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G. COANDA ET AL

3,381,813

HYPODERMIC NEEDLE AND PROTECTOR THEREFOR

Filed Sept. 7, 1965

FIG. 1.

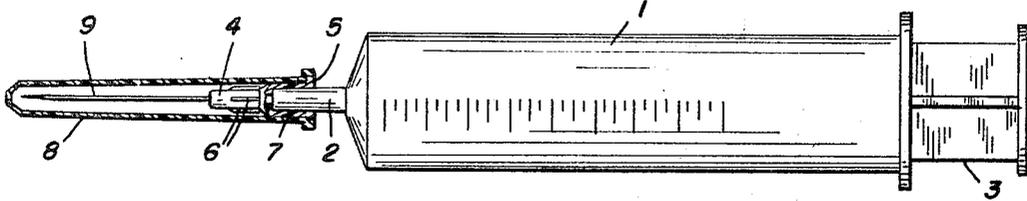


FIG. 2.

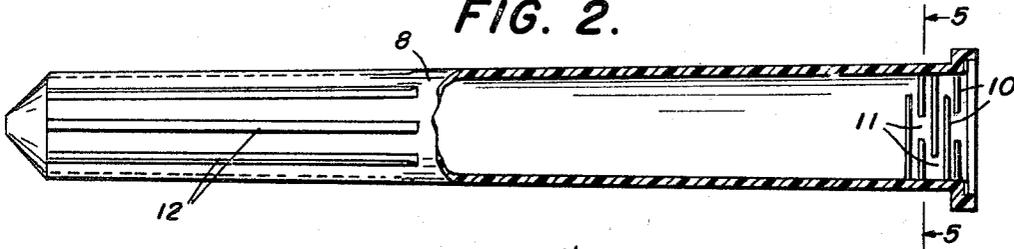


FIG. 7.

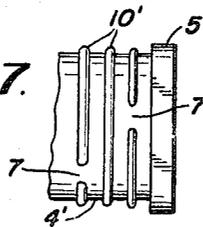


FIG. 4.

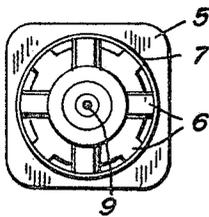


FIG. 3.

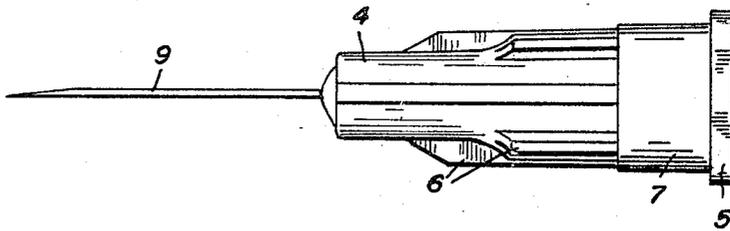


FIG. 5.

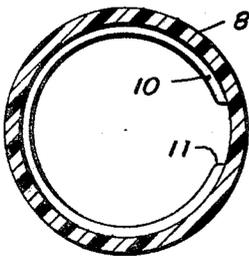
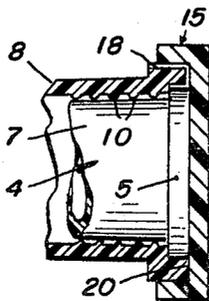


FIG. 6.



INVENTORS

GEORGE COANDA

ALFRED R. SPAETH

BY

Larry N. Berger

ATTORNEY

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3,381,813
HYPODERMIC NEEDLE AND PROTECTOR
THEREFOR

George Coanda, Burbank, Calif., and Alfred R. Spaeth,
Johnson City, Tenn., assignors to Pharmaseal Labora-
tories, Glendale, Calif., a corporation of California
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ABSTRACT OF THE DISCLOSURE

A molded hypodermic needle protector closed at one end and telescopically engageable over the needle and wedgedly engageable on the needle hub; the needle hub or protector including fragmentary ribs having portions permitting the passage of sterilization fluid thereby when the protector is disposed on the needle and hub, and the needle hub including a lateral abutment portion engaging an upper portion of the protector so constructed to permit the protector to be twisted off the hub without twisting the needle hub off the hollow tip of hypodermic syringe upon which the hub is used.

This invention relates to an improved hypodermic needle with a protector mounted directly on a hub of the needle.

In the past, a protector encasing a hypodermic needle was usually attached directly to the syringe barrel at a special adapter on the barrel. Thus, when the protector was pulled off the adapter it exposed a sterile cannula supported by a needle hub wedged on a tapered tip of the syringe barrel.

A protector mounted directly on the needle hub saves the expense of the extra adapter on the syringe barrel and makes the needle easier and safer to handle when assembling it to the syringe barrel. After the needle is manufactured it can be put directly into the protector and remain their until it is ready to be used. There is no need to put the needle on the syringe barrel first and then slip the protector down over the pointed end of the cannula. This latter procedure can be dangerous, particularly if done by hand.

Previous attempts to mount the protector directly on the needle hub have not been entirely successful because the protector often pulled the needle off the tapered tip of the syringe barrel during its removal.

It is an object of this invention to provide a protector that fits directly onto a needle hub, which protector does not pull the needle off a syringe as the protector is removed.

Another object of this invention is to provide a protector that fits directly onto a needle hub and has an improved sterilizing gas vent between the protector and hub.

Still another object of this invention is to provide a protector-encased needle for use with a hypodermic syringe, which needle can be wedgedly jammed onto a tapered tip of a syringe barrel by an axial force applied to the protector and which protector can be twistingly removed from the needle without loosening the needle from the syringe barrel tip.

An embodiment of our invention is illustrated in the attached drawings, in which:

FIGURE 1 is a side elevational view partially in section of the syringe of our invention;

FIGURE 2 is an enlarged side elevational view partially in section of the protector;

FIGURE 3 is an enlarged side elevational view of the hypodermic needle;

FIGURE 4 is a front elevational view of the hypodermic needle looking from left to right in FIG. 3;

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FIGURE 5 is a sectional view taken along line 5-5 of FIGURE 2;

FIGURE 6 is an enlarged fragmentary sectional view showing the hypodermic needle and protector used in a needle package; and

FIG. 7 is a fragmentary side elevation, similar to the right hand portion of FIG. 3, and showing the ribs of FIG. 2 formed on the needle hub of FIG. 3.

Referring now to the drawings, FIGURE 1 shows the complete hypodermic syringe. Extending from one end of barrel 1 is an axially slideable plunger 3 and at an opposite end of barrel 1 is a tapered tip 2. A tapered end of a bore in needle hub 4 wedgedly fits over tapered tip 2. This needle hub supports a cannula 9. Protector 8 having a closed end and an open end wedgedly fits on a frusto conical protector-receiving surface 7 of the hub and encases cannula 9.

A stop means or flange 5 extending outwardly from the needle hub abuts the protector 8 and limits how tightly the protector 8 can engage needle hub 4. Jamming the protector on tighter merely wedges the needle hub 4 more tightly to the tapered tip 2 of barrel 1. Thus, when the protector and the syringe barrel are grasped and twisted apart the protector separates from the needle hub 4 and does not pull off the needle hub from tapered tip 2.

After the protector 8 is removed, the needle can then be removed by grasping a wrenching surface 6 on the needle hub and twisting the needle to break it loose from the tapered tip 2 of the barrel. Wrenching surface 6 does not wrenchingly engage the protector 8 and preferably is spaced inwardly from an inside surface of protector 8. To help in twisting off the protector from the hub, the protector 8 may also have a wrenching surface 12 on an outer surface thereof.

In assembling the syringe of FIGURE 1, the needle is wedged into the protector 8. This subassembly is then staked or driven onto the tapered tip 2 of the syringe barrel until the needle hub 4 is wedged more tightly on the tapered tip 2 of barrel 1 than the protector 8 is wedged on needle hub 4.

The assembled syringe is then packaged and sterilized. To insure that sterilizing gases get into the protector and sterilize the cannula and needle hub, a slight passage is provided between the needle hub and protector. In the past, longitudinal ribs have been used inside the protector to hold the protector a distance from its support on the syringe barrel. While these longitudinal ribs work well when the protector is mounted on the syringe barrel, there are drawbacks when this protector is mounted directly on the needle hub 4. After a period of time, these longitudinal ribs form small dents in the needle hub 4 because of cold flow in plastic material. When the protector is twisted to remove it, the longitudinal ribs act as a socket wrench and twist the needle hub 4 from syringe barrel tip 2.

As shown in FIGURE 3, the ribs 10 in our invention are lateral and not longitudinal. We have found that these do not act as a socket wrench when the protector is twisted. Instead, the protector breaks loose from the needle hub 4 and pulls off the needle hub without disturbing the friction fit of the needle hub on tapered tip 2.

These laterally spaced ribs are generally C-shaped with the opening 11 in each rib 10 offset from the opening in an adjacent rib. This structure provides a tortuous path for sterilizing gases which prevents entry of bacterial contamination.

Although FIGURE 2 shows the lateral C-shaped ribs 10 on the protector, they can be molded as part of the needle hub 4 as shown in FIG. 7. The ribs 10' are molded on the protector-receiving surface 7 of the needle hub 4'.

The needle and protector combination can also be used

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in a needle package as shown in FIGURE 6. Here a removable closure 15 seals off an open end 20 of the protector 8. Thus, the needle can be completely encased with only a tortuous passage or vent 18 between the interior and exterior of the protector for sterilizing gases to pass. After the closure 15 is removed, the needle can be jammed onto a tapered Luer tip of a syringe by applying axial force to the protector and then the protector can be twistingly removed from hub 4 to expose the sterile needle.

In the above description of our invention we have used specific examples for illustrative purposes. It is understood that those skilled in the art can make certain modifications to these specific examples without departing from the spirit and scope of this invention.

We claim:

1. In combination, a hypodermic needle including a hub for wedgingly engaging a tapered tip of a hypodermic syringe barrel; and

an elongated protector having one end closed and having the opposite end open and wedgedly and twistingly removable on said needle hub,

integral, separate, lateral ribs on at least one of said hub and protector and removably engaging the adjacent confronting surface of the other of said hub and protector,

each of said ribs having at least one interruption for permitting sterilizing fluids to pass therethrough and into said protector,

said ribs being disposed generally normal to the longitudinal axis of said protector for facilitating twisting of said protector about its longitudinal axis to twist it off said hub,

said protector and hub each including wrenching surface portion for permitting said protector to be twisted off said hub and permitting said hub to be twisted off the tapered tip of said barrel, said hub including a lateral stop portion adjacent one end thereof, said protector having a terminal abutment portion adjacent said open end and removably engageable with said lateral stop portion, said lateral stop portion being so constructed and arranged with respect to said hub and protector for limiting the wedged engagement of said protector on said hub and permitting said protector to be twisted off said hub in the general direction of said ribs while said hub remains wedged on the tapered tip of said syringe barrel.

2. The structure as claimed in claim 1 in which said hub and protector include a closure removably engaging the open end of said protector.

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3. The structure as claimed in claim 2 in which said closure and said protector include cooperating passage-forming portions for permitting sterilizing fluids to pass interiorly of said hub, and exteriorly and interiorly of said needle and hub and beneath said closure.

4. The structure as claimed in claim 2 in which said ribs are integral with the inner surface of said protector, adjacent the open end thereof, and are longitudinally spaced from said open end, and said rib interruptions are circumferentially staggered and form a tortuous path for sterilizing fluids.

5. The structure as claimed in claim 2 in which said ribs are integral with the outer surface of said hub, adjacent said stop portion and longitudinally spaced therefrom, and said rib interruptions of adjacent ribs are circumferentially staggered and form a tortuous path for sterilizing fluids.

6. The structure as claimed in claim 2 in which said ribs are integral with the inner surface of said protector, adjacent said open end thereof, and are longitudinally spaced from said open end.

7. The structure as claimed in claim 6 in which the rib interruptions of adjacent ribs are circumferentially staggered and are mutually parallel forming a tortuous path for sterilizing fluids.

8. The structure as claimed in claim 1 in which said ribs are integral with the outer surface of said hub adjacent said stop portion and are longitudinally spaced therefrom.

9. The structure as claimed in claim 8 in which the rib interruptions of adjacent ribs are circumferentially staggered and are mutually parallel forming a tortuous path for sterilizing fluids.

References Cited

UNITED STATES PATENTS

2,990,079	6/1961	Garvey	215—56
3,008,570	9/1961	Roehr	128—218
3,069,040	12/1962	Corsette	215—41
3,118,448	1/1964	Gottschalk	128—218
3,164,279	1/1965	Towns	215—56 XR
3,179,107	4/1965	Clark	128—221
3,320,954	5/1967	Cowley	128—221 XR

FOREIGN PATENTS

894,653 9/1958 Great Britain.

RICHARD A. GAUDET, *Primary Examiner.*

D. L. BAKER, R. L. FRINKS, *Assistant Examiners.*