Dec. 20, 1966 D. GABRIEL ETAL 3,292,624

HYPODERMIC SYRINGE AND NEEDLE COMBINATION WITH A SECONDARY, DETACHABLE NEEDLE ASSEMBLY

Filed Dec. 16, 1963

FIG. 1.

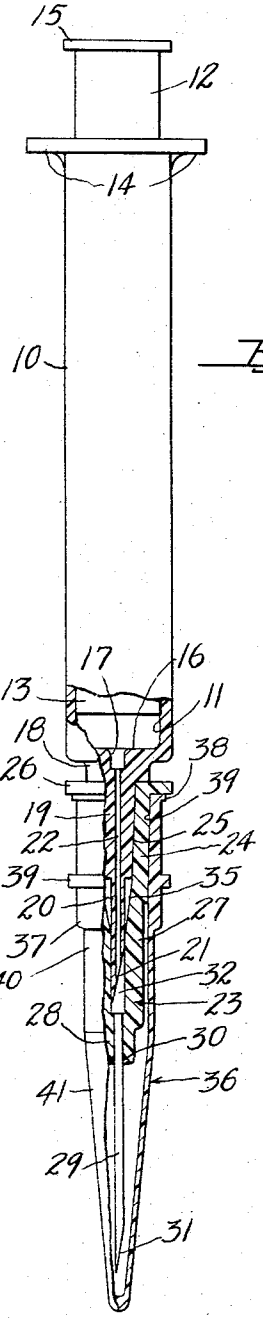


FIG. 2.

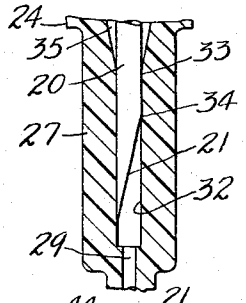


FIG. 3.

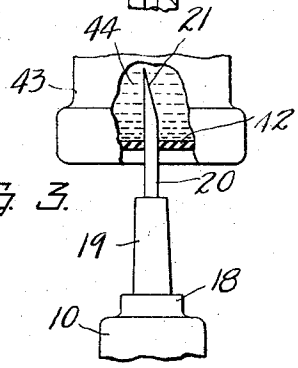
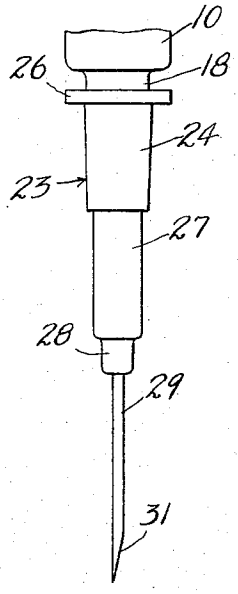


FIG. 4.



INVENTORS.
DANIEL GABRIEL
BY SUSAN M. GABRIEL
Howard E. Thompson
ATTORNEY

United States Patent Office 3,292,624
Patented Dec. 20, 1966

3,292,624

HYPODERMIC SYRINGE AND NEEDLE COMBINATION WITH A SECONDARY, DETACHABLE NEEDLE ASSEMBLY

Daniel Gabriel and Susan M. Gabriel, both of Bonny Blue, Va.

Filed Dec. 16, 1963, Ser. No. 330,750
2 Claims. (Cl. 128—221)

This invention relates to a hypodermic syringe assemblage employing means integral with the cylinder of the syringe for piercing a vial stopper in the operation of filling the syringe with a hypodermic needle unit detachable with respect to said means and, further, with a protective casing detachable with said unit to thereby provide a sterile assemblage which can be disposed of after use.

More particularly, the invention deals with an assemblage of the character defined, wherein all parts of the assemblage, with the exception of the needle of the unit employed, are preferably composed of plastic material to economize on the cost of producing the same.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawing, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

FIG. 1 is an enlarged side view of an assemblage made according to the invention, with parts of the construction broken away and in section.

FIG. 2 is an enlarged sectional detail of a part of the construction shown in FIG. 1, with the filling needle end of the cylinder shown in elevation.

FIG. 3 is a diagrammatic view illustrating the method of filling the cylinder of the syringe, preparatory to administering the medication; and

FIG. 4 is a side elevation of the lower end of the assemblage, with the needle unit exposed for use or administration.

Considering FIG. 1 of the drawing, **10** shows the cylinder of the syringe which, in a preferred form of the invention is made of molded plastic material and operating in the bore **11** of the cylinder is a plunger **12**, preferably having a suitable rubber end **13** to insure positive engagement with the wall of the bore **11** in drawing medication into the bore and in discharging medication therefrom. The upper end of the cylinder has laterally extending fingerpiece portions **14**, such as commonly employed in devices of the kind under consideration; whereas, the plunger **12** has an enlarged fingerpiece rim **15** at its upper end. The lower end of the cylinder **10** has a closure wall **16** with a discharge aperture **17** therein, the wall **16** including a projecting reduced diameter collar portion **18**, from which extends an externally tapered shank **19**.

At the terminal end of the shank **19** is a reduced diameter projecting needle **20** having a sharpened end **21** and extending through the needle and the shank is a small diameter bore **22**.

From the foregoing, it will be apparent that the collar **18**, shank **19** and needle **20** are all formed integrally with the casing **10**. At **23** I have shown a needle unit, clearly illustrated in side elevation in FIG. 4 of the drawing. The needle unit comprises an elongated tubular body of molded plastic material having an externally tapered portion **24** with a tapered bore **25** therein fitting the taper of the shank **19**, the upper end of **24** having a large diameter fingerpiece rim **26**.

Extending from **24** is a tubular portion **27** having a reduced end **28**, in connection with which a hypodermic

needle **29** is secured, this attachment being preferably through the medium of a suitable adhesive, as diagrammatically illustrated at **30** at the lower end of **28** in FIG. 1 of the drawing. The needle **29** is a metallic needle and has a pointed end, as seen at **31**. The needle **29** opens into a small diameter bore **32** in the lower portion of the tube **27** and the bore **32** is of such diameter as to snugly receive the needle **20**, at least in the area between the positions **33** and **34** in the bore **32**, as clearly noted in FIG. 2 of the drawing. Between the position **33** and the taper **25** in **24** is an abrupt taper **35**, part of which is shown in FIG. 2 of the drawing and also illustrated in FIG. 1.

When the various parts of the hypodermic syringe are in the assembled position, as noted in FIG. 1 and, in part, in FIG. 2, the pointed end **21** of the needle **20** extends into a position in close proximity to the upper end of the needle **29**, as will clearly appear from a consideration of FIG. 2 of the drawing, so that, in transferring the medication from the bore **11** of the cylinder **10** into and through the needle **25**, a minimum chamber would be provided in the lower end of the bore **32**. In this connection, it will be understood that, in applying the graduations on the cylinder to indicate amount of medication drawn into the cylinder **10**, these will be consistent with the several passages leading to the discharge end of the needle **29** to be assured that the proper quantity of medication will at all times be administered to the patient.

At **36** is shown a molded protective casing of plastic material, having an upper large diameter portion **37** terminating in a bead **38**, the portion **37** having adjacent its lower end an annular fingerpiece rim **39**, facilitating attachment and detachment of the casing **36**. The bore **39** of the end **37** is tapered to snugly engage the upper tapered end **24** of the unit **23**. The protective casing **36** has a reduced diameter tubular central portion **40** terminating in a downwardly contracted tubular end **41** of sufficient length to freely receive a cover for the needle **29**, the bore of **40** being sufficiently large to freely receive the tubular portion **27** of the unit **23**, as will clearly appear from a consideration of FIG. 1 of the drawing.

By employing the protective casing **36**, the assemblage can be brought to the physician in a completely sterile state and, in use, the physician first detaches the unit **23** with the protective casing **36** thereon and, then, injects the needle **20** through the rubber stopper **42** of a vial **43**, as diagrammatically illustrated in FIG. 3, so that medication **44** of the vial can be drawn into the bore **11** of the casing **10** to the extent required by the physician; whereupon, the removed casing **36**, with the unit **23** therein, is reassembled on the tapered shank **19** and, by holding the fingerpiece **26** with one hand and grasping the fingerpiece **39** of the protective casing **36**, this casing can be removed from the unit **23**, bringing the parts into the position shown in FIG. 4, at which time, medication can be administered to the patient by the physician.

Upon completing this operation, as and when the assemblage or device has completed its function, the same can be discarded. It will be understood, however, that, in some instances, the entire assemblage, with possibly the exception of the protective casing **36**, can be formed of other material and the syringe proper, including the unit **23**, can be reused by simply sterilizing the same and this, of course, could also apply to the protective casing, if desired.

It will be understood that the free end of the shank **19** forms a shoulder around the needle **20**, checking movement of the needle into a vial. In like manner, the collar **18** forms a stop, limiting movement of the unit **23** onto the tapered shank **19** and the rim **26** checks movement of the casing **36** on the tapered portion **24**. In FIG. 1 of

the drawing, the respective surfaces are shown in engagement; whereas, in actual practice, the taper will form a check so that the unit will not necessarily engage **18** and the protective casing will not necessarily engage the rim **26**.

The abrupt taper **35** operates to guide the needle **20** into the bore **32**. It will also be apparent that the unit **23** normally forms a protective enclosure for the needle **20**.

In connection with the operation of discharging medication from the syringe, in some instances, the physician may find it desirable to carefully actuate the plunger to bring the medication to the discharge end of the needle **29**, prior to injecting the needle into the patient and administration of the medication. This method of procedure is particularly advantageous when the physician wishes to avoid injection of air.

Having fully described my invention, what we claim as new and desire to secure by Letters Patent is:

1. In a hypodermic needle assemblage of the character defined, a syringe cylinder including a plunger operating in said cylinder, a discharge end of the cylinder having an integral projecting tapered shank, a reduced diameter needle integral with and projecting from said shank and terminating in a sharpened point, said shank and needle having a one-diameter bore extending therethrough, a supplemental needle unit detachably mounted on said tapered shank, said unit having a bore, said unit including a projecting hypodermic needle communicating with the bore in the unit, said bore of the unit snugly engaging a substantial longitudinal portion of the first named needle, a protective casing enveloping substantially the entire unit and detachable with said unit in forming a complete unitary assemblage of the cylinder, unit and said casing, and said casing having a downwardly contracted tubular end.

2. An assemblage as defined in claim **1**, wherein the unit and protective casing include projecting annular fingerpiece portions facilitating attachment and detachment of the unit with respect to the tapered shank of the syringe casing, as well as detachment of the protective casing with respect to said unit.

References Cited by the Examiner

UNITED STATES PATENTS

2,512,568	6/1950	Saffir	128—215
2,845,068	7/1958	Gabriel	128—221
2,868,201	1/1959	Gabriel	128—221
3,021,942	2/1962	Hamilton	128—218

FOREIGN PATENTS

796,539	6/1958	Great Britain.

RICHARD A. GAUDET, *Primary Examiner.*

DALTON L. TRULUCK, *Examiner.*