

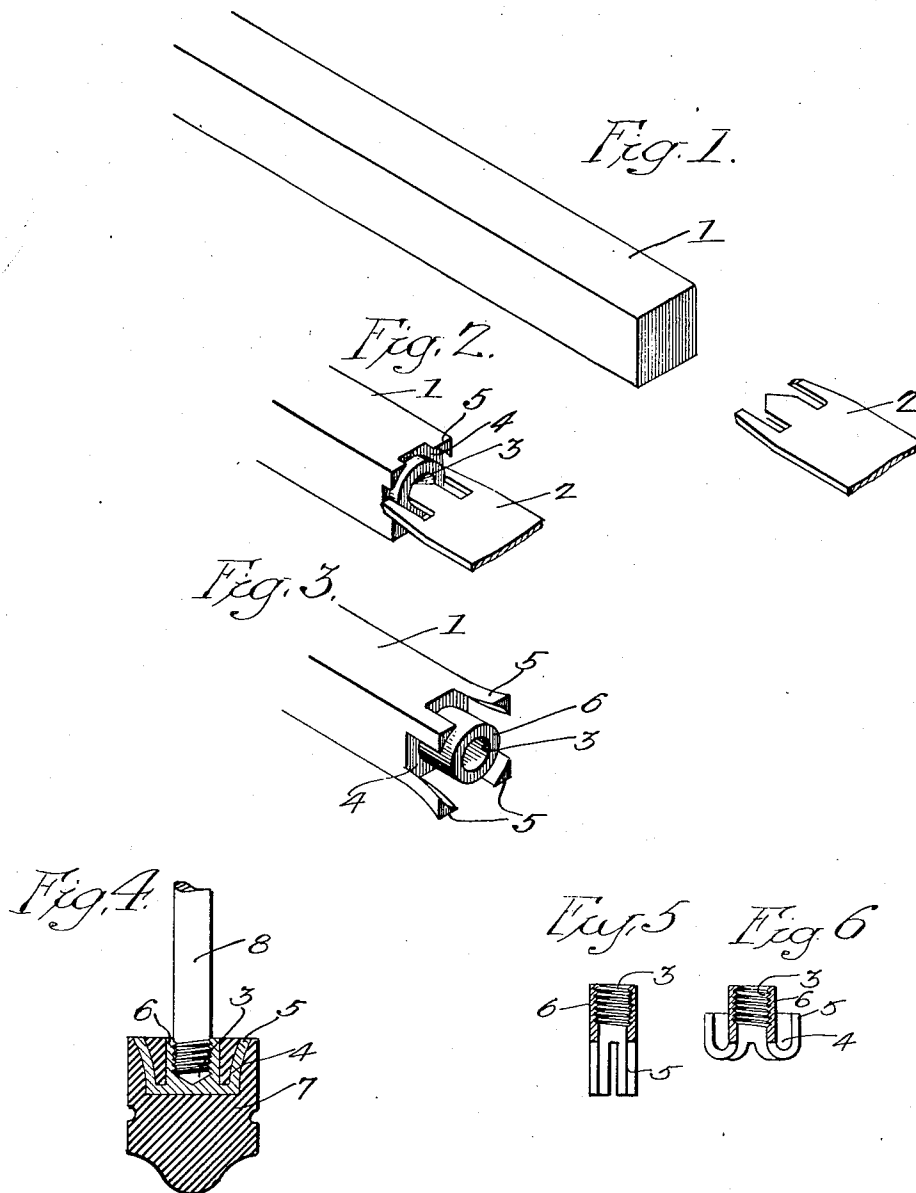
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PLUNGER FOR HYPODERMIC SYRINGES AND THE LIKE

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PLUNGER FOR HYPODERMIC SYRINGES
AND THE LIKE

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1 Claim. (Cl. 128—218)

This invention relates primarily to improvements in hypodermic syringes and more particularly to improvements in the rubber plungers which constitute a standard part of such devices.

5 In hypodermic syringes it is frequently desirable to retract as well as advance the plunger in the syringe cylinder, and for this purpose the plungers, commonly of flexible rubber, are equipped with inserted sockets threaded or
10 otherwise formed for interlocking connection with a stem by means of which the plunger may be actuated. Considerable difficulty has been experienced in obtaining an efficient bond between the rubber of the plunger and the socket
15 element, and particularly in the retracting of the plunger, the socket elements have been subject to breaking away from the rubber plunger, thereby rendering the syringe inoperative. The difficulty is increased by the fact that frequently
20 the plungers stick in the barrel and can be released only by rotating the plunger, a movement which tends to tear the socket loose from the rubber. Another influencing factor resides
25 with serum or other substance is usually subjected to a sterilizing operation at a relatively high temperature, this heat effecting chemical changes tending to separate the rubber from the socket element and tending also to cause the
30 rubber plunger to adhere to the sides of the cylinder.

It is an object of this invention to provide an improved plunger having a stem-receiving socket so formed and embedded in the plunger as to
35 effectively resist the tendency of all normal strains and stresses to loosen the socket from the surrounding rubber, and thereby to provide a plunger that may be freely advanced or retracted or rotated in the cylinder without danger
40 of separation of the socket member and consequent destruction of the syringe.

The invention resides not only in the plunger as a whole but in the specific form and method of manufacture of the socket insert, as hereinafter
45 set forth.

In the attached drawing:

Figure 1 is a view in perspective of a fragment of stock material from which in a preferred procedure the socket member is manufactured, and
50 also shows a portion of one form of tool that may be employed;

Fig. 2 is a view in perspective illustrating the initial step in the manufacture of the socket
55 member;

Fig. 3 is a view in perspective illustrating a further step in the process of manufacture;

Fig. 4 shows a sectional view of the finished plunger, and

Figs. 5 and 6 are sectional views illustrating a
60 modification within the scope of the invention.

In the production of a socket member in accordance with my invention, I prefer to employ a blank in the form of a rod 1 of square cross section which may be of brass or other suitable
65 material. In an initial operation, I may employ a rotary boring tool, as indicated at 2 in Figs. 1 and 2, which is adapted to simultaneously form in the end of the blank 1 a central longitudinal cylindrical recess 3 and an outer concentric an-
70 nular recess 4, the latter intersecting the side surfaces of the blank to form spaced ears or projections 5. Preferably and as illustrated, the portions of the cutter 2 which form the recess 4 are flared or beveled outwardly above the cutting
75 edge whereby as the cutter advances in the cutting operation the ears or projections 5 are bent outwardly away from the central cylindrical part 6, as clearly illustrated. Following the drill-
80 ing or boring operation as set forth above, the socket element is completed by internally threading or tapping the central cylindrical opening 3 and by cutting away the machined extremity of the blank 1 to obtain an element substantially as
85 illustrated in Fig. 4. The socket member thus produced is introduced into the mold in which the rubber plunger 7 is formed and is molded into the plunger in well known manner, the finished article being shown in Fig. 4.

A socket-member of the form illustrated and
90 described above has been found admirably suited for the purpose. The base portion of the member, projecting from the sides of the central socketed part 6, establishes relatively extended rubber-abutted surfaces which are normal to the
95 thrusts or strains exerted through the stem 8 in either advancing or retracting the plunger in the barrel of the syringe and are capable of withstanding the forces tending toward separation
100 of the socket member from the rubber. In the retraction movement the tongues 5 also assist in anchoring the socket member, and these elements also directly oppose any tendency of the socket-member to tear loose from the rubber when the
105 plunger, through the stem 8 is rotated in the barrel. This function of the tongues 5 is aided by the flared formation previously described.

It will be noted that but three operations are required for producing the socket member in the procedure outlined above, and while a socket-
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member embodying the substantially same desirable characteristics may be produced by other methods, the one herein described commends itself for its simplicity and relative cheapness. It has also been found that with a tool of the general character illustrated, the longitudinal edges of the tongues 5 are rough and uneven which aids in creating a firm bond between these elements and the rubber of the plunger.

10 In Figures 5 and 6, I disclose a socket-member formed of metal tubing. In this instance a blank tube is internally threaded at one end and at the other end is divided longitudinally by cross-cuts to form four sections which are then bent outwardly and back to form elements corresponding to the tongues 5 of the previously described embodiment. The corresponding parts of

the two embodiments are identified by the same reference numerals.

I claim:

A plunger for hypodermic syringes comprising a cylindrical body portion, and an integral socket member embedded in said body portion, said socket member comprising a base and a central socket for the reception of an actuating stem, a substantially rectangular flange on the socket member projecting from the base in the plane thereof, and an element at each corner of said flange extending laterally therefrom along the socket portion substantially parallel therewith and spaced therefrom whereby rotational, lateral and axial movements of the socket member within the body portion are prevented.

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