Aug. 9, 1955 D. C. WILLIAMS 2,714,888

CARTRIDGE SYRINGE

Filed Oct. 3, 1952

Fig. 1.

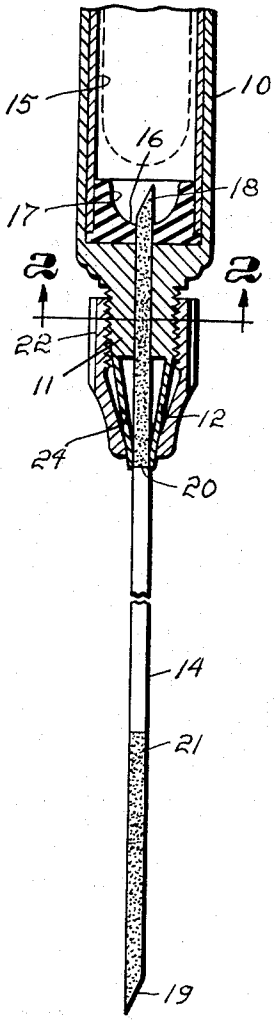


Fig. 4.

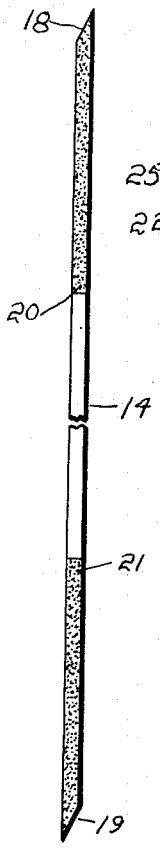


Fig. 3.

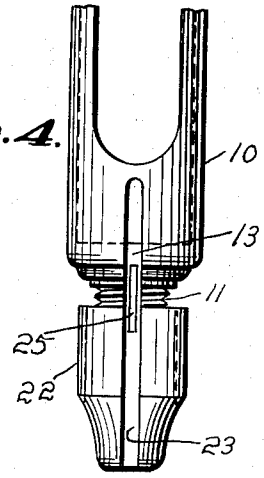


Fig. 5.

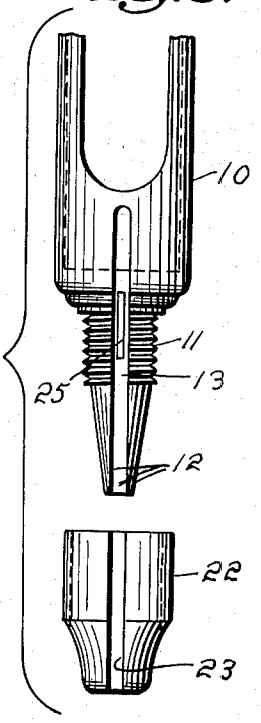


Fig. 6

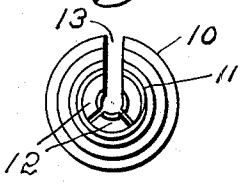
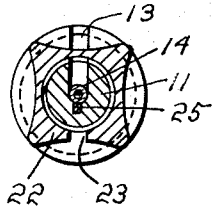


Fig. 2.



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CARTRIDGE SYRINGE

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Application October 3, 1952, Serial No. 312,887

8 Claims. (Cl. 128—215)

This invention relates to hypodermic syringes of the cartridge type to which double-ended needles of various lengths are to be detachably connected.

A cartridge syringe consists of a cartridge receiving body having a needle mounting tip at one end and means operable to lock the supported needle in place. Each needle for use with such a syringe must have its point, that is to pierce the cartridge seal, accurately located so that its entire point establishing bevel will so extend therethrough as to ensure the discharge of substantially all of the medicament from the cartridge.

Double-ended needles are, accordingly, provided with locating means enabling the position of their seal piercing points to be accurately established within the syringe body with reference to the syringe tip. One type of needle has a bead or hub which engages a seat with which the syringe tip is provided and against which it is clamped as by a locking sleeve threaded on the tip. Another type of needle has its locating means, as shown in co-pending application, Serial No. 300,454, filed July 25, 1952, now abandoned, in the form of surface indicia and is adapted to be locked to the syringe tip as by radially applied pressure.

The distance of such locating means from the cartridge seal piercing point of a needle is usually ⅝". The distance from such means to the other end of a needle determines its so-called "length." Needle lengths of 1", 1¼", or 1⅝" are widely used.

There is a demand for a cartridge syringe that will enable a sterile needle to be attached thereto without passing it through a bore in the syringe tip and the satisfaction of this demand is the major objective of this invention.

In accordance with the invention, a cartridge syringe is provided with an axially disposed slot, wider than the diameter of the needles to be used with it, that extends from the free end of the tip a substantial distance lengthwise of the syringe body. The tip part of this slot is of sufficient depth so that a needle deposited therein is positioned approximately axially of a cartridge located in the syringe body.

Means are employed to lock a needle to the syringe and these means are preferably in the form of a locking sleeve threaded on the syringe tip and having an axially disposed slot wider than the diameter of the needle and extending from end-to-end thereof. With such a sleeve, a needle may be deposited in the syringe slot without loss of sterility of either its tissue or its seal puncturing end when the locking sleeve slot is in registry therewith and confined therein by turning the sleeve. When the needle has its locating means in the form of surface indicia, the sleeve and tip preferably include chuck establishing portions.

Because the length of the exposed part of a needle deposited in proper position in the syringe slot is materially greater than its tip supported part, the needle must be held in place while the locking sleeve or other needle locking means are adjusted to securely attach

the needle to the syringe. In accordance with the invention, this holding is accomplished by means of a permanent magnet carried by the syringe to yieldably hold the deposited needle in proper position until the locking means can be actuated.

With the general objective in mind, reference is made to the accompanying drawings in which there is shown an illustrative embodiment of the invention from which its novel features and advantages and other objectives will be apparent.

In the drawings:

Fig. 1 is a longitudinal, fragmentary section of a hypodermic syringe in accordance with the invention with a needle attached thereto and the cartridge seal punctured.

Fig. 2 is a section taken along the indicated lines 2—2 of Fig. 1.

Fig. 3 is a fragmentary view, in elevation, of the syringe.

Fig. 4 is an elevational view of needle.

Fig. 5 is a view similar to Fig. 3 but with the sleeve detached from the syringe tip, and

Fig. 6 is a view of the syringe as viewed from its tip end.

In the embodiment of the invention shown in the drawings, the body **10** of a hypodermic syringe of the cartridge type is shown as having a threaded tip **11** which is provided with a plurality of chuck jaws **12**. A slot **13** of greater width than the diameter of the needle **14** extends, in an axial direction, from the free end of the tip **11**, where it establishes a relatively wide gap between a pair of chuck jaws, a substantial distance lengthwise of the syringe body **10**.

The depth of the slot **13** in the tip **10** is such as to enable a needle **14** to be deposited therein substantially axially of the cartridge **15** positioned in the syringe body **10**. As shown in Fig. 1, the cartridge **15** has a seal or diaphragm **16** formed with an annular portion **17** entrant of the cartridge **15**.

The needle **14** is beveled at each end to provide points **18** and **19** and is shown as of the type enabling either of its points to be used to puncture human tissue or the cartridge seal. Whichever end of the needle **14** is to be used to puncture the cartridge seal, it is essential that it be positioned with all of its bevel so extending through the seal that substantially all of the cartridge contents may be discharged therethrough. The needle **14** is provided with spaced surface indicia **20** and **21** to enable the point that is to pierce the cartridge seal **16** to be properly located with reference to the chuck jaws **12** and the length of the slot **13** is such as to enable the seal puncturing end of the needle **14** to be deposited in proper position in the slot **13** without contact with the body **10**.

Threaded on the syringe tip **11** is a sleeve **22** having an axially disposed slot **23** extending from end-to-end thereof. The width of the sleeve slot **23** is also greater than the diameter of the needle **14**. When the sleeve slot **23** is in registry with the syringe slot **13**, a needle **14** may be readily deposited therein so that a sterile needle may be thus positioned without fear of contaminating either its tissue or its seal piercing points. The sleeve **22** is then turned to advance it towards the syringe body so that it confines the deposited needle **14**. In practise, the inner surface of the sleeve **22** forwardly of its threaded portion is forwardly and inwardly tapered as at **24** to provide means for clamping the jaws **12** tightly against the needle **14**.

Because the exposed part of a needle **14** is usually greater than the part extending into the syringe, the deposited needle would topple from the slot **13** unless held in place until the locking sleeve **22** could be turned.

For that reason, the syringe is provided with a permanent magnet **25** which is preferably embedded in the bottom of the tip part of the slot **13** closely adjacent the syringe body **10**. The magnet **25** securely but yieldably holds the deposited needle **14** in place until the locking sleeve **22** can be turned to firmly secure the needle to the syringe.

It will thus be apparent that the invention makes possible a cartridge syringe well adapted to meet the requirements of ease of attachment to it of a sterile needle regardless of the means by which it is to be secured.

What I therefore claim and desire to secure by Letters Patent is:

1. A hypodermic syringe of the cartridge type for use with a double-ended needle, said syringe comprising a cartridge receiving body including a tip at one end, said tip and said body having an axially disposed slot which extends from the free end of the tip into that part of the body in which the cartridge piercing end of the needle is to lie and which is wider than the diameter of said needle, the tip part of said slot being of such depth as to position a needle approximately axially of a cartridge in said body, a permanent magnet mounted in said body to yieldably hold a needle seated in said slot, and adjustable means on said tip to anchor a needle thereto.

2. A hypodermic syringe of the cartridge type for use with a double-ended needle, said syringe comprising a cartridge receiving body including a tip at one end, said tip and said body having an axially disposed slot which extends from the free end of the tip into that part of the body in which the cartridge piercing end of the needle is to lie and which is wider than the diameter of said needle, the tip part of said slot being of such depth as to position a needle approximately axially of a cartridge in said body, a permanent magnet mounted in said body to yieldably hold a needle seated in said slot, and means movably mounted on said tip operable to close said tip slot and to lock said needle to said tip.

3. A hypodermic syringe of the cartridge type for use with a double-ended needle to be locked thereto by a threaded member, said syringe comprising a cartridge receiving body and a tip at one end thereof to which said member is to be threaded, said tip and said body having an axially disposed slot which extends from the free end of the tip a substantial distance lengthwise of the body and which is of a width greater than the diameter of said needle, the tip part of said slot being of such depth as to position a needle deposited therein approximately axially of a cartridge in said body, and a permanent magnet carried by said syringe to yieldably hold a needle deposited in said slot.

4. A hypodermic syringe of the cartridge type for use with a double-ended needle, said syringe comprising a cartridge receiving body including an exteriorly threaded tip at one end, said tip including needle anchoring portions, said tip and said body having an axially disposed slot which extends from the free end of the tip into that part of the body in which the cartridge piercing end of the needle is to lie, the tip part of said slot being of such depth as to position a needle approximately axially of a cartridge in said body, a permanent magnet mounted in said body to hold a needle seated in said slot, and a sleeve threaded on said tip and including portions that cooperate with said tip portions in anchoring a needle, said sleeve also having an axially disposed slot extending from end to end thereof, the width of said slots being appreciably greater than the diameter of said needle thereby to enable a needle to be deposited in the bottom of said slot when said slots are in registry to be confined therein by turning said locking sleeve.

5. A hypodermic syringe of the cartridge type for use with a double-ended needle, said syringe comprising a cartridge receiving body, an exteriorly threaded tip at one end of said body including needle anchoring portions, said tip and said body having an axially disposed slot which extends from the free end of the tip into that part of the body in which the cartridge piercing end of the needle is to lie, the tip part of said slot being of such depth as to position a needle approximately axially of a cartridge in said body, a permanent magnet embedded in the bottom of the tip part of said slot and a sleeve threaded on said tip and including portions that cooperate with said tip portions in anchoring a needle, said sleeve also having an axially disposed slot extending from end to end thereof, the width of said slots being appreciably greater than the diameter of said needle thereby to enable a needle to be deposited in the bottom of said slot when said slots are in registry to be confined therein by turning said locking sleeve.

6. In a hypodermic or like syringe for use with a needle, a body having a chamber and an opening in its distal end, said opening being in axial communication with said chamber a permanent magnet carried by said body laterally of said opening to yieldably hold said needle in a position concentric with said opening, and means to anchor said positioned needle to said body.

7. In a hypodermic or like syringe of the cartridge type for use with a double ended needle, a body having an opening in its distal end dimensioned to freely receive the cartridge piercing end of the needle, a permanent magnet carried by said body to yieldably hold said needle when entered through said opening, and means carried by said body to anchor said needle to said body.

8. In a hypodermic syringe of the cartridge type for use with a double ended needle, a cartridge receiving body including a tip at its distal end, said tip having an axially disposed slot extending to the free end thereof and which is axially in communication with the interior of the body, a permanent magnet mounted in said body to yieldably hold a needle seated in said slot with its cartridge piercing end entrant of said body and adjustable means on said tip to anchor a needle thereto.

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