figure 1, showing the syringe ready for use.

Figure 3 is an elevation partly in section, showing an attachment to regulate a predetermined dosage.

Fig. 1 shows my invention in its simplest form

in which the cannula 2 is carried by the cylinder 14 into which the cylinder 10 of the syringe slides or telescopes, and the plunger or piston of the syringe 4 slides or telescopes into the interior of cylinder 10. In said Figure 1, a cartridge has been inserted and the plunger 4 has been drawn out of the cylinder 10. The handles on cylinder 10 are grasped by the operator and then holding cylinder 14 in one hand and the handles 13, 13 are held in the fingers of the other hand, the cylinders 14 and 10 are then telescoped to the position shown in Fig. 2, in which the cannula has entered the cartridge and the instrument is ready for use. Still holding the cylinder 14 firmly with one hand, with the palm of the other hand on the button 12 and the fingers of the same hand on the handles 13, 13 the said hand is gradually clenched and the plunger 4 is moved downwards into the interior of cylinder 10, expelling the contents of the cartridge through cannula 2, into the flesh of the patient. Before the downward movement of the plunger 4 has expelled all the contents through the cannula 2, a reverse action takes place, with one hand firmly holding the cannula in the flesh by means of pressure on the cylinder 14 and while continuing to clench the hand the entire hand, holding the handles 13, 13 and the button 12 is lifted upwards and as it does so the cylinder 10 is also pulled upwards against the plunger 4, whereby the continued ejection of fluid or contents of the cartridge lasts until the cannula 2 has been extracted from the cylinder 10, any excess material expelled after the withdrawal of the cannula from cylinder 10, being held in cylinder 14.

In Fig. 3 a device is shown to automatically determine the point or place at which the downward action of plunger 4 shall be changed to the upward action of cylinder 10, the regulator 21 is attached to the cylinder 14, and it has no connection to cylinder 10. When the button 12 is pressed down until it rests upon the cross-piece 11, any further downward pressure on the button 12 will be applied downward through the device 21 and cylinder 14, to which 21 is attached to the cannula, so that the use of one hand to hold the cannula in the flesh is eliminated, and while the palm of the hand presses downwards on button 12, the further compression or clenching of the hand with the fingers on handles 13, 13 draws cylinder 10 away from the cannula and at the same time pulls the cartridge upward and thereby continues to eject the contents of the cartridge until after the cannula has been withdrawn from the cylinder of the syringe.

Having thus explained my invention, I claim:

In a hypodermic syringe of the character described a hypodermic cartridge-syringe, comprising a barrel, or cylinder, a plunger, handles on the cylinder, a button on the end of the plunger, without the ordinary screwed or rigidly attached cartridge-cannula, in combination with a cylinder into which the cylinder of the syringe can slide, the said female cylinder carrying a cartridge-syringe cannula, a regulator that may be operated to disconnect the cannula from the cartridge at a predetermined point, without the pressure on the syringe being removed, all substantially as described.

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