Aug. 7, 1962 N. KRUEGER 3,048,172

HYPODERMIC SYRINGE

Filed May 20, 1960

FIG. 1

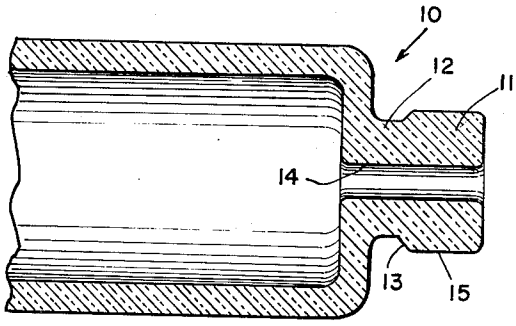


FIG. 2

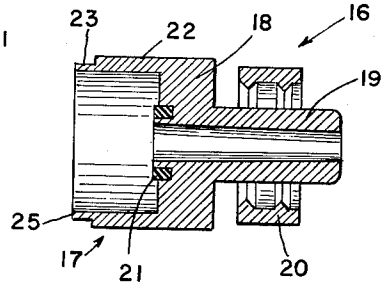


FIG. 3

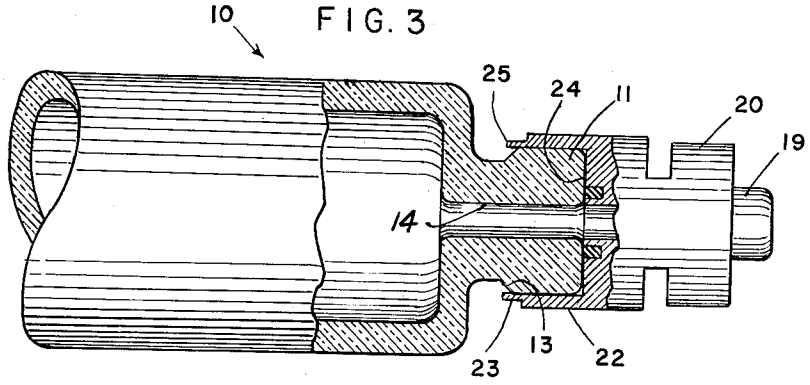
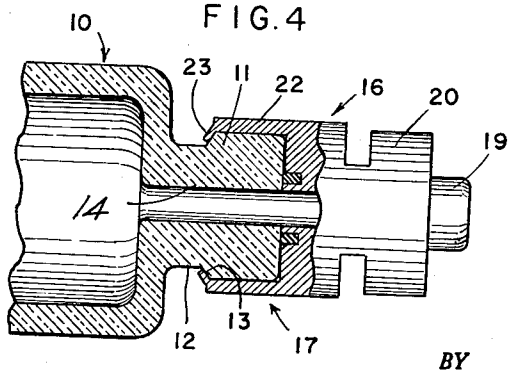


FIG. 4



INVENTOR.
NICHOLAS KRUEGER

BY Philip E. Hilbert

ATTORNEY

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HYPODERMIC SYRINGE

Nicholas Krueger, Woodridge, N.J., assignor to East Rutherford Syringes, Inc., Rutherford, N.J., a corporation of New Jersey

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This invention relates to hypodermic syringes, and more particularly, concerns the needle mounting or lock thereon.

Hypodermic syringes conventionally comprise a glass barrel which terminates at its forward end in a headed bored tip. Needle mounting means, in the form of a metal sleeve is force fitted on the barrel tip; the mounting means being provided at its forward end with the usual threaded portion for locking engagement with the hub of a needle which is to be associated with the syringe barrel.

While the force fit of the metal sleeve on the barrel tip appears to provide a firm connection between tip and sleeve; in many instances the connection is somewhat insecure and separation of the sleeve from the tip is not unusual, thereby materially shortening the normal life of the syringe.

Furthermore, with substantially increased sterilizing temperatures; autoclave sterilization being performed now with dry steam at about 350° F., there is noted an increased tendency for separation of the sleeve from the barrel tip.

Accordingly, an object of this invention is to provide an improved needle mounting construction for syringe barrels which is free of separation of the parts despite extreme conditions of usage.

Another object of this invention is to provide an improved needle mounting construction which is economical to manufacture and is assembled with the syringe barrel in an expeditious manner.

A further object of this invention is to provide a needle mounting of the character described, wherein the wall structure embracing the syringe barrel tip is of a character which allows for a gripping action which prevents separation of the parts despite the application of tension or torsional forces, or the development of stresses due to exposure of the syringe to elevated temperatures.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

In the drawing, FIG. 1 is a partial view in longitudinal section of the tip end of a syringe barrel; FIG. 2 is a longitudinal section of a needle mounting embodying the invention; FIG. 3 is a longitudinal sectional view showing the mounting of FIG. 2 assembled on the tip of the barrel shown in FIG. 1; and FIG. 4 is a side view, with parts in section, of a syringe barrel assembled with a needle mounting, showing a modification of the invention.

Referring in detail to the drawing, and particularly to FIG. 1, **10** designates the tip end portion of a hypodermic syringe barrel, usually formed of glass, and adapted to be associated with a plunger, not shown, in a manner known in the art. The barrel **10** has extending from the forward end thereof the usual headed tip **11** joined to the barrel by a short neck portion **12**, providing tip **11** with a rear shoulder **13**.

The tip **11**, which is bored axially as at **14** for communication with the interior of barrel **11**, may have a very slight taper towards the forward end thereof and may have its surface **15** ground to insure uniformity of the outer surface, all in a manner known in the art.

As shown in FIG. 2, there is provided a needle mounting or lock **16**, for secure attachment on barrel tip **11**. Mounting **16** comprises a metal sleeve portion **17**, a transverse partition **18** at the forward end of sleeve portion **17**,

an axially disposed tapered portion **19** extending forwardly of partition **18** and an internally threaded collar **20** concentrically related to tapered portion **19**. It is understood, that the hub of a needle, not shown, is fitted into collar **20** and twisted to a locking position, with portion **19** received in the hub bore. Partition **18** may be formed on its inner face with a circular recess for receiving a gasket **21** to provide leak-proof connection when needle mounting **16** is assembled with barrel tip **11**.

The metal sleeve portion **17** of needle mounting **16** includes a wall portion **22** of uniform thickness, which extends over the major portion of the longitudinal extent of the sleeve portion. Extending rearwardly of wall portion **22** is a second wall portion **23** of reduced thickness, said wall portion **23** forming a minor portion of the longitudinal extent of sleeve portion **17**.

The needle mounting **16** is assembled with barrel **10** in a conventional manner, by a force fitting operation wherein barrel tip **11** is telescopically received in sleeve portion **17**, with the end **24** of the tip **11** abutting the inner surface of partition **18** of the needle mounting **16**, gasket **21** being compressed therebetween to make a leak-proof connection. The tapered portion **19** of the mounting **16** is axially bored for connecting tip bore **14** with the bore of the needle, not shown.

The needle mounting **16** is formed of brass or other suitable alloy or metal, which can be readily machined. It has been found, that when sleeve **17** of the mounting includes the rear wall portion **23** of a thickness less than the thickness of the forward wall portion **22**, the grip of the sleeve on barrel tip **11** is substantially increased, particularly, when the rear edge **25** of wall portion **23** projects slightly beyond shoulder **13** on barrel tip **11**.

Thus, upon testing a needle mounting embodying the invention, as mounted on a syringe barrel, it was found that the mounting resisted the application of positive torsional forces and remained secured to the tip, whereas the same forces applied to a conventional needle mounting resulted in the mounting being twisted off the barrel tip. Similarly, when a plurality of each type of needle mounting associated with glass syringe barrels were autoclaved at about 350° F., most of the conventional mountings had separated from their barrels, while none of the novel mountings had separated from their associated barrels.

The thickness of sleeve wall portion **23** may be about ½ the thickness of wall portion **22**. Thus for a wall thickness of .025" for portion **22**; wall portion **23** may have a thickness of .013". However, the thickness of wall portion **23** may range from about .008 to about .015".

In another embodiment of the invention, shown in FIG. 4, the needle mounting **16** may be positively secured to barrel tip **11**, after telescopic assembly of the parts, by spinning the rear wall portion **23** of sleeve **17** over shoulder **13** of tip **11**. The reduced thickness of the wall portion **23** facilitates the spinning operation and avoids undue strain on the glass tip **11**, particularly at the juncture of neck **12** and tip **11**. Thus, the wall portion **22** of normal thickness is well adapted to withstand the stresses incident to attachment of the needle, not shown to needle mounting **16**, while the wall portion **23** of reduced thickness is adapted to allow for a spinning or crimping operation about the shoulder **13** of the glass tip **11** without breakage of the tip.

As various changes might be made in the embodiments of the invention herein shown without departing from the spirit thereof, it is understood that all matter herein disclosed shall be deemed to be illustrative and not limiting except as set forth in the appended claims.

Having thus disclosed my invention, I claim as new and desire to protect by Letters Patent:

1. In a syringe, a syringe barrel, an integral tip ex-

tending from one end of said barrel, said tip being bored to provide a passage communicating with the interior of said barrel, needle mounting means on said tip, said needle mounting means comprising a tubular metal sleeve telescopically mounted on said tip, said sleeve comprising a forwardly extending cylindrical wall portion of uniform thickness and a cylindrical skirt portion of a uniform thickness less than the thickness of said forwardly extending wall portion extending rearwardly from said forwardly extending wall portion.

2. In a syringe, a glass syringe barrel having a forwardly extending integral bored tip, a metal sleeve on said tip and projecting forwardly thereof, said sleeve having successive, longitudinally disposed wall portions of different uniform thickness, the wall portion of lesser uniform thickness throughout the longitudinal extent thereof being disposed about and tightly gripping the rear portion of said tip.

3. A spring as in claim 2 wherein the last mentioned wall portion has a thickness of about ½ the thickness of the wall portion disposed about the forward portion of said tip.

4. In a syringe, a glass syringe barrel having a forwardly extending integral bored tip, a needle mounting on said tip, said needle mounting comprising a metal sleeve having one longitudinally extending wall portion of a uniform thickness which is a fraction of the thickness of another longitudinally extending wall portion thereof, both of said wall portions being disposed about and tightly gripping said tip.

5. In a syringe, a glass syringe barrel having a forwardly extending bored, headed tip, a needle mounting on said tip, said needle mounting comprising a metal sleeve having a rearwardly extending wall portion of reduced uniform thickness, said wall portion being turned inwardly into engagement with rear edge portions of said headed tip.

6. In a hypodermic syringe, a glass barrel having a bored tip and a neck portion extending rearwardly from said tip with an annular shoulder at the juncture of said tip and neck portion, a needle mounting metal sleeve on said tip, said sleeve having a forwardly extending major longitudinal portion thereof of one uniform wall thickness and a rearwardly extending minor longitudinal portion thereof of a uniform wall thickness about ⅓ to about ½ of said wall thickness.

7. A syringe as in claim 6 wherein the rear edge of the last mentioned sleeve portion extends rearwardly beyond the shoulder at the juncture of said tip and neck portion.

8. A syringe as in claim 6 wherein the last mentioned sleeve portion is turned radially inward into contact with the shoulder at the juncture of said tip and neck portion.

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