H. LAURENT.

SYRINGE.

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Fig. 1.

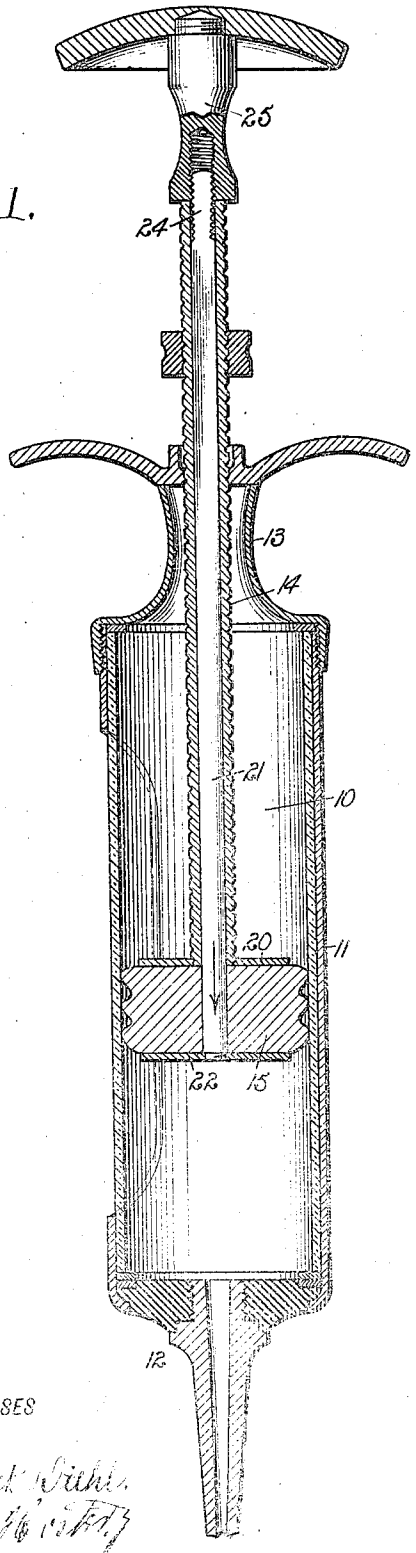
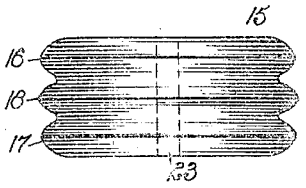


Fig. 2.



WITNESSES

Frederick Dieh.
Geo. F. Dieh Jr.

INVENTOR
Henry Laurent
BY Munn & Co
ATTORNEYS

UNITED STATES PATENT OFFICE.

HENRY LAURENT, OF EAST RUTHERFORD, NEW JERSEY, ASSIGNOR TO BECTON, DICKINSON & CO., OF RUTHERFORD, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SYRINGE.

1,222,424. Specification of Letters Patent. Patented Apr. 10, 1917.

Application filed December 9, 1916. Serial No. 135,920.

To all whom it may concern:

Be it known that I, HENRY LAURENT, a citizen of the United States, and a resident of East Rutherford, in the county of Bergen and State of New Jersey, have invented a new and Improved Syringe, of which the following is a full, clear, and exact description.

The invention relates to syringes having a rubber plunger reciprocating in a glass barrel and the object is to provide a new and improved syringe arranged to prevent the rubber plunger head from sticking to the inner surface of the barrel on reciprocating the plunger even if the syringe has not been used for some time.

Another object is to insure proper fitting of the plunger head in the barrel even should the bore thereof not be true.

Another object is to permit the user to easily reciprocate the plunger and without danger of the liquid in the front end of the barrel leaking past the plunger head to the rear end of the barrel.

In order to accomplish the desired result, use is made of a plunger having a head made of a single piece of flexible and compressible material, such as soft rubber, the head being provided with integral circumferential ridges spaced apart on the peripheral face of the plunger head, the ridges being under compression in the barrel and each ridge having tapering sides terminating in an annular edge common to both sides to cause each ridge to flex in the opposite direction in which the plunger travels at the time in the barrel.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal central section of the improved syringe; and

Fig. 2 is an enlarged side elevation of the plunger head.

In syringes provided with a glass barrel and a rubber piston or a plunger head as heretofore constructed, considerable difficulty has been experienced in insuring proper working of the syringe on account of the rubber sticking to the glass barrel. This condition is greatly aggravated if a syringe has not been in use for some time. It is well known that under such conditions, the rubber firmly sticks to the glass and it is necessary for the user to employ considerable force to start the plunger, but usually some of the rubber particles adhere to the glass surface and thus injure the plunger head and render the syringe defective. In syringes using a glass barrel, the interior diameter thereof is sometimes not true and hence the ordinary piston head does not properly fit and leakage is had from the forward end of the barrel to the rear end thereof in forcing a liquid out of the barrel. To overcome the above mentioned defects and to insure a proper working of the syringe at all times is the object of the invention presently described in detail.

The glass barrel 10 of the syringe is mounted in a suitable metallic casing 11 provided at its forward end with a nozzle 12 and at its rear end with a head 13 in which is mounted to slide the plunger rod 14 provided with a plunger head 15 arranged within the barrel 10. The plunger head 15 is made of soft rubber or a similar flexible and compressible material and the peripheral face of the plunger head 15 is provided with integral ridges 16, 17, and 18, of which the ridges 16 and 17 are circumferentially arranged at the ends of the plunger head 15, while the ridge 18 is arranged circumferentially intermediate the ridges 16 and 17. Each of the ridges 16, 17, and 18 is approximately A-shaped in cross section, that is, each ridge has two beveled sides terminating in an annular edge common to both sides. The diameters of the ridges 16, 17, and 18 are alike and are somewhat in excess of the inner diameter of the glass barrel 10 in which the plunger head is to be used, so that when the plunger head is placed in position in the barrel 10, then the ridges 16, 17, and 18 are put under compression. For ordinary syringes the plunger head 15 is attached to an ordinary plunger rod, but the plunger head 15 may be used in conjunction with expansible means, such as shown in Fig. 1, which expansible means, however, do not form any part of my present invention. As shown, the plunger rod 14 is made hollow and terminates at its inner end in a washer 20 and through the plunger rod 14 extends a rod 21 provided at its inner end with a washer 22. The plunger head 15 is provided with a central opening 23, through which extends the inner portion of the rod

21, so that the ends of the plunger head 15 are engaged by the washers 20 and 22. On the outer threaded end 24 of the rod 21, screws a nut 25 abutting against the outer end of the rod 14 to permit of drawing the rod 21 outwardly relative to the rod 14, thus compressing the piston head 15 between the plungers 20 and 22. By compressing the plunger as described, the ridges 16, 17, and 18 are still further compressed to insure a correspondingly tight fit in the barrel 10.

It will be noticed that when the plunger head 15 is reciprocated in the barrel 10, then the A-shaped ridges 16, 17, and 18 flex in the direction opposite to the travel of the plunger head in the barrel 10. Thus when the plunger 15 is moved outwardly in the direction of the arrow shown in Fig. 1, then the ridges 16, 17, and 18 flex in a rearward direction, thus allowing the plunger head to move easily within the barrel 10, at the same time preventing leakage of the liquid in the front end of the barrel past the plunger head 15 to the rear end of the barrel 10. It will also be noticed that by the arrangement described, the plunger head 15, owing to the compressed ridges 16, 17, and 18, permits the ridges to expand in case the interior diameter of the glass barrel 10 is not true throughout the length of the barrel. In case the syringe has not been used for some time, the ridges 16, 17, and 18 are not liable to stick to the inner surface of the glass barrel and hence the plunger rod can be readily started whenever it is desired to use the syringe.

The improved piston or plunger head shown in the drawings and above described is of the expansible type by the use of the double plunger rod, but it is expressly understood that I do not limit myself to this type of plunger nor to the particular type of the syringe shown, as my invention is equally well applicable to other types of syringes and to ordinary non-expansible plunger rods.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a syringe, a barrel and a plunger adapted to reciprocate in the barrel, the plunger having a head made of a single piece of flexible and compressible material, the head being provided with integral circumferential ridges spaced apart on the peripheral face of the plunger head, the ridges being under compression in the barrel and each ridge having like tapering sides terminating in an annular edge common to both sides to cause each ridge to flex in the opposite direction in which the plunger travels at the time in the barrel.

2. In a syringe, a glass barrel and a plunger adapted to reciprocate in the said barrel, the plunger having a head made of a single piece of soft rubber, the head being provided with integral circumferential ridges of which two are located at the ends of the head and one is arranged intermediate the said end ridges, the ridges being under compression in the barrel and being approximately A-shaped in cross section to cause the ridges to flex in the opposite direction in which the plunger travels at the time in the barrel.

3. As an article of manufacture, a plunger head made of a single piece of soft rubber and provided on its peripheral face with spaced integral circumferential ridges, each approximately A-shaped in cross section to allow the ridges to flex in opposite directions in lines parallel to the axis of the plunger head.

HENRY LAURENT.