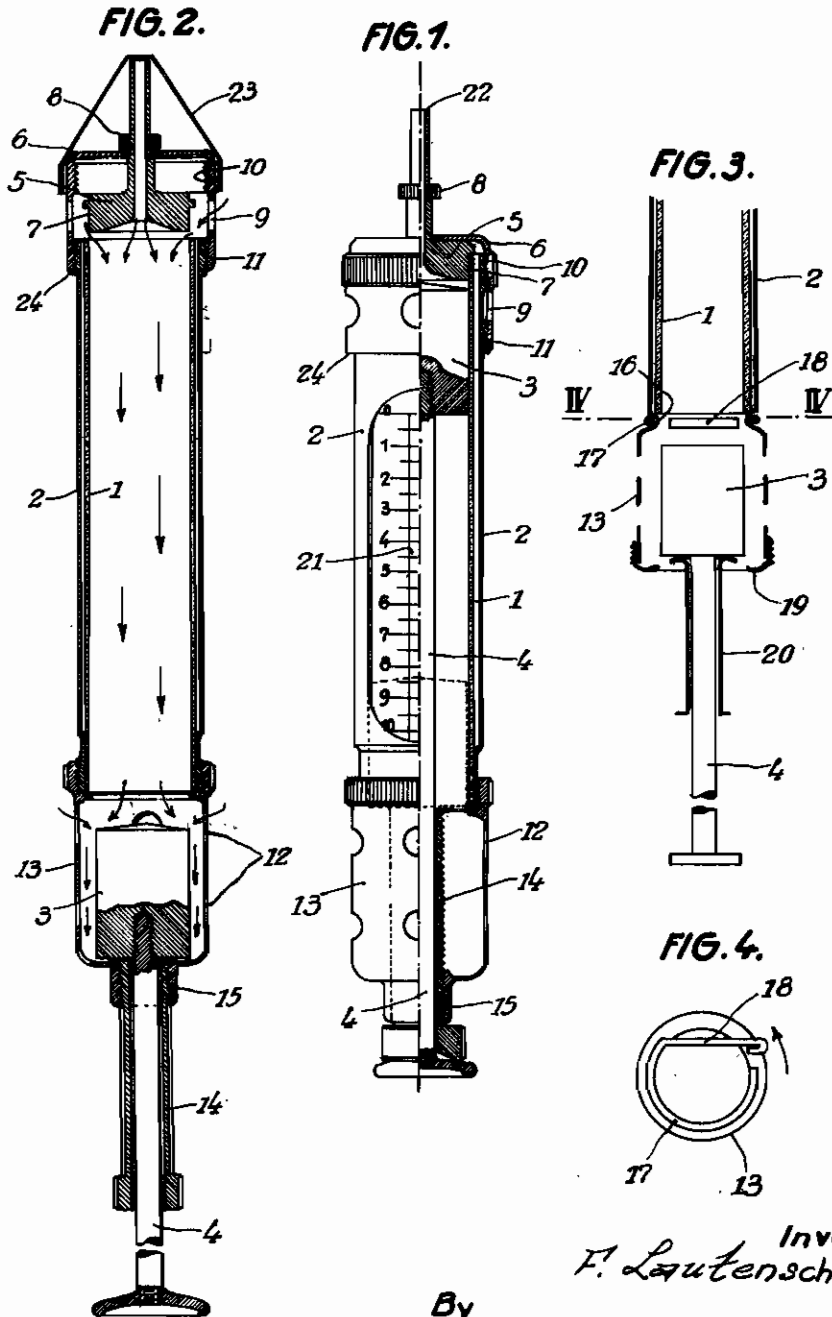


PUBLISHED  
MAY 11, 1943.  
BY A. P. G.

F. LAUTENSCHLÄGER  
SYRINGE FOR MEDICAL PURPOSES  
Filed Aug. 2, 1941

Serial No.  
405,261



Inventor  
*F. Lautenschläger*  
By *Glascok Downing & Debold*  
Attorneys

# ALIEN PROPERTY CUSTODIAN

## SYRINGE FOR MEDICAL PURPOSES

Franz Lautenschläger, Berlin-Nikolassee, Germany; vested in the Alien Property Custodian

Application filed August 2, 1941

Hitherto, syringes for medical purposes, for example injecting syringes and the like, have been sterilized by taking to pieces the syringe, the parts of which, i. e. the cylinder with the short canula on the one hand and the piston with the rearward cylinder lid on the other hand, being separately sterilized in steam. This manner of sterilizing has the disadvantage that, in spite of taking to pieces the syringe, not all important parts of the syringe are reliably sterilized. In addition, when reassembling the sterilized parts of the syringe, there is the danger of reinfecting it.

The present invention is based upon the fundamental idea of sterilizing the syringe in its assembled state, but to loosen the parts of the syringe in such a manner that the steam is given free access to all parts of the syringe coming into contact with the liquid to be injected. For this purpose, the invention provides at the front end of the cylinder for fixing the short canula a perforated cap nut, which is screwed on to the glass cylinder or its protective tube, and which, when being loosened, draws the short canula out of the glass cylinder, whereas at the rear end of the cylinder there is provided a widened and likewise perforated extension of the protective tube or of the glass cylinder, into which extension the piston of the syringe may be drawn completely.

Two constructional examples of the invention are illustrated in the accompanying drawing, in which:

Fig. 1 is a view of an injecting syringe, one half of which is shown in longitudinal section;

Fig. 2 is the same injecting syringe with the parts of the syringe loosened when being sterilized;

Fig. 3 is a sectional view of the rear end of an injecting syringe in a somewhat different construction; and

Fig. 4 is a section on the line IV—IV of Fig. 3. The syringe illustrated in Fig. 1 is composed of the following parts:

A glass cylinder 1, a protective tube 2 made of metal and surrounding said cylinder, a piston 3 with a piston rod 4, and a short canula 5 which is fixed by means of a cap nut 6 screwed on to the tube 2.

As will be seen from Fig. 1, the liquid to be injected, which is contained in the cylinder 1, may, owing to the capillary action, also get between the cylinder 1 and the short canula 5. Since the short canula 5 was hitherto rigidly connected with the cylinder 1 while being sterilized, there

was the great danger of the short canula not getting sterilized at the place 7.

According to the invention, the arrangement is made so that, when loosening the cap nut 6, the short canula 5 is at the same time drawn out of the glass cylinder, as shown in Fig. 2. This automatical withdrawing of the short canula may be constructively effected in various manners. In the constructional example illustrated, an adjustable nut 8 is provided on the short canula, against which nut bears the cap nut 6 as in Fig. 2 and, therefore, draws the short canula out of the glass cylinder and lifts it off the latter far enough to let the sterilizing steam enter the cylinder 1 through openings 9 in the cap nut 6 in the direction of the arrows. Consequently, the above mentioned place 7 of the short canula is also sterilized in a perfect manner.

In the advantageous construction illustrated, the cap nut 6 has two spaced thread pieces 10 and 11, between which the perforations 9 are arranged. This construction facilitates a rapid loosening of the cap nut on the protective tube 2. Besides, the thread piece 11 is so arranged that, after loosening the thread 10, the short canula 5 may be securely drawn out of the glass tube, as shown in Fig. 2. If desired, there may be provided a stop or the like, which prevents the cap nut from being completely screwed off. It is important that this cap nut is merely loosened, but not completely screwed off.

In order to be able to perfectly sterilize the piston 3 of the syringe together with the syringe, the invention provides at the rear end of the cylinder an extension 13 of the protective tube with perforations 12, into which extension the piston may be drawn completely, as shown in Fig. 2. Consequently, the sterilizing steam can flow on all sides round the piston, as indicated by arrows.

Furthermore, there is provided on the extension 13 of the protective tube an adjustable stop for the piston, which stop prevents the piston from being accidentally drawn out of the glass cylinder. In the construction shown in Figs. 1 and 2, this stop consists of a threaded tube 14 serving to guide the piston rod 4, which threaded tube may be screwed in a projection 15 of the extension 13.

In the construction shown in Figs. 3 and 4, the extension 13 of the protective tube 2 is a part of the protective tube 2, both together forming one single piece. At the place 16 there is a bead serving as a stop for the glass cylinder 1. This bead may also be used for inserting a spring 17, which is fastened to the tube 2 by soldering or

the like, and whose movable portion 18 projects into the protective tube in such a manner that the piston rod 3 cannot be pushed past. When the piston in the glass cylinder 1 is to be drawn out of the cylinder into the position shown in Fig. 3, it is necessary to first press the arm 18 of the spring in the direction of the arrow out of the protective tube. This is also necessary when the piston, in its position shown in Fig. 3, is to be pushed back into the glass cylinder. In the construction according to Fig. 3, a lid 19 is screwed on to the extension 13, which lid has a guide 20 for the piston rod 4.

In the syringe according to the invention, the scale 21 for indicating the contents is arranged on the glass cylinder in such a manner that it may be read at the rear end of the piston. This has the advantage that the reading is more accurate, and in addition, it makes it possible to make the syringe shorter.

In order to securely prevent a reinfection of the sterilized syringe when fixing a canula, by touching the short canula at 22, a protective cap 23, which is pervious to steam, is passed over the short canula.

The syringe described above is preferably sterilized in vertical position, advantageously in the position illustrated in Fig. 2. During this operation, the syringe may be suspended by means of a fork or the like, supporting the syringe under the edge 24 of the cap nut 6.

The invention is not limited to the above described construction of a syringe. If desired, the syringe may be made without a protective tube or substantially of glass. In this case, the extension 13 shown in Fig. 3 and the glass cylinder would consist of one piece and the extension would be a widened portion of the glass cylinder.

FRANZ LAUTENSCHLÄGER.