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DEVICE FOR FILLING PNEUMATIC INJECTION SYRINGES

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Fig. 1

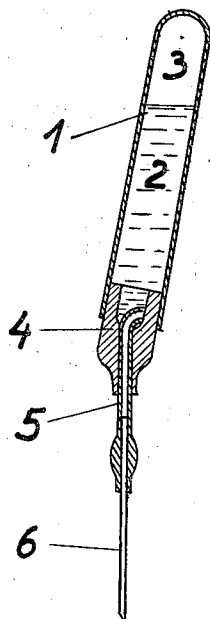
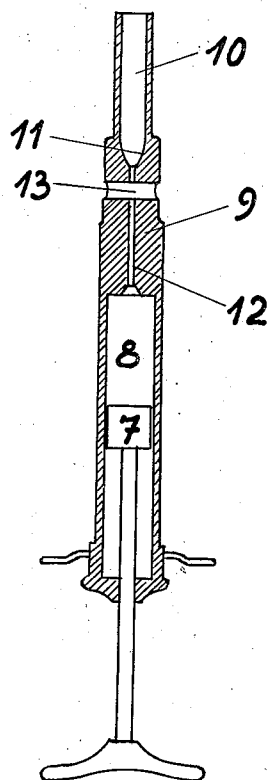


Fig. 2



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DEVICE FOR FILLING PNEUMATIC
INJECTION SYRINGES

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2 Claims. (Cl. 226—125)

This invention relates to a device for filling pneumatic injection syringes.

Reference is made to the accompanying drawing in which

5 Fig. 1 shows a sectional view of a pneumatic injection syringe, and

Fig. 2 shows a sectional view of a filling device for filling a pneumatic injection syringe according to this invention.

10 Injection syringes in which the fluid is under excess pressure, by which pressure the fluid is automatically driven out on opening a valve, are known. Figure 1 of the accompanying drawing illustrates such pneumatic injection syringe. It
15 consists of a glass receptacle 1 in which the injection fluid 2 and a compressed air column 3 are present, an inlet and outlet valve which is formed by an elastic hollow stopper 4 and a glass tube 5 bent at a right angle, and an injection needle 6 placed upon the said glass tube.
20 The short end of the glass tube bent at the right angle has its open end tightly pressed against the inner wall of the hollow stopper (valve closed). By proper movement of the glass tube
25 its open end can be lifted from the wall of the stopper (valve open) so that the injection fluid can be brought into the glass tube and needle and is ejected therefrom under the influence of the compressed air.

30 Pneumatic injection syringes of the said kind hitherto were filled by piercing through the hollow stopper 4 at any desired place by means of an auxiliary cannula and introducing with pressure the fluid and/or the compressed air to be
35 filled in through the said cannula into the glass tube. After the glass tube has been filled the auxiliary cannula is drawn off the hollow stopper and the place where it pierced through closes automatically because of the elasticity of the
40 stopper.

It has now been established that in syringes of the said kind the closure of the stopper at the place where the auxiliary cannula was inserted is not tight enough to avoid with certainty
45 that the fluid either wholly or partially escapes from the receptacle 1 in the case of, for instance, prolonged or too warm storing.

In accordance with the present invention this disadvantage can be overcome by inserting the
50 fluid through the needle 6 under excess pressure, for instance, by means of a filling pump, into the receptacle, whereby simultaneously compression of the gas present in the receptacle is effected.

The following device has proved to be particularly suitable for the said purpose. It consists

of a filling pump of the usual construction, in which a connecting joint consisting of a wide tube which gradually reduces its width—while avoiding any edges—to form a narrow boring
5 and which connecting joint has a suction channel in vertical direction to the boring, forms the end of the cylinder of the filling pump. The suction channel is preferably attached very near the constriction of the wide boring of the connecting joint. The diameter of the wide tube of
10 the joint must be so that it can receive the glass tube serving for holding the needle and the usually conically shaped point of the hollow stopper. The diameter of the narrow boring is fitted to the outer diameter of the needle with an exacti-
15 tude of about 1 to $\frac{5}{100}$ part of a millimeter for obtaining the necessary tightness between the wall of the boring and the needle to be inserted. The length of the joint is preferably so that the needle of the pneumatic injection syringe does
20 not reach into the cylinder of the filling pump in order to avoid the breaking off of the point when the piston of the filling pump is pressed down.

The annexed drawing illustrates a particularly
25 suitable form of the filling device and an advantageous manner of filling it. In the filling pump illustrated in Figure 2, 7 is the piston of the filling pump, 8 the cylinder serving for taking up the fluid, 9 the connecting joint, 10 the boring
30 with the wide diameter, 11 the constriction of the wide boring, which part has no edges, 12 the narrow boring, and 13 the suction channel crossing the narrow boring.

For filling the pneumatic injection syringe il-
35 lustrated in Figure 1 the filling pump as shown in Figure 2 is dipped into the fluid to be filled in, with the piston pressed down so that the suction channel is below the level of the fluid. The air contained in the wide boring 10, the constriction
40 11 and the suction channel 13 escapes through the said suction channel, so that on drawing off the piston, the pump is filled with the fluid without the formation of bubbles. Then the needle of the pneumatic syringe is inserted into the
45 wide and then into the narrow boring of the connecting joint of the filling pump. The connection of the suction channel with the cylinder of the filling pump is thereby interrupted. For facilitating the insertion of the needle into the
50 exactly fitting narrow boring any formation of edges is avoided at the constriction 11. After the needle has been inserted into the narrow boring the valve of the pneumatic syringe is opened in the usual manner and the fluid is
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pressed into the receptacle by pressing down the piston 7 of the pump into the cylinder 8. After the valve has closed filling is complete. The quantity of gas or air being present in the empty receptacle is compressed by pumping in the fluid so that a compressed gas or air column 3 is formed, which suffices to drive out the fluid 2 as soon as the valve of the syringe is opened. If a further excess pressure is desired, it is possible to introduce air or gas into the already filled syringe in a second working stage.

While I have described my improvements in great detail and with respect to preferred embodiments thereof, we do not desire to limit ourselves to such details or embodiments, since many modifications and changes may be made and the invention embodied in widely different forms without departing from the spirit or scope of the invention in its broadest aspects. Hence I desire to cover all modifications and forms within the scope or language of any one or more of the appended claims.

I claim:

1. A device for filling a pneumatic injection syringe having a closure stopper and a discharge

needle which comprises a filling pump provided with a connecting member designed to join the closure stopper and discharge needle of the syringe, said member consisting of a tube having a diameter sufficiently wide to receive the closure stopper, but tapering off conically towards the pump to form a narrow boring into which the needle penetrates in operative assembly of the pump and syringe, and having a suction channel which crosses the said boring.

2. A device for filling a pneumatic injection syringe having a closure stopper and a discharge needle which comprises a filling pump provided with a connecting member designed to join the closure stopper and discharge needle of the syringe, said member consisting of a tube having a diameter sufficiently wide to receive the closure stopper, but tapering off conically towards the pump to form a narrow boring into which the needle penetrates in operative assembly of the pump and syringe, and having a suction channel crossing the said narrow boring at a point close to the conic constriction of the tube.

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