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2,743,724

INJECTION APPARATUS

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Fig - 1.

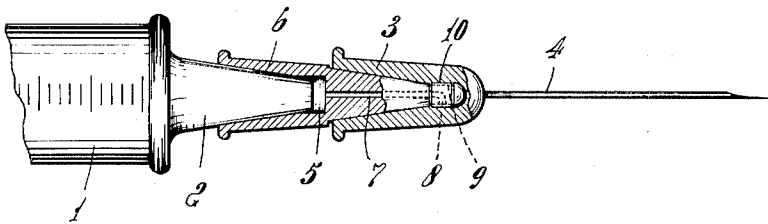


Fig - 2.

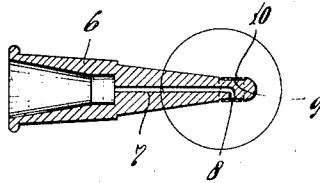
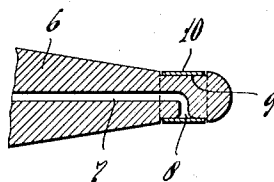


Fig - 3.



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INJECTION APPARATUS

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Claims priority, application Netherlands January 7, 1952

4 Claims. (Cl. 128—216)

The present invention relates to a hypodermic syringe of the type in which the needle-carrying member is fitted to the syringe.

It has been found in practice that when hypodermic injections are successively administered to a number of persons, cases of infection, notably with jaundice virus, may occur.

In view of the fact that after each injection the hypodermic needles were replaced by sterile needles, and all precautions, such as preventing the piston from moving in the hypodermic syringe, were taken to avoid the transfer of infectious matter, the cause of these cases of infection was initially unexplainable.

Upon continued investigation it was found, however, that when the sleeve on which the hypodermic needle is mounted is pulled off the nozzle of the hypodermic syringe, a reduction of pressure is produced in the space between the sleeve and the nozzle, as a result of which injection liquid which may have remained in the hypodermic needle and which may have been contaminated with infectious matter, will be sucked toward the syringe and will be entrained by the subsequent dose of injection liquid.

The object of the present invention is to provide an injection apparatus of a construction such that when injections are successively administered to a number of different persons with one and the same syringe, infectious matter will not be transferred from one person to another.

According to the invention, there is provided an injection apparatus in which means providing a non-return valve or another member having a similar function, is disposed between the injection needle or the like and the syringe.

A simple and practical embodiment of the invention consists in an intermediate unit provided with a non-return valve, the intermediate unit being constructed to receive the sleeve of the injection needle at one end and the nozzle of the syringe at the other.

According to the invention the member functioning as a non-return valve may consist of a piece of rubber tubing positioned at the upper end of the body of the intermediate unit and covering the outlet opening in the intermediate unit in such manner that the piece of tubing will allow the liquid supplied under pressure from the syringe to pass, but will effectively prevent the liquid from returning through the intermediate unit.

The invention will now be described in greater detail with particular reference to the drawing which shows, solely by way of example, an injection apparatus embodying features of the invention.

In the drawing,

Fig. 1 is an elevational view of the nozzle of a hypodermic syringe, showing, in longitudinal section, the sleeve of a hypodermic needle and an intermediate unit according to the invention interposed between the nozzle and the sleeve;

Fig. 2 is a longitudinal sectional view of the intermediate unit shown in Fig. 1;

Fig. 3 is a longitudinal sectional view, on an enlarged scale, of the portion of an intermediate unit which is circumscribed by the circle in Fig. 2.

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The hypodermic syringe 1 has a nozzle 2 and the hypodermic needle 4 has a sleeve 3 which is normally slipped over the nozzle of the syringe.

According to the invention an intermediate unit 6 receives the nozzle 2 of the syringe 1 as well as the sleeve 3 of the needle 4, as shown in Fig. 1.

As shown more particularly in Figs. 2 and 3, the intermediate unit 6 is formed with an axial passage 7 which, at one end of the unit communicates with a lateral outlet opening 8. This opening is covered by a piece of rubber tubing 10 positioned at the tapered end of the intermediate unit in a groove 9 which prevents the piece of tubing from being displaced.

Upon removing the sleeve 3 together with the intermediate unit 6 from the hypodermic needle 4, a reduction in pressure will occur in the space 5 between the nozzle 2 and the hollow end of the intermediate unit 6, but the piece of rubber tubing 10 will prevent the transfer of injection liquid, which may have remained behind in the needle and which may have been contaminated with infectious matter, to the nozzle 2 of the syringe.

In addition, any possibility that the injection liquid will flow back to the nozzle 2 of the syringe is eliminated, such as might occur, for example, upon retraction of the piston in the syringe.

It will be clear that the embodiment described above and shown in the drawing admits of many structural variations without departing from the invention as defined in the appended claims.

I claim:

1. An intermediate unit for use with a hypodermic syringe and a hypodermic needle carried by a sleeve, said unit comprising a body having one end shaped to receive the nozzle of the syringe and having its other end shaped to receive the needle sleeve, said body being formed with a longitudinal passage for the transfer of injection liquid from said syringe to said needle, and a non-return valve carried by said unit for controlling the flow of liquid through said passage.

2. An intermediate unit for use with a hypodermic syringe and a hypodermic needle carried by a sleeve, said unit comprising a body having one end shaped to receive the nozzle of the syringe and having its other end shaped to receive the needle sleeve, said body being formed with a longitudinal passage for the transfer of injection liquid from said syringe to said needle, and a non-return valve comprising a tubular elastic element covering the discharge end of said passage.

3. In a hypodermic syringe having a needle-carrying member, an interchangeable, intermediate unit detachably interposed between the syringe and the needle-carrying member, said unit having a longitudinal bore and a lateral outlet passage communicating with the bore near one end of said unit, said lateral outlet passage being covered by a tubular piece of elastic material serving as a non-return valve.

4. In a hypodermic syringe having a needle-carrying member, an interchangeable, intermediate unit detachably interposed between the syringe and the needle-carrying member, said unit having an outlet opening for fluid introduced into said unit from said syringe and being formed with an annular recess adjacent said opening, and a tubular element of elastic material seated in said recess and covering said outlet opening and serving as a non-return valve therefor.

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