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H. O. WEST

1,961,023

PLUNGER FOR HYPODERMIC SYRINGES

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Fig. 1.

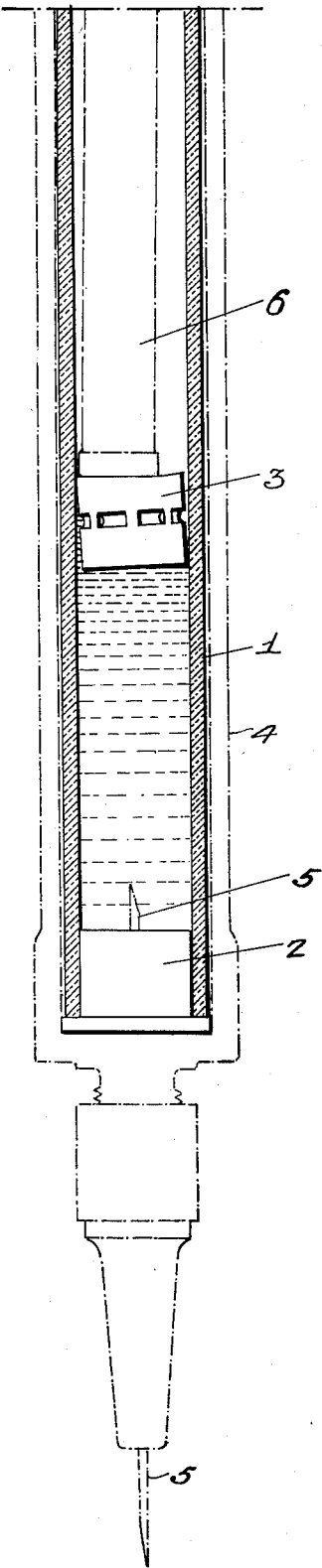


Fig. 2.

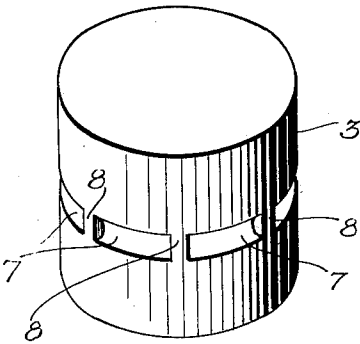
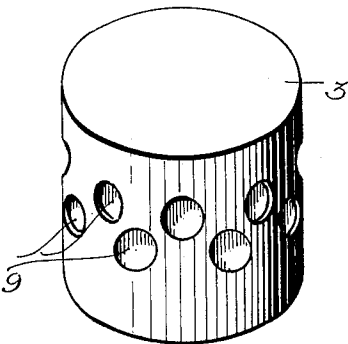


Fig. 3.



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PLUNGER FOR HYPODERMIC SYRINGES

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5 Claims. (Cl. 128—218)

This invention relates to improvements in rubber plungers of the type employed in hypodermic syringes. To facilitate movement of these plungers in their cylinders, it has been proposed to incorporate a lubricant such as paraffin in the rubber composition, and it is common practice for the same purpose to provide the plungers with circumferential grooves for reception of a lubricating medium such as glycerine. When pressure is applied to plungers of this class, and particularly those having an incorporated lubricant, there frequently occurs a leakage of the liquid contents of the cylinder past the sides of the plunger, and I have discovered that this leakage is due to a cocking or angular displacement of the plunger in the cylinder and a resultant bypassing of the liquid through the aforesaid circumferential groove to the rear of the plunger.

The principal object of the present invention is to provide a plunger of the stated character which while having the desirable lubricating features shall be constructed as to prevent bypassing of the liquid past the plunger in the manner previously described.

In the attached drawing:

Figure 1 is a fragmentary sectional view of a cylindrical container adapted for use in a certain type of hypodermic syringe, a portion of the latter being shown in broken lines;

Fig. 2 is a view in perspective of a plunger made in accordance with my invention; and

Fig. 3 is a view in perspective of a modified form of plunger within the scope of my invention.

With reference to the drawing, 1 is a glass or other cylinder forming the body of the container. One end of this cylinder is closed by a rubber stopper 2, and in the opposite end is a plunger 3 adapted to slide in the cylinder to expel the liquid contents normally confined between the stopper 2 and the plunger 3. Containers of this type are adapted for use with hypodermic syringes comprising a casing or body portion 4 adapted to receive the container 1, and a double-ended needle 5 the inner end of which projects into the chamber of the casing 4, so that when the container 1 is inserted this end of the needle penetrates the stopper 2. At the opposite end of the casing 4 is slidably mounted a plunger rod 6 through which pressure may be applied to the outer face of the plunger 3, as illustrated, to force the plunger toward the stopper 2, and to thereby eject the contents of the container through the needle 5. In this type of syringe, the plunger rod 6, by reason of its relatively loose mounting, is subject to displacement with respect to the axis of the container 1, and may thus come to bear against the plunger 3 adjacent the edge of the latter as illustrated. Under these conditions there is a tendency for

the plunger to become displaced angularly in the cylinder as illustrated, and when the plunger is provided with a continuous circumferential groove, this groove forms a bypass channel through which the liquid contents of the container 1 are permitted to escape. This tendency to angular displacement of the plunger is particularly pronounced in plungers having an incorporated lubricant such as paraffin, as previously set forth.

In accordance with my invention, I may provide the plunger 3 in lieu of the continuous circumferential groove with an interrupted circumferential groove, such for example as illustrated at 7 in Figs. 1 and 2. The sections of this interrupted groove are separated by webs 8, the outer faces of which preferably lie flush with the cylindrical surface of the plunger. This interrupted groove provides the desirable recess for reception of the lubricant, but effectively prevents bypassing of the liquid contents of the container with which it is associated.

It is apparent that my invention in principle may find various embodiments, such for example as that illustrated in Fig. 3, wherein the cylindrical surface of the plunger is provided with a plurality of pits or recesses 9 arranged in one or more series extending around the circumference of the plunger. These recesses constitute pockets for the lubricant, which is desirable, but avoids the undesirable feature of the continuous circumferential recess, which as previously set forth is responsible under certain conditions for the escape of the contents of the syringe.

There may be other modifications without departure from the invention.

I claim:

1. A plunger of the type set forth consisting of a resilient substantially cylindrical body having in the side a plurality of recesses extending in a disconnected series around the circumference of the plunger.

2. A plunger of the type set forth consisting of a resilient substantially cylindrical body having in the side a plurality of circumferentially spaced recesses.

3. A plunger of the type set forth consisting of a resilient substantially cylindrical body of rubber having in the side thereof a plurality of circumferentially spaced recesses.

4. A flexible cylindrical plunger of the type set forth having in the side thereof a plurality of lubricant receiving circumferentially spaced recesses.

5. A plunger of the type set forth consisting of a resilient substantially cylindrical body of a rubber composition containing a lubricating constituent, said body having in the side thereof a plurality of circumferentially spaced recesses.

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