Jan. 5, 1932. M. NEVIN 1,839,695

HYPODERMIC SYRINGE

Filed June 6, 1928

Fig. 1

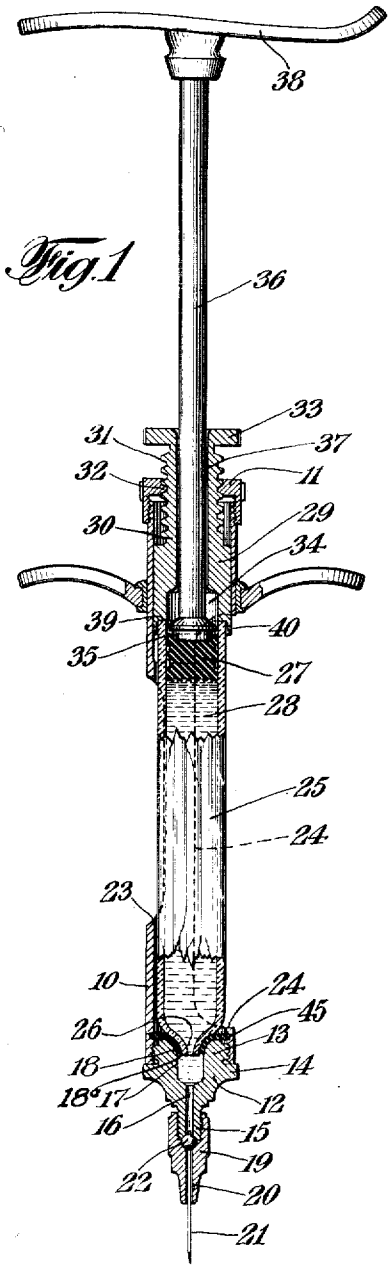


Fig. 2.

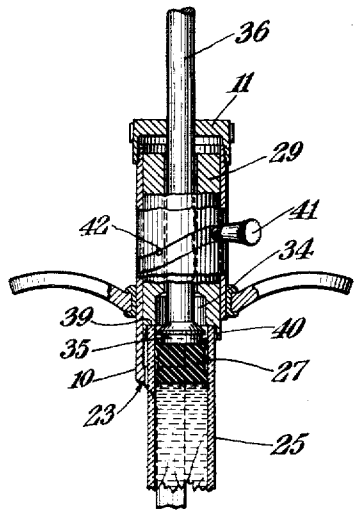




Fig. 3.

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UNITED STATES PATENT OFFICE

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HYPODERMIC SYRINGE

Application filed June 6, 1928. Serial No. 283,217.

This invention relates to hypodermic syringes and the like and particularly to those types in which an ampule containing medicament is removably mounted in the barrel of the syringe.

The object of this invention is to provide simple, efficient and easily operated means whereby the ampule, when placed in the syringe barrel, can be quickly and positively clamped in place, and the clamping means as quickly and easily released when desired.

Further and more specific objects, features and advantages will appear from a consideration of the drawings and the detailed description hereafter set forth, when taken in conjunction with the claims.

Preferred forms of the invention are shown in the drawings, in which

Fig. 1 is a longitudinal sectional view through one form, and

Fig. 2 is a partial similar view through another form, and

Fig. 3 is an elevation of the ampule before it is placed in the syringe barrel.

The form shown in Fig. 1 comprises an elongated cylindrical barrel 10 exteriorly threaded at one end to receive a cap 11. The other end of barrel 10 is interiorly threaded to receive a cap or head 12 having an exteriorly threaded plug 13 and a flange 14 abutting the end of the barrel 10. The outer end of cap 12 is provided with an exteriorly threaded extension 15 having a small bore 16 extending through to a curved recess or seat 17 on the inner face of plug 13. This seat 17 is preferably provided with a soft cup-shaped rubber lining or resilient packing 18 having a central pierced portion 18*a*, with which the end of the ampule is adapted to make fluid tight connection. The upper end of this packing 18 is flared out and lies in a groove 45 formed on the inner wall of the barrel 10 and thus the outer edge of the packing is engaged by means on the barrel 8 to securely hold it in position. A needle supporting nut or thimble 19 is interiorly threaded at one end to screw on to extension 15 and has a bore 20 aligned with bore 16. A hollow hypodermic needle 21, having a ball 22 near one end, is disposed in bores 16 and 20 with the ball 22 gripped between the end of extension 15 and the inner face of thimble 19.

The barrel 10 is cut away at 23 to some extent and to a larger extent on the opposite side at 24. Through this larger opening 24, an ampule 25 can readily be inserted. This ampule 25 is a cylindrical container, preferably of glass, having a tapered sealed end 26 and a plug or piston 27 of soft rubber in the other end. The ampule 25 contains anaesthetic medicament 28 which is prepared and placed in the ampule and sealed therein under most stringently antiseptic conditions. When the ampule 25 is to be placed in the barrel 10 preparatory to an injection, the sealed end 26 is broken off thus opening the lower end of the ampule which is seated on the soft rubber lining 18. The chamber in the barrel 10 to receive the ampule 25 is necessarily of ample dimensions to permit the easy insertion of the ampule 25. Therefore, when the ampule 25 is inserted in place, I provide simple means to engage the upper end of the ampule 25 to hold the lower end 26 firmly on its cushioned seat to make a tight joint at that point.

This ample clamping means may comprise a longitudinally movable member such as a sleeve or plug 29, disposed in the upper end of the barrel and having a stem 30 provided with exterior threads 31 of preferably large pitch to engage similar threads on a bore 32 in cap 11. The outer end of stem 30 is provided with a knurled knob 33 to permit manual exterior operation of the plug 29 to advance or retract it with respect to the end of ampule 25. The lower end of sleeve or plug 29 has a recess 34 to accommodate the head 35 which is screw threaded on the end of a shaft or piston rod 36 which slidably extends through bore 37 in sleeve 29 and has an operating handle 38 on its outer end.

Adjacent the end 39 of the sleeve 29 which abuts the end of ampule 25, the sleeve 29 is provided with a depending peripheral rim or flange 40, extending down the side wall of the ampule the flange being of less length than the ampule, and the inner face of which is downwardly and outwardly beveled or flared and serves to embrace the upper end

of the ampule 25 to better hold it in place. When the ampule 25 is thus engaged in operating position, the handle 38 can be pushed in, forcing the head 35 on shaft 36 forward against the piston plug 27 to move it forward in the ampule 25 and expel the medicament 28 through the bore 16 and through the needle 21 as desired.

In the form shown in Fig. 2, the construction of the lower end of the syringe is the same and the upper end only differs, as follows: The barrel 10 is closed by cap 11 through a bore in which piston rod 36 extends and has on its lower end the head 35 adapted, when operated, to press against piston plug 27 and, when withdrawn, to lie in recess 34 in the sleeve 29 which is slidably mounted within the upper end of the barrel 10. This sleeve is advanced or retracted with respect to the upper end of ampule 25 by means of a handle pin 41 thereon, which extends through an inclined or spiral slot 42 in the wall of barrel 10. The lower end of the sleeve 29 is constructed as in Fig. 1. To advance the sleeve 29 the pin is moved to one end of slot 42 toward the other, and to retract it it is moved toward the other end. When the sleeve or clamping means 29 is advanced by the operation of either means shown in Figs. 1 or 2, it will firmly engage the end of the ampule 25 to force it firmly and positively against the packing 18 and lock it positively in position even against back pressure which may arise when the piston plug 27 is being advanced to force the medicament 28 out through the needle 21. Consequently the joint between the lower end of ampule 25 and packing 18 remains tight at all times because of the positive manual pressure applied to the ampule. This positive seating of the ampule is in contradistinction to the use of springs or spring pressure to hold the ampule in place, the use of which will not insure a positive tight joint against developed back pressure.

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

What I claim is:

1. A syringe having a barrel and a removable ampule therein, a resilient sheet of packing in the barrel against which the peripheral end of the ampule bears to form a tight joint, said barrel having a groove therein to receive one edge of the packing to hold it in place, and means for ejecting the contents of the ampule.

2. A syringe having a barrel having a side entrance for an ampule a removable ampule in said barrel, a resilient packing in the barrel against which one end of the ampule bears to form a tight joint, said barrel having a groove therein to receive one edge of said packing, a movable flanged sleeve, the flange being of less length than the ampule within the barrel abutting the other end of the ampule, and manually operable means on the outside of the barrel for moving and positively holding said member against the end of the ampule to maintain said tight joint against developed back pressure.

3. A syringe having a barrel to receive a removable ampule with a tapered broken end therein, a head connected to one end of said barrel having a tapered recess, a resilient packing in the end of said barrel lying between said tapered end and said tapered recess, a movable member at the opposite end of the barrel for dispensing the fluid from said ampule, means within said barrel for forcing the said ampule against said packing and positively locking it thereagainst to provide a leak-tight joint and means externally of said barrel for operating the last-named means.

4. A syringe having a barrel to receive an ampule with a tapered end therein, said barrel having a portion shaped to receive said tapered end when broken, a resilient packing shaped like said tapered end and lying between said end when in position and the similarly formed wall of said barrel, a movable member abutting against the opposite end of the ampule when the latter is in position, and means operative exteriorly of the barrel connected to the movable member to move the ampule towards the packing and lock it positively against said packing to form a tight joint.

5. A syringe having a barrel, a removable ampule in said barrel having a tapered open end, a resilient packing in one end of said barrel placed to lie against the tapered end of said ampule, a movable member at the opposite end of said barrel having a portion abutting the end of the ampule and means operative exteriorly of said barrel and connected to the movable member to move the ampule towards said packing and lock it positively thereagainst.

6. A syringe having a barrel, a removable ampule in said barrel having a tapered open end, a resilient packing in one end of said barrel placed to lie against the tapered end of said ampule, a rotatable screw-threaded member at the opposite end of said barrel having a portion abutting the end of the ampule and means operative exteriorly of said barrel and connected to the rotatable member to move the ampule towards said packing and lock is positively thereagainst.

7. A syringe having a barrel, a removable

ampule in said barrel having a tapered open end, a resilient packing in one end of said barrel placed to lie against the tapered end of said ampule, a rotatable screw-threaded member at the opposite end of said barrel having a portion abutting the end of the ampule, said member having a head attached thereto exteriorly of the barrel to be rotated to move the screw-threaded member and thereby the ampule towards the resilient packing and lock its tapered end thereagainst to form a tight joint.

8. A syringe having a barrel, an entrance for an ampule therein, a removable glass ampule having a tapered open end to be placed in said barrel, said barrel having an end portion shaped to receive the tapered end of said ampule, a cup-shaped rubber packing pierced in the center thereof lying in said end of said barrel, the cup being adapted to receive the tapered end of the ampule and to lie between the outer side walls of said ampule and the inner side wall of the head and a rotatable screw-threaded sleeve-member co-operating with the screw threads in the oposite end of the barrel, said sleeve member having a flanged portion surrounding the end of the ampule, said sleeve member being provided with a head exteriorly of the barrel to permit manual rotation of said member to advance it and thereby advance the ampule longitudinally of the barrel and to lock it against the rubber cup to make a leak-tight joint.

In testimony whereof I have signed my name to this specification.

MENDEL NEVIN.

ampule in said barrel having a tapered open end, a resilient packing in one end of said barrel placed to lie against the tapered end of said ampule, a rotatable screw-threaded member at the opposite end of said barrel having a portion abutting the end of the ampule, said member having a head attached thereto exteriorly of the barrel to be rotated to move the screw-threaded member and thereby the ampule towards the resilient packing and lock its tapered end thereagainst to form a tight joint.

8. A syringe having a barrel, an entrance for an ampule therein, a removable glass ampule having a tapered open end to be placed in said barrel, said barrel having an end portion shaped to receive the tapered end of said ampule, a cup-shaped rubber packing pierced in the center thereof lying in said end of said barrel, the cup being adapted to receive the tapered end of the ampule and to lie between the outer side walls of said ampule and the inner side wall of the head and a rotatable screw-threaded sleeve-member co-operating with the screw threads in the oposite end of the barrel, said sleeve member having a flanged portion surrounding the end of the ampule, said sleeve member being provided with a head exteriorly of the barrel to permit manual rotation of said member to advance it and thereby advance the ampule longitudinally of the barrel and to lock it against the rubber cup to make a leak-tight joint.

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CERTIFICATE OF CORRECTION.

Patent No. 1,839,695. **Granted January 5, 1932, to**

MENDEL NEVIN.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, lines 60 and 61, claim 1, for the words "the peripheral" read one, and line 63, same claim, for "one" read the peripheral; same page line 129, claim 6, for "is" read it; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of February, A. D. 1932.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

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