

Feb. 18, 1958

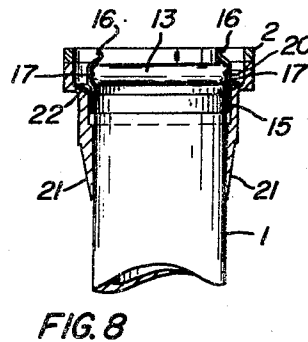
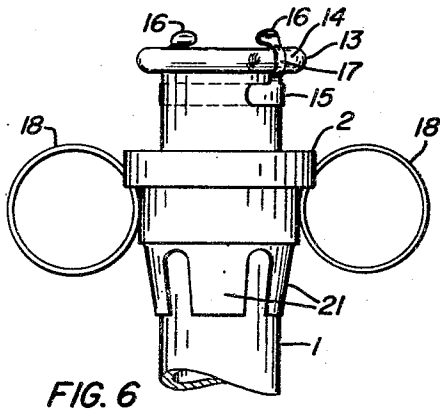
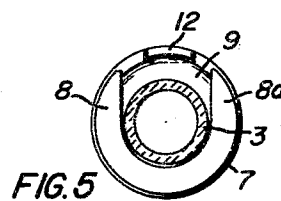
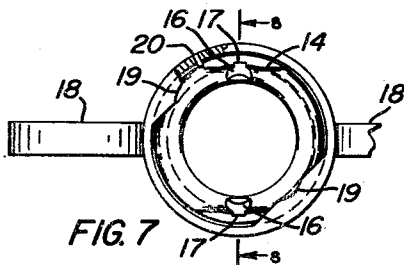
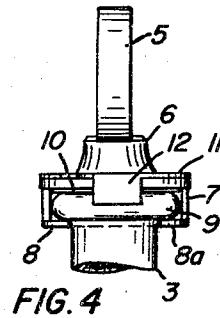
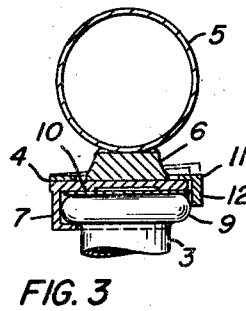
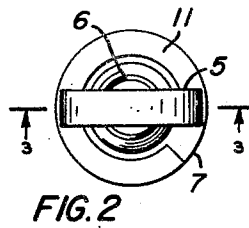
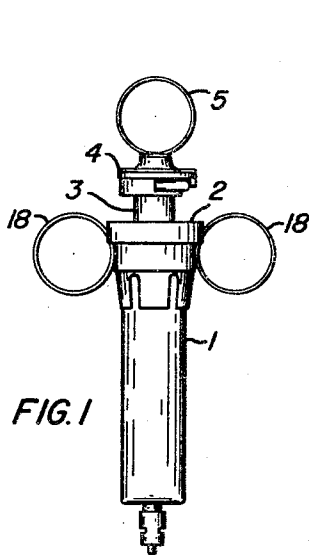
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2,823,675

HYPODERMIC SYRINGE ASSEMBLY

Filed Nov. 4, 1957

2 Sheets-Sheet 1



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2,823,675

HYPODERMIC SYRINGE ASSEMBLY

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2 Sheets-Sheet 2

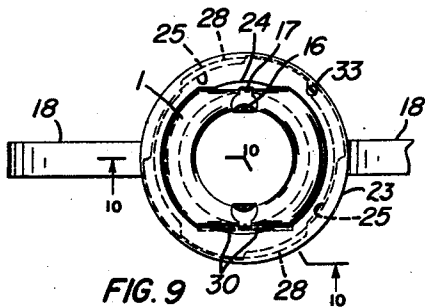


FIG. 9

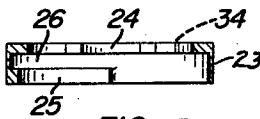


FIG. 13

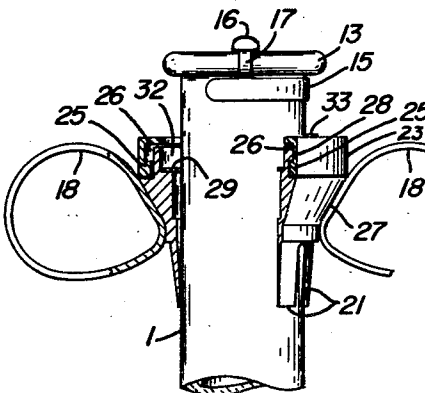


FIG. 10

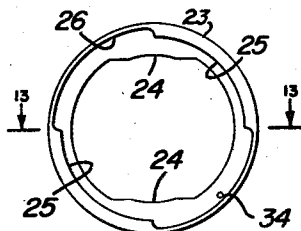


FIG. 12

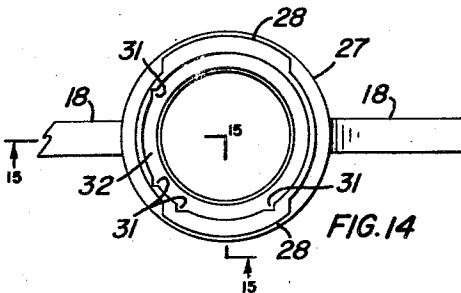


FIG. 14

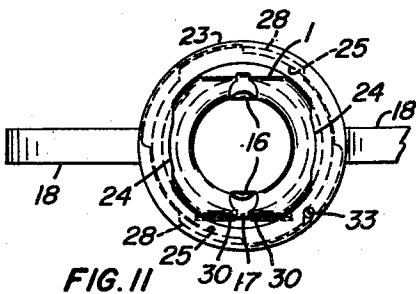


FIG. 11

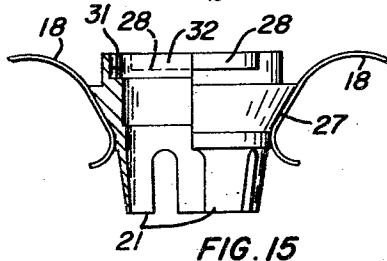


FIG. 15

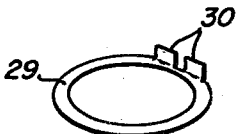


FIG. 16

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2,823,675

HYPODERMIC SYRINGE ASSEMBLY

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Application November 4, 1957, Serial No. 694,383

12 Claims. (Cl. 128—218)

This invention relates to an improvement in a hypodermic syringe, and its principal object is to provide means for quickly assembling and disassembling the major component parts of such a syringe without injury to the glass parts.

Another object is to provide in such a means positive locking features that will hold the parts firmly together after assembly and during use of the syringe.

Still another object is to permit more economical manufacture of hypodermic syringes made according to this invention.

Other objects will appear from the description which follows.

Heretofore, threaded members have been in general use in attaching finger grip supporting members to the barrel of a hypodermic syringe and to the top of the mating plunger. To avoid the necessary machining operations and facilitate the assembly of these parts has long been an objective in this field of manufacture. By my invention the use of interlocking parts eliminates the need for threaded connections and enables a more rapid assembly or interchange of parts.

Referring to the drawings in which the same reference number refers to the same or a similar part:

Figure 1 is an elevational view of a completely assembled hypodermic syringe embodying this invention.

Figure 2 is a top view of the plunger cap.

Figure 3 is a sectional view on line 3—3 of Figure 2, showing attachment of the cap to the top of the plunger.

Figure 4 is a side view of the top of the capped plunger.

Figure 5 is a bottom view of the capped plunger shown in Figure 4.

Figure 6 is a side elevational view of the upper portion of the syringe barrel prior to bringing the barrel cap into final position.

Figure 7 is a top view of the barrel partly in section showing the barrel cap in assembled position.

Figure 8 is a sectional view on line 8—8 of Figure 7.

Figures 9 to 16, inclusive, illustrate a modification of the barrel cap.

Figure 9 is a top view of a barrel partly in section, showing the modified barrel cap in unlocked position.

Figure 10 is a sectional view on line 10—10—10 of Figure 9.

Figure 11 is similar to Figure 9, but shows the barrel cap in locked position.

Figure 12 is a bottom view of only the barrel cap locking ring.

Figure 13 is a sectional view on line 13—13 of Figure 12.

Figure 14 is a top view of the barrel cap.

Figure 15 is a sectional view on line 15—15 of Figure 14.

Figure 16 is an isometric view of the seating ring.

The hypodermic syringe, as illustrated in Figure 1, is shown without the conventional needle attachment. As shown, it consists of the two conventional basic parts,

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namely, glass barrel 1 and glass plunger 3. Removably secured to the top of barrel 1 is metal barrel top 2, having a pair of finger accommodating rings 18. Removably assembled to the top of plunger 3 is metal plunger cap 4 surmounted by finger accommodating ring 5.

Plunger cap 4, as best shown in Figures 2 to 5, inclusive, has post 6 rising from the center of its upper surface and to which ring 5 is fixed. Atop the upper surface of cap 4 and surrounding the base of post 6 is a circular spring strip 11, fixed at one end to such upper surface and having at its free end a depending catch 12 free to move vertically in a slot in the edge of the upper surface.

Side wall 7 of cap 4 extends but half way around the cap on the side opposite catch 12. The bottom edge of side wall 7 turns inward to form a U-shaped opening having forked ends 8 and 8a separated by a width sufficient to pass the body of plunger 3 between them. The separation between the top surface of cap 4 and forks 8 and 8a is sufficient to accommodate flange 9 of plunger 3. Located between the top surface of flange 9 and the adjacent under surface of cap 4 is spring disc 10 which tends to hold these surfaces apart and to resist movement between them.

Reference to Figures 1 through 5 will indicate how plunger cap 4 is assembled to the flange of plunger 3. By lifting catch 12 against the resistance of spring strip 11 to the broken line position shown in Figure 3, clear passage is provided for the edgewise admission of flange 9 between the top surface of cap 4 and forks 8 and 8a. The distance between forks 8 and 8a will admit plunger 3 and after it has been brought against the resistance of disc 10 to the edge of the U-shaped opening, catch 12 will drop in place against the exposed edge of flange 9, firmly holding plunger cap 4 to the top of plunger 3.

Barrel 1 at the top is provided with flange 13 as may be best observed in Figure 6. Two parallel cuts in the periphery of flange 13 provide two parallel straight sides 14 in flange 13. Mounted immediately below flange 13 is locking piece 15 which partially encircles and clasps barrel 1. Projecting upward from locking pieces 15 are spring clips 17 terminating in curved tongues 16.

On opposite sides of barrel cap 2 are finger rings 18, preferably integral with cap 2. The lower portion of barrel cap 2 terminates in inwardly tapered fingers 21, adapted to bear against the outer surface of the body of barrel 1 in friction fit engagement.

The top of barrel cap 2 is adapted to receive and hold flange 13 within it. The top surface of barrel cap 2 is sized and shaped to admit flange 13 when in registry with it. Each straight side of the opening in the top surface of barrel cap 2 is indented with notch 19 which will accommodate inwardly pressed clip 17 when flange 13 is admitted to its seating within cap 2. Stop pin 20 may be incorporated in barrel cap 2 to limit the movement, in assembling, of flange 13 with respect to cap 2, by projecting into the path of clip 17.

Between the seating ledge of barrel cap 2 and the bottom of flange 13, resilient ring 22 is placed to serve as a cushion and spacer between them.

To assemble barrel cap 2 to barrel 1, locking piece 15 is first attached, as illustrated beneath flange 13. Resilient ring 22 is next seated in the top of cap 2. The lower end of barrel 1 is then inserted into the top opening of barrel cap 2 and lowered to the position shown in Figure 6. Flange 13 is then placed in registry with the top opening of cap 2 and passed therethrough, spring clips 17 being pressed inwardly as they pass through notches 19. After flange 13 is seated against the resistance of resilient ring 22, barrel 1 is twisted to the position shown in Figure 7 whereby the round portions of flange 13 are

brought under the overhang of the straight sides of the top opening of cap 2 is friction fit engagement therewith. Stop 20 will limit the twisting movement.

Barrel cap is removed by reversing the foregoing steps. Only when clips 17 are in registry with notches 19 may the barrel be removed and then against the spring catch resistance of clips 17.

The modifications in the barrel cap are shown in Figures 9 to 16, inclusive.

Certain parts remain unchanged, such as glass barrel 1 with flange 13 and its straight sides 14. Also unchanged is locking piece 15 with spring clips 17 and tongues 16.

The modified barrel top consists basically of two pieces, body 27 and locking ring 23. Body 27 has fingers 21 to grip barrel 1 and finger rings 18 preferably integral with it.

The circular top opening of body 27 has recess 32 to accommodate resilient ring 29, shown in Figure 16, and flange 13 of barrel 1. Ring 29 has upstanding tabs 30 and is prevented from moving circularly on its seat by a pair of slots 31 let into the inner wall of recess 32. A slot 31 provides a seat for the outer vertical edge of each tab 30.

Spaced flanges 28 on the outer surface of body 27 at its top edge cooperate with spaced flanges 25 inside of ring 23 at its bottom edge to afford means for slidably engaging ring 23 to body 27. Figures 14 and 15 illustrate body 27 without ring 23.

Referring to Figures 12 and 13, ring 23 is shown by itself. The top opening of ring 23 has straight sides with notches 24 to permit flange 13 and clips 17 to pass. Undercut 26 provides a track for flanges 28 of body 27.

The modified barrel cap once assembled is not thereafter disassembled in order to be mounted on a barrel. It contains in recess 32, ring 29 fixed by the location of tabs 30 between a pair of slots 31, and is surmounted by partially rotatable ring 23. Ring 23, once it has been engaged with body 27 is prevented from accidental disengagement by stop screw 33 threaded into opening 34, located midway between adjacent flanges 25. Thus, the movement of ring 23 relative to body 27 is limited to the arc between flanges 25.

To assemble the modified barrel cap to barrel 1, ring 23 is rotated to place a notch 24 in registry with the opening between tabs 30 of ring 29. Next, barrel 1 is lowered into the opening of ring 23 until it is seated on ring 29 and a clip 17 is lodged between tabs 30. Turning ring 23 will cause it to firmly grip flange 13.

It will be noted that with the modified barrel cap the barrel remains fixed and the rotation of ring 23 secures the barrel to the cap. In the first illustration given herein, it is the barrel that is rotated to place it in secured position.

Many modifications may be made in the construction shown and described, and it is not intended by such descriptions to limit the scope of this invention.

What I claim is:

1. In a hypodermic syringe finger grip mounting means consisting of a plunger and cap assembly comprising a cylindrical plunger having an encircling flange at one end; a cap having a circular top coextensive with the flanged end of the plunger; a curved side wall depending from the circular top for a portion of its periphery not in excess of 180 degrees with its inner surface in contact with the outer edge of the plunger flange; a bottom member extending from the curved side wall parallel with the circular top and embracing a portion of the plunger flange therebetween; a spring catch on the circular top engaged with the plunger flange; and a finger grip mounted atop the circular top; and a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a cut-away section in such flange; a band partially encircling the barrel beneath the flange;

an upstanding flexible member attached to such band curved about the cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; finger members extending downward from the collar in friction fit engagement with the barrel; and an inwardly turned edge on top of the collar forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having a notch therein adapted to accommodate passage of the upstanding flexible member; and a pair of finger grips extending from the collar on opposite sides thereof.

2. In a hypodermic syringe, a plunger and cap assembly comprising a cylindrical plunger having an encircling flange at one end; a cap having a circular top coextensive with the flanged end of the plunger; a curved side wall depending from the circular top for a portion of its periphery not in excess of 180 degrees with its inner surface in contact with the outer edge of the plunger flange; a bottom member extending from the curved side wall parallel with the circular top and embracing a portion of the plunger flange therebetween; a spring catch on the circular top engaged with the plunger flange; and a finger grip mounted atop the circular top.

3. In a hypodermic syringe, a plunger and cap assembly comprising a cylindrical plunger having an encircling flange at one end; a cap having a circular top coextensive with the flanged end of the plunger; a curved side wall depending from the circular top for a portion of its periphery not in excess of 180 degrees with its inner surface in contact with the outer edge of the plunger flange; a U-shaped bottom member extending from the curved side wall parallel with the circular top and embracing a portion of the plunger flange therebetween; a spring catch on the circular top engaged with the plunger flange; and a finger grip mounted atop the circular top.

4. In a hypodermic syringe, a plunger and cap assembly comprising a cylindrical plunger having an encircling flange at one end; a cap having a circular top coextensive with the flanged end of the plunger; a resilient member disposed between the end of the plunger and the underside of the circular top; a curved side wall depending from the circular top for a portion of its periphery not in excess of 180 degrees with its inner surface in contact with the outer edge of the plunger flange; a U-shaped bottom member extending from the curved side wall parallel with the circular top and embracing a portion of the plunger flange therebetween; a spring catch on the circular top engaged with the plunger flange edge opposite the embraced portion of the flange; and a finger grip mounted atop the circular top.

5. In a hypodermic syringe; a plunger and cap assembly comprising a cylindrical plunger having an encircling flange at one end; a cap having a circular top coextensive with the flanged end of the plunger; a resilient disc disposed between the end of the plunger and the underside of the circular top; a curved side wall depending from the circular top for a portion of its periphery not in excess of 180 degrees with its inner surface in contact with the outer edge of the plunger flange; a U-shaped bottom member extending from the curved side wall parallel with the circular top and embracing a portion of the plunger flange therebetween; a spring catch on the circular top engaged with the plunger flange edge opposite the embraced portion of the flange; and a finger grip mounted atop the circular top.

6. In a hypodermic syringe, a plunger and cap assembly comprising a cylindrical plunger having an encircling flange at one end; a cap having a circular top coextensive with the flanged end of the plunger; a resilient disc disposed between the end of the plunger and the underside of the circular top; a curved side wall depending from the circular top for a portion of its periphery not in excess of 180 degrees with its inner surface

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in contact with the outer edge of the plunger flange; a U-shaped bottom member extending from the curved side wall parallel with the circular top and embracing a portion of the plunger flange therebetween; a flexible circular strip on the circular top, secured at one end thereto and at the other end having a dependent portion beyond the edge of the top and engaged with the plunger flange; and a finger grip mounted atop the circular top.

7. In a hypodermic syringe a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a cut-away section in such flange; a band partially encircling the barrel beneath the flange; an upstanding flexible member attached to such band curved about the cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; a pair of finger grips extending from the collar on opposite sides thereof; finger members extending downward from the collar in friction fit engagement with the barrel; and an inwardly turned edge on top of the collar forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having a notch therein adapted to accommodate passage of the upstanding flexible member.

8. In a hypodermic syringe a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a cut-away section in such flange; a band partially encircling the barrel beneath the flange; an upstanding flexible member attached to such band curved about the cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; a pair of finger grips extending from the collar on opposite sides thereof; finger members extending downward from the collar in friction fit engagement with the barrel; an inwardly turned edge on top of the collar forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having a notch therein adapted to accommodate passage of the upstanding flexible member; and a resilient ring positioned between the inner surface of the collar and the bottom edge of the flange.

9. In a hypodermic syringe a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a pair of cut-away sections in such flange; a band partially encircling the barrel beneath the flange; a pair of upstanding flexible members attached to such band each being curved about a cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; a pair of finger grips extending from the collar on opposite sides thereof; finger members extending downward from the collar in friction fit engagement with the barrel; an inwardly turned edge on top of the collar forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having notches therein adapted to accommodate passage of the upstanding flexible members, and a resilient ring positioned between the inner surface of the collar and the bottom edge of the flange.

10. In a hypodermic syringe a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a pair of cut-away

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sections in such flange; a band partially encircling the barrel beneath the flange; a pair of upstanding flexible members attached to such band, each being curved about a cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; a pair of finger grips extending from the collar on opposite sides thereof; finger members extending downward from the collar in friction fit engagement with the barrel; an inwardly turned edge on top of the collar forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having notches therein adapted to accommodate passage of the upstanding flexible members; a resilient ring positioned between the inner surface of the collar and the bottom edge of the flange; and a stop inward of the collar adapted to limit rotary movement of the barrel with respect thereto.

11. In a hypodermic syringe a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a cut-away section in such flange; a band partially encircling the barrel beneath the flange; an upstanding flexible member attached to such band curved about the cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; a pair of finger grips extending from the collar on opposite sides thereof; finger members extending downward from the collar in friction fit engagement with the barrel; an interrupted flange on the external surface of the collar adjacent its top; a ring with an interrupted internal flange adapted to engage with the flange of the collar; an inwardly turned edge on top of the ring forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having a notch therein adapted to accommodate passage of the upstanding flexible member.

12. In a hypodermic syringe a barrel and barrel cap assembly comprising a cylindrical barrel having an external flange encircling its open top; a pair of cut-away sections in such flange; a band partially encircling the barrel beneath the flange; a pair of upstanding flexible members attached to such band, each being curved about a cut-away edge of the flange a spaced distance therefrom; a cap member having a collar encompassing the barrel, band and flange; a pair of finger grips extending from the collar on opposite sides thereof; finger members extending downward from the collar in friction fit engagement with the barrel; an interrupted flange on the external surface of the collar adjacent its top; a ring with an interrupted internal flange adapted to engage with the flange of the collar; an inwardly turned edge on top of the ring forming an opening coaxial with the barrel and substantially identical with the periphery of the flange and having notches therein adapted to accommodate passage of the upstanding flexible members; and a resilient ring positioned between the inner surface of the collar and the bottom edge of the flange.

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