

July 14, 1936.

R. A. KAUFFMAN

2,047,512

HYPODERMIC SYRINGE

Filed Feb. 12, 1934

Fig. 1

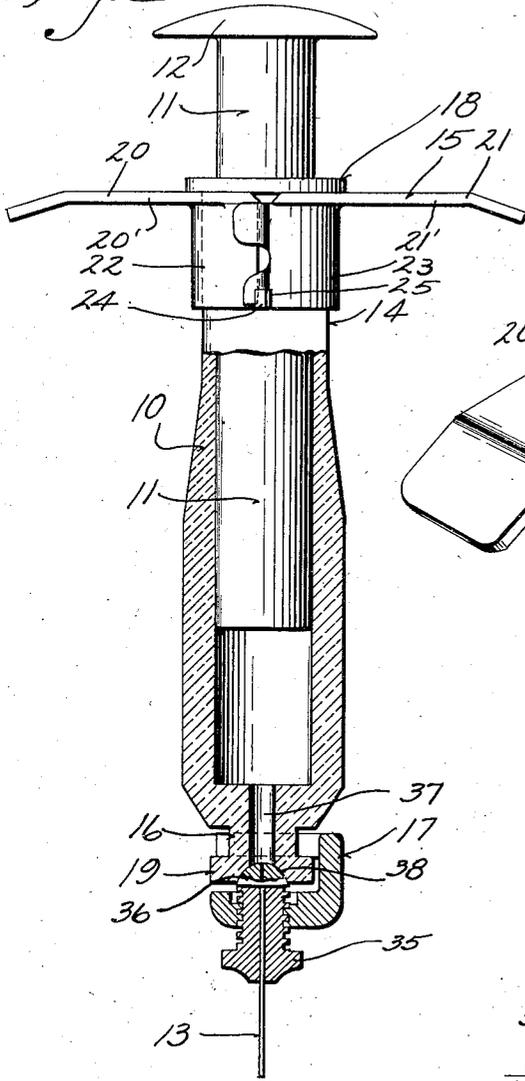


Fig. 2

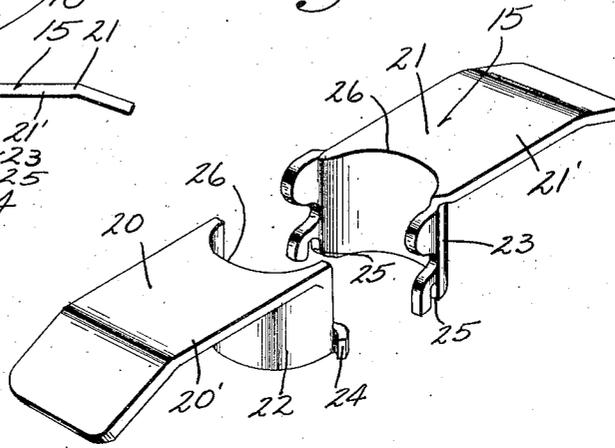


Fig. 3

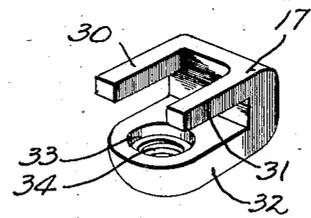


Fig. 4

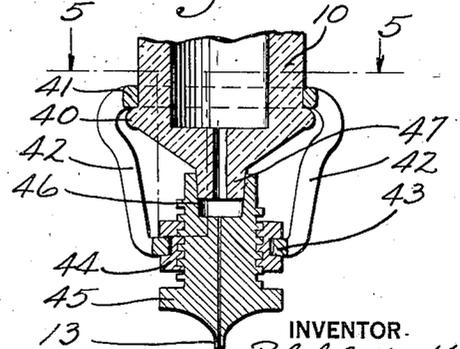
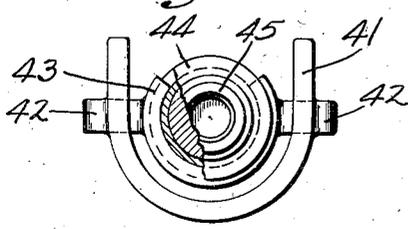


Fig. 5



INVENTOR.
Ralph A. Kauffman
BY
Muller, Muller & Muller
ATTORNEYS

UNITED STATES PATENT OFFICE

2,047,512

HYPODERMIC SYRINGE

Ralph A. Kauffman, Denver, Colo.

Application February 12, 1934, Serial No. 710,873

6 Claims. (Cl. 128—224)

My invention relates to improvements in hypodermic syringes.

The object of my invention is to provide a hypodermic syringe including a barrel of glass or other suitable close grained material which is easily aseptitized and which is so constructed as to receive needle fittings and handle fittings which are strong enough to endure the rigorous work required of them and yet easily disassembled from the barrel for cleaning and sterilization.

More particularly stated, it is the object of my invention to provide a hypodermic syringe barrel and disassemblable fittings with a special provision in the construction of the barrel to establish strong mechanical connections between the fittings and the barrel.

Another object of my invention is to provide an improved connection between the needle and the barrel of a hypodermic syringe whereby to provide for leak-proof alignment of the parts without complicated construction and objectionable packings.

In the drawing:

Figure 1 is a side elevation of my improved hypodermic syringe with a portion of the barrel and a portion of the needle fitting assembly shown in vertical section.

Figure 2 is an isometric view of the handle disassembled from the barrel and showing each of the two parts of the handle separated from the other.

Figure 3 is an isometric view of the C clamp used in conjunction with a needle fitting embodying my invention.

Figure 4 is a vertical section through an alternative type of needle fitting.

Figure 5 is a section on line 5—5 of Figure 4.

Like parts are designated by the same reference characters throughout the several views.

The important members, structurally, in the hypodermic syringe in which my invention is incorporated, include a cylinder or barrel 10, a plunger 11 provided with a presser plate 12 and extending down into the barrel, and a needle 13.

At either end of the barrel I provide a restricted portion indicated at 14 at the upper end of the barrel to receive a handle 15 and at the outlet or lower end of the barrel at 16 to receive a needle clamp 17. At the extremities of the barrel I provide a head 18 against which the handle may abut and at 19 a head against which the needle clamp 17 may abut.

My improved handle is preferably embodied in two parts 20 and 21, each of which includes

outstanding finger grip portion 20' and 21' respectively and a substantially semi-cylindrical flange portion, 22 and 23 respectively. The portions 22 and 23 of the handle 15 encompass the restricted portion 14 of the barrel 10 and are provided with members to interlock with one another, as shown clearly in Figs. 1 and 2, where it will be seen that the portion 22 is provided with an outstanding ear 24 to be received in a slot 25 formed in the lower margin of the portion 23. The upper shoulders 26 of the handle portions 20 and 21 are provided with a configuration receivable under the head 18 of the barrel 10 so as to give a firm abutment for the entire handle 15 when the fingers of the user are hooked under the portions 20 and 21 and the palm of the hand of the user presses upon presser plate 12 to thrust the plunger 11 downwardly in the barrel. Under the stress of this manual operation, the ear 24 locked in slot 25 prevents the separation of the semi-cylindrical portions of the handle 15.

The other end of my hypodermic syringe may be conveniently termed the lower end. This end portion is reduced in diameter below the barrel cavity and provided with a central bore 31 in communication with the cavity below the plunger 11. Exteriorly this reduced portion is provided with an annular groove which forms a restricted neck 16, below which there is a terminal cylindrical head 19. A clamping or coupling member 17, having the general form of the body of a C clamp or yoke, is provided with forked arms 30 and 31 adapted to slidingly engage between them the neck portion 16 with the arms supported on the head 19. The coupling member 17 may therefore have a swiveling adjustment on the neck 16. The lower arm 32 of this yoke-shaped coupling member is suspended by the bow of the yoke underneath the barrel head 19 and has an aperture 33, threaded at 34 to receive a fitting or feed nut 35 and support it with its axis in line with the bore 37. The feed nut 35 has a longitudinally extending bore to receive the needle 13, and this needle has a head 36, the upper portion of which is spherically rounded and fitted to the spherically rounded recess 38, into which it is pressed when the feed nut 35 is turned upwardly in the coupling arm 32. The longitudinal bore of the needle extends through the head, thereby affording communication with the larger bore 37 in the lower end of the barrel. By unscrewing the feed nut sufficiently to allow a retraction of the needle head from the recess

38, the coupling 17 may be withdrawn to permit a removal and replacement or substitution of needles without loss of time.

In the alternative construction shown in Fig. 4, the barrel 10 of the syringe need not necessarily be restricted as at 16 in Fig. 1, but is provided with a head 40 against which a U-shaped bracket 41 may abut and the U-shaped bracket 41 is provided with a yoke 42 extending to a slip ring 43 into which a collar 44 is receivable. The collar 44 is apertured and threaded as indicated in Fig. 4 to receive a needle fitting 45 which is provided with a tapered recess 46 to receive a tapered outlet portion 47 of the barrel 10.

In the construction shown in Figs. 1 to 3 inclusive, the handle 15 separable into its two parts 20 and 21 and the C clamp 17 with its separable needle fitting 35 and needle 13 may be composed of materials suited to the extreme stresses to which they may be subjected and presumably they will be composed of metal or other substances of great tensile strength. They will likewise be composed of such materials as will withstand extreme heat so as to enable the user to sterilize them quickly. The barrel 10 will preferably be formed of glass or similar close grained material and will preferably be transparent to indicate the quantity of fluid which has been dispensed through the tube 37 and through the needle 13, and provision is therefore made for the separation of certain of the parts of the complete syringe to enable the user to more quickly and effectively accomplish complete sterilization without danger to the barrel 10.

In the handle 15 I have provided a construction which is quickly and easily assembled and disassembled. The two parts 20 and 21 with their semi-cylindrical flange portions 22 and 23 may be locked about the restricted portion 14 of the barrel 10 by interlocking the ears 24 in the slots 25 and the portions 22 and 23 may then be brought into position to embrace the restricted portion 14 and slidably brought in abutment against the barrel head 18.

Clamps and fittings for the assembly of the needle 13 upon the barrel 10 are readily placed in position by slidably placing the neck 16 of the barrel 10 between the embracing portions 30 and 31 whereby the clamp 17 is in abutment with the head 19 and, the needle fitting 35 having been previously retracted in its threaded engagement with the leg 32 of the clamp, the hemispherical end of the needle fitting 35 may be rotatably projected into the hemispherical recess 38 and clampingly engaged there in fluid tight relation to the barrel 10. Despite position misalignment of the C clamp 17 upon the barrel 10, the hemispherical tip 36 and the hemispherical recess 38 will allow for sufficient adjustment to maintain the fluid tight relationship desired.

In the alternative construction shown in Figs. 4 and 5 the comparative loose fitting of the U-shaped bracket 41 upon the barrel 10 and the comparative loose fitting of the collar 44 with the slip ring 43 permit of adjustment of the tapered tip 47 of the barrel 10 into the tapered recess 46 of the needle fitting 45 whereby to provide for fluid tight connection between the fitting 45 and the barrel 10 as the fitting is rotatably adjusted to the position, shown in Fig. 4.

I claim:

1. A hypodermic syringe comprising the combination of a barrel provided with reduced end portions, one having a central axial bore, an exterior annular groove and a cylindrical terminal

head below the groove, a plunger extending into the other end portion of the barrel, a coupling member having one arm forked and its fork arms engageable in said groove, said coupling member having a lower arm adapted to be supported by the fork arms underneath said head and provided with a threaded aperture, a tubular feed nut having threaded engagement in said aperture, and a needle extending through the feed nut and provided with a cylindrically rounded head engageable in the extremity of said bore, the barrel head being provided with a concavely rounded socket to receive the needle head, and the needle and its head being longitudinally apertured to provide communication with said bore and the interior of the barrel.

2. The combination with a hypodermic syringe barrel, of a needle supporting member in freely detachable swiveled coupling relation to said barrel, a feed nut carried by said needle supporting member with its axis in line with the barrel axis, and a headed hypodermic needle extending through the feed nut and adapted to be clamped thereby against the end of the barrel, said needle, needle head and barrel having longitudinally extending mutually registerable bores affording communication with the interior of the barrel.

3. The combination with a hypodermic syringe barrel, of a needle supporting member in freely detachable swiveled coupling relation to said barrel, a feed nut carried by said needle supporting member with its axis in line with the barrel axis, and a headed hypodermic needle extending through the feed nut and adapted to be clamped thereby against the end of the barrel, said needle, needle head and barrel having longitudinally extending mutually registerable bores affording communication with the interior of the barrel and the end of the barrel being provided with a spherically rounded socket into which the needle head fits when clamped in position against the end of the barrel.

4. In a hypodermic syringe, a coupling connection between the syringe nozzle and a headed tubular needle, comprising a coupling member having forked arms swiveled to the nozzle and provided with a needle receiving feed nut in axial alignment with the nozzle aperture, said feed nut being adapted to force the needle head against the end of the nozzle when adjusted in said coupling member in the direction of the nozzle.

5. The combination with a hypodermic syringe nozzle provided with an axial bore and an external annular groove near the nozzle extremity, a coupling member having fork arms adapted to slidably engage in said groove and to permit swiveling movements of the coupling member upon the nozzle head, an axially apertured feed nut carried by the coupling member in alignment with the axis of the nozzle and adapted to removably support a hypodermic needle in a position for end to end engagement with the nozzle, the ends of said nozzle and needle being contoured to form a tight joint when moved into engagement by the feed nut.

6. A hypodermic syringe comprising the combination of a barrel having reduced end portions, one of which is provided with spaced annular flanges and the other of which is provided with an annular groove, a separable handle comprising a set of finger pieces, each having a semi-cylindrical sleeve portion adapted to embrace the barrel between the annular flanges of the barrel, said sleeve portions having mutually interlock-

ing members adapted for manipulation into a position to hold the sleeve portions in engagement with the barrel during normal operation of the syringe, a coupling member having fork arms adapted to slidingly engage in said barrel groove, a headed hypodermic needle supported by the coupling member in alignment with the axis of the barrel, and a feed nut detachably engageable with the needle to hold the latter in joint-tight relation to the barrel, said barrel and needle being provided with registering bores.

RALPH A. KAUFFMAN.