

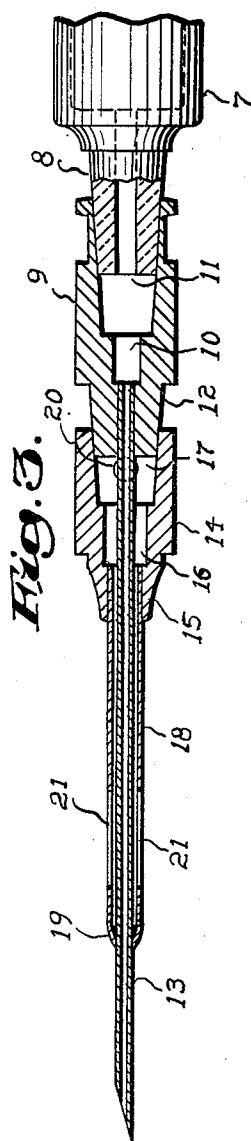
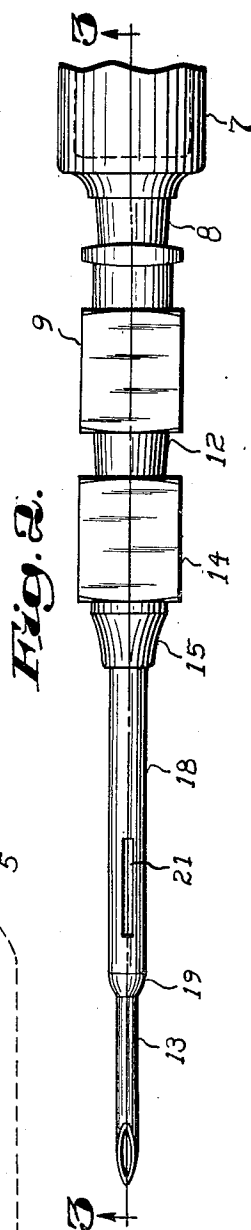
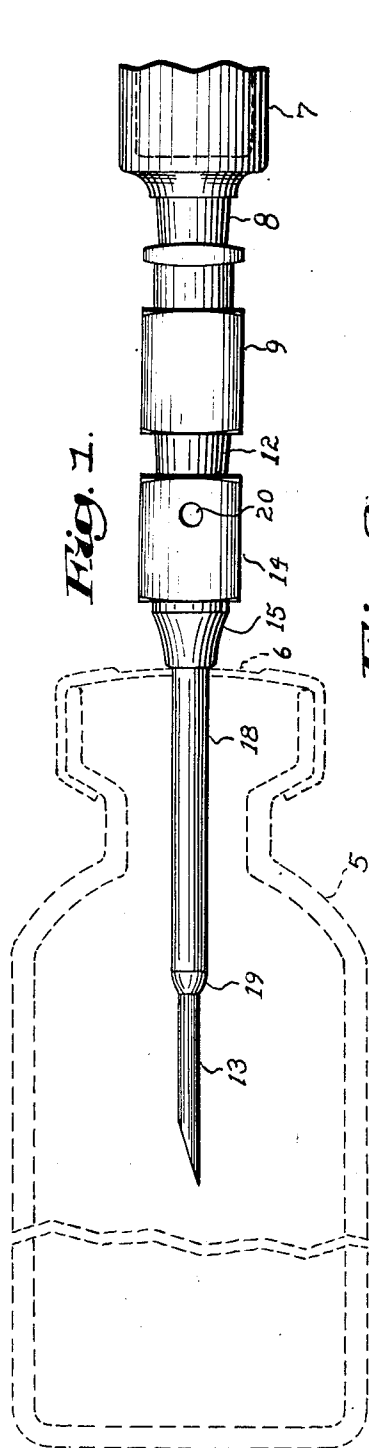
Feb. 13, 1951

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2,541,272

NEEDLE FOR FILLING OR EXHAUSTING AMPOULES

Filed April 24, 1947



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UNITED STATES PATENT OFFICE

2,541,272

NEEDLE FOR FILLING OR EXHAUSTING
AMPOULES

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Application April 24, 1947, Serial No. 743,653

7 Claims. (Cl. 226—19)

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My present invention relates to needles for use with hypodermic syringes or the like in filling or exhausting ampule vials or like sealed containers.

In accordance with my invention, I provide a needle comprising a hub having an axial passage therethrough. One end of the hub is attachable to the syringe barrel with its passage in communication with the outlet of the barrel. One end of a sleeve, the inside diameter of which is greater than the outside diameter of the cannula is sealed to the cannula adjacent one of its ends. One part of the axial passage is dimensioned to receive the sleeve and another part of it is dimensioned to receive the cannula and the other ends of the sleeve and cannula are anchored in the parts of the axial passage dimensioned to receive them. I provide the sleeve and the hub with ports so that when the needle is inserted through the cover of the vial, air that would otherwise interfere with the filling or the exhausting of the vial through the cannula as the syringe plunger is actuated, is free to flow through the sleeve.

In the accompanying drawings, I have shown an illustrative embodiment of my invention from which its novel features and advantages will be readily apparent.

In the drawings:

Fig. 1 shows a needle in accordance with my invention inserted through the rubber cap of an indicated vial.

Fig. 2 is a view similar to Fig. 1 but with the needle turned through 90°, and

Fig. 3 is a section along the lines 3—3 of Fig. 2.

At 5, I have indicated a typical vial having a rubber or like closure 6 sealing its mouth. The embodiment of my invention shown in the drawings, while having other uses, is particularly adapted for use in filling such containers as the vial 5 with penicillin or streptomycin which is accomplished by inserting a hypodermic needle through its sealed closure and then actuating the plunger of the syringe to discharge a carefully measured volume of the liquid into the vial. In such an operation, air trapped in the vial causes back pressure on the plunger and interferes with accuracy. As the construction of a hypodermic syringe is widely known, I have indicated only a syringe barrel 7 having a tapered tip 8.

In the embodiment of my invention shown in the drawings, the hub structure of my needle consists of a first hub 9 having an axial passage 10 tapered at one end as at 11 to tightly receive the barrel tip 8 with the axial passage 10 in communication with the interior of the syringe bar-

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rel 7. At its other end, the hub 9 has a tapered nose 12 which may conveniently be of the same size and shape as the barrel tip 8. Anchored in the nose 12 is a suitable cannula 13.

At 14, I have shown a second hub having a nose 15 and an axial passage 16 extending from its rear end through the nose 15. The rear end 17 of the axial passage 16 is dimensioned to receive the nose 12 which is anchored therein to securely unite the hubs 9 and 14. In the zone of the nose 15, the axial passage 16 is dimensioned to receive the rear of the sleeve 18, the inside diameter of which is greater than the outside diameter of the cannula 13.

The sleeve 18 is anchored in the nose 15 and the cannula 13 extends therethrough. Adjacent the protruding end of the cannula 13, the sleeve 18 is anchored thereto as at 19 to establish a preferably tapering juncture to enable the needle to be readily driven through the vial closure 6 without rupturing it, until the nose 15 is substantially in contact with the closure 6.

I have shown the hub 14 as having a port 20 which preferably is in communication with the axial passage 16 rearwardly of the anchored end of the sleeve 18 as may be clearly seen in Figs. 1 and 3. I form the sleeve 18 with a port 21 and this is preferably in the form of a narrow slot as may be seen in Figs. 2 and 3 to prevent its becoming clogged. In practice, there are two ports 20 and two ports 21 with the ports 20 and 21 being spaced apart 90° relative to each other thereby to enable the air passage established by the sleeve 18 to be effectively cleansed.

In filling or exhausting sealed vials with a needle in accordance with my invention, it is inserted through the closure 6 substantially to the nose 15 of the second hub 14. As the ports 21 are then inside the vial 5 and the ports 20 are open to atmosphere, the sleeve 18 serves as a conduit through which air flows into or out of the vial 5 depending on whether it is being exhausted or filled through the cannula 13.

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

1. A needle for use with a hypodermic or like syringe in filling or exhausting ampule vials or like sealed containers, said needle comprising a hub having an axial passage therethrough and being attachable at one end to the syringe barrel with said passage in communication with the barrel outlet, a cannula to pierce the seal of said vial, a sleeve for said cannula having its inside diameter greater than the outside diameter of said cannula, one end of said sleeve being

sealed to said cannula adjacent one of its ends and the other end of said sleeve terminating short of the other end of said cannula so that a substantial portion of it may extend freely into the vial through the pierced seal, said passage at the other end of said hub being dimensioned to receive said sleeve, another part of said passage being dimensioned to receive said cannula, said other ends of said cannula and said sleeve being entrant of the parts of said passage dimensioned to receive them and being anchored to said hub, and said sleeve and said hub having ports communicating with the interior of said sleeve, the port in said sleeve being located in its vial entering portion.

2. The needle of claim 1 in which there is a chamber in the hub between the parts of the passage which are dimensioned to receive the sleeve and the cannula and the port in the hub is in communication with the chamber.

3. The needle of claim 1 in which the port in the sleeve and the port in the hub are disposed at 90° from each other.

4. A needle for use with a hypodermic or like syringe in filling or exhausting ampule vials or like sealed containers, said needle comprising a hub having an axial passage therethrough and being attachable at one end to the syringe barrel with said passage in communication with the barrel outlet, a cannula to pierce the seal of said vial, a sleeve for said cannula having its inside diameter greater than the outside diameter of said cannula, one end of said sleeve being sealed to said cannula adjacent one of its ends and providing a tapering seal entering joint and the other end of said sleeve terminating short of the other end of said cannula so that a substantial portion of it may extend freely into the vial through the pierced seal, said passage at the other end of said hub being dimensioned to receive said sleeve, another part of said passage being dimensioned to receive said cannula, said other ends of said cannula and said sleeve being entrant of the parts of said passage dimensioned to receive them and being anchored to said hub, and said sleeve having a slot in its vial entering portion in parallel with its axis and said hub having a port in communication with the interior of said sleeve.

5. A needle for use with a hypodermic or like syringe in filling or exhausting ampule vials or like sealed containers, said needle comprising a first hub attachable at one end to the syringe barrel and having an axial passage therethrough in communication with the barrel outlet when the hub is attached to the barrel, a cannula to pierce the seal of said vial and anchored in said hub and protruding from its other end, a second hub having an axial passage extending therethrough of larger diameter than the passage through said first hub, a sleeve anchored in said second hub and protruding from one end thereof, the other end of said hub being attached to said first hub with said cannula extending through its passage and said sleeve and protruding beyond the end thereof, the protruding end of said sleeve being sealed to said cannula adjacent its free

end so that said sleeve has a vial entering portion of substantial length, and said sleeve and said second hub each having ports, the port in said sleeve being located in its vial entering portion.

6. A needle for use with a hypodermic or like syringe in filling or exhausting ampule vials or like sealed containers, said needle comprising a first hub attachable at one end to the syringe barrel and having an axial passage therethrough in communication with the barrel outlet when the hub is attached to the barrel, a cannula to pierce the seal of said vial and anchored in said hub and protruding from its other end, a second hub having an axial passage extending therethrough of larger diameter than the passage through said first hub, a sleeve anchored in said second hub and protruding from one end thereof, said first hub including a nose, a portion of said axial passage through said second hub being dimensioned to receive said nose thereby to interconnect said hubs with said cannula extending through said sleeve and protruding beyond the end thereof, the protruding end of said sleeve being sealed to said cannula adjacent its free end so that said sleeve has a vial entering portion of substantial length, and said sleeve and said second hub each having ports, the port in said sleeve being located in its vial entering portion.

7. A needle for use with a hypodermic or like syringe in filling or exhausting ampule vials or like sealed containers, said needle comprising a first hub attachable at one end to the syringe barrel and including at its other end a tapered tip and having an axial passage extending from end to end thereof in communication with the barrel outlets when the hub is attached to the barrel, a cannula to pierce the seal of said vial and anchored in said tip, a second hub including a tip and having an axial passage extending therethrough, a sleeve anchored in said tip of said second hub and having its inside diameter greater than the outside diameter of said cannula, said axial passage through said second hub being of greater diameter than that of said sleeve and including a portion tapered to receive said tip of said first hub and to establish a chamber of substantial size between it and said sleeve, said cannula extending through said sleeve, said sleeve being anchored to said cannula adjacent its free end so that said sleeve has a vial entering portion of substantial length and having a slot adjacent its anchored end, and said second hub having a port in communication with said chamber.

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