

P. S. PITTENGER,
HYPODERMIC SYRINGE,
APPLICATION FILED JUNE 23, 1919.

1,373,669.

Patented Apr. 5, 1921.

Fig. 1.

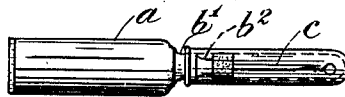


Fig. 2.

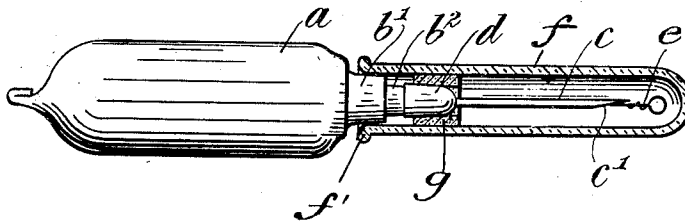
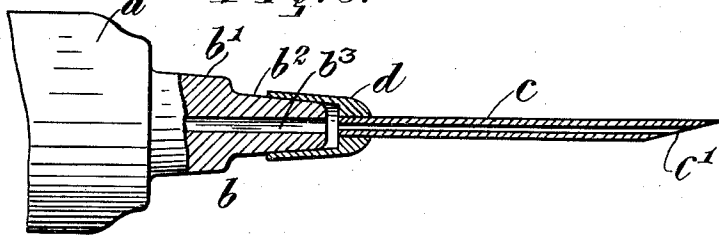


Fig. 3.



WITNESS

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HYPODERMIC SYRINGE.

1,373,669.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, PAUL S. PITTENGER, a citizen of the United States, residing in Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Hypodermic Syringes, of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention relates to hypodermic syringes of the type in which the needle is fastened permanently to a collapsible capsule with a practically nonrenewable connection.

Syringes of this type as heretofore known, while solving many difficulties attendant upon hypodermic medication, have been difficult and expensive to manufacture. In fact, it has been found that in the manufacture of such syringes by known methods more than fifty per cent. of the joints effected between the capsule and needle are failures. Further, the labor and skill required to effect the operations which determine the correct alinement of the needle with relation to the capsule add to the cost.

The principal object of this invention is to provide a syringe of the type referred to above in which the needle is attached to the capsule by an improved method which reduces substantially the total cost by eliminating the expensive operations heretofore required and practically removing all chances of failure from a loose joint or a disalined needle.

In accordance with this phase of the invention the neck of the capsule is tapered exteriorly and the needle at its base is formed with or attached to a correspondingly tapered hub which may be pressed on to the neck to form a practically nonrenewable connection therewith.

Another object of the invention is to provide an improved method of attaching the glass needle cover to the neck of the capsule. In known syringes it is usual to cement this glass tube to the annular flange of a nut and to thread this nut on to the exteriorly threaded neck of the capsule. This method is objectionable for the reason that the cement does not always adhere to all portions of the glass at the line of union and, during sterilization, the cover separates from the nut, requiring the reunion of the

cover with the nut and the resterilization of all parts of the package. Another objectionable feature is the cost of this method, the labor, material and machine work all being relatively expensive.

By the improved method the glass cover is tapered interiorly at its open end and an annular cork is interposed between this tapered section and the exteriorly tapered neck of the capsule, the cork affording a suitable frictional engagement between the cover and the capsule.

For a detailed description of one embodiment of the invention, reference is to be had to the accompanying drawing, in which—

Figure 1 shows an assembled unit.

Fig. 2 is a view, on a somewhat larger scale, of the unit shown in Fig. 1, the cork and glass cover being in section to show clearly the method of attaching the cover to the capsule.

Fig. 3 is a fragmentary view, partly in elevation and partly in section, of a capsule and needle showing the improved nonrenewable connection therebetween.

Referring first to Fig. 3, it will be seen that the capsule *a* has formed thereon a neck *b* which may be tapered exteriorly at its base, as at *b'*, and be formed with an end of somewhat lesser diameter tapered exteriorly, as at *b²*. The invention is not to be limited to this construction as it will be evident as the description proceeds that the exteriorly tapered neck *b* might be uniformly tapered from base to end. The interior of the neck *b* is bored centrally, as at *b³*, this bore being of any desired diameter and constituting, as usual, the sole outlet for the contents of the hermetically sealed capsule. The needle *c* is secured at its base to a compressible hub *d* which may be readily slipped on to the tapered section *b²* of the neck *b* and pressed thereon in a suitable press to form a permanent and practically nonrenewable connection between the needle and the capsule, thereby preventing the use of the needle with another syringe. The diameter of the bore *c'* of the needle may be approximately the same or less than the diameter of the bore *b³* of the neck with which it is alined, the relative sizes of these bores being immaterial since the function of each is merely to permit the discharge of the contents of

the capsule. Through these alined bores b^3 and c' passes the usual wire stylet e for the purpose of closing the outlet until the syringe is to be used when the stylet is withdrawn.

In practice, the hub d may be united with the needle c by pressing it thereon. The stylet e may then be passed through the bore c' of the needle c and the compressible hub d slipped on to the tapered section b^2 of the neck b . With the parts in this position, the hub is pressed permanently on to the neck by suitable means, such as a punch press, the resulting joint being practically nonrenewable.

By this improved method all machining operations are eliminated; no exact measurements of any of the parts are required; and no particular skill or amount of labor is involved in the final assembling and union of the parts. These factors being eliminated there is practically no chance of failure through a loose joint or a disalined needle.

Referring now to Fig. 2, the method of securing the glass cover f to the capsule will be clear. This cover f is tapered at its open end, as at f' . Between the tapered section b^2 of the neck and the inner wall of the cover is interposed an annular washer g of cork or other suitable material which becomes wedged snugly between the tapered section and the cover when the latter is slipped into place. At the same time the tapered end f' of the tube engages the tapered section b' of the neck, the result being a firm frictional and practically hermetic union between the glass cover and the neck. The advantages of this method are that no machine work is required, no cement is employed, no nut or other mechanical union is present, and in assembling and disassembling greater facility than heretofore is derived.

It will be appreciated, as noted above, that the invention is not limited to the described relation between the various tapered surfaces nor to the relation of the washer g to these surfaces, since the same principle may be employed with many variations of form.

The scope of the improvements will be defined in the appended claims.

I claim as my invention:

1. A hypodermic syringe comprising a collapsible capsule, a neck of relatively incompressible material on the capsule pro-

vided with a discharge duct, a needle formed with a discharge duct for alinement with the first named duct and a compressible hub carried by the needle and adapted to be pressed on to the exterior of said neck to form a practically nonrenewable connection between the needle and the capsule.

2. A hypodermic syringe comprising a collapsible capsule, a neck of relatively incompressible material on the capsule provided with a discharge duct and tapered exteriorly, a needle formed with a discharge duct for alinement with the first named duct and a compressible hub carried by the needle and adapted to be pressed on to the tapered exterior of said neck to form a practically nonrenewable connection between the needle and the capsule.

3. A hypodermic syringe comprising a collapsible capsule, a neck of relatively incompressible material on the capsule provided with a discharge duct and tapered exteriorly, a needle formed with a discharge duct for alinement with the first named duct and a compressible hub tapered similarly to the tapered neck and adapted to be pressed on the tapered exterior of said neck to form a practically nonrenewable connection between the needle and the capsule.

4. A hypodermic syringe comprising a collapsible capsule, a neck of relatively incompressible material on the capsule provided with a discharge duct, a needle formed with a discharge duct for alinement with the first named duct and a compressible hub pressed on the base of the needle to form a permanent connection therewith and adapted to be pressed on to the exterior of said neck to form a practically nonrenewable connection between the needle and the capsule.

5. In combination with a hypodermic syringe and needle therefor, a neck of relatively incompressible material on the syringe having exteriorly tapered sections, a glass cover for the needle having its inner wall tapered adjacent its end for engagement with one of the said tapered sections of the neck, and an annular compressible washer adapted to be compressed between the glass cover and the other of said tapered sections to form a practically airtight frictional joint between the cover and the neck.

This specification signed this 19th day of June, A. D. 1919.

PAUL S. PITTENGER.