

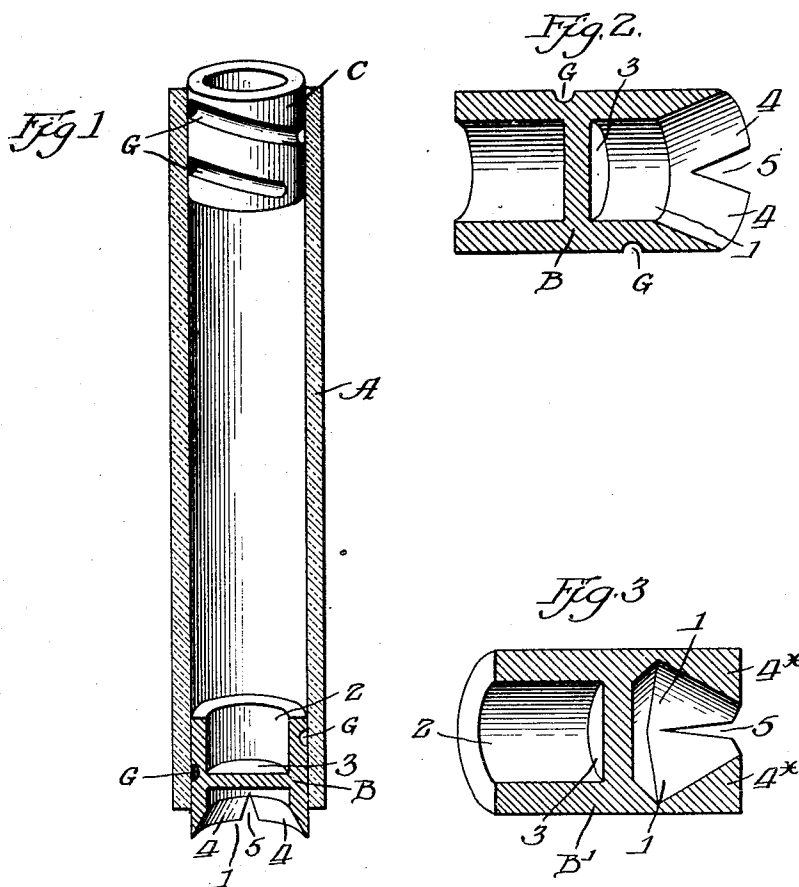
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SYRINGE CARTRIDGE

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UNITED STATES PATENT OFFICE

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SYRINGE CARTRIDGE

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This invention relates to cartridges for hypodermic syringes.

A cartridge of the kind referred to usually consists of a glass tube sealed by rubber stoppers which confine a charge of hypodermic fluid between them. When used in a syringe instrument for administering a hypodermic injection, the front cartridge stopper is pierced by the inner end of the syringe needle or a canula in communication therewith, and the syringe plunger drives the rear stopper into or through the cartridge tube for forcibly ejecting the fluid contents through the needle. In this action the pressure applied through the plunger thrusts the cartridge forward against the front head of the syringe barrel. It is desirable to protect the front end of the glass tube from breakage by interposing a suitable cushioning means between the tube and the front head of the syringe barrel. Expedients for this purpose have heretofore been employed. The present invention, however, provides for sealing, cushioning and protecting the front end of the cartridge tube in a novel way. For this purpose the front cartridge stopper is constructed with a notched tubular end protruding beyond the end of the glass tube and adapted to be bent thereover when the cartridge is subjected to the operating pressure in a syringe instrument.

For illustration, reference is made to the accompanying drawings in which:

Fig. 1 is a longitudinal sectional view of a cartridge embodying the invention.

Fig. 2 is a sectional view of the pierceable front stopper of said cartridge.

Fig. 3 is a similar view of another form of front stopper.

In the drawings, A denotes the cartridge tube, B the pierceable front stopper, and C the rear stopper or plunger plug which is to be forced into the tube by the syringe plunger to expel the fluid contents of the cartridge through the needle or canula that pierces the stopper B.

The pierceable front stopper B is shown as a tubular body with an intermediate diaphragm 3 to be pierced by the needle or canula. By this construction the stopper

is provided with an inwardly facing recess 2 as well as with the outwardly facing recess 1, consequently in the fluid-ejecting operation the annular wall of the stopper surrounding the recess 2 is subjected to hydrostatic pressure, tending to tighten the hold of the stopper in the tube and promoting its sealing effect.

The tubular outer portion of said stopper, which protrudes beyond the end of the cartridge tube, is formed with a tapered edge at 4, and with diametrically opposite notches one of which is indicated at 5. When the cartridge is forced forward in the ejection administering operation, the protruding notched end of the stopper B bearing against the front head of the syringe barrel will spread outwardly so as to overlie the end of the cartridge tube, protecting the same against breakage and preventing leakage. This is allowed by the fact that the notches 5 open up more and more as the pressure upon the cartridge increases.

The modified form of pierceable stopper B1, shown in Fig. 3, has its outer tubular notched portion so interiorly formed so as to provide undercut portions 4x. If this stopper be used in the cartridge with the recess 2 facing inwardly and the tubular notched portion protruding beyond the end of the cartridge tube, then when the cartridge is forced forward there will be an outward displacement of the portions 4x so as to spread over the end of the tube.

As indicated at G in Fig. 1, the plunger stopper may be provided with a spiral groove instead of the ordinary annular groove.

What I claim as new and wish to secure by Letters Patent is:

1. A syringe cartridge comprising a sealed liquid containing tube embodying a stopper to be pierced by a needle or canula fitted in the fore end of the tube, the cartridge being constructed to have its interior volume reduced for ejecting the liquid through the needle, said stopper having a notched tubular protrusion beyond the fore end of the tube adapted to be bent over the end of the tube to cushion the same when

the cartridge is employed in a syringe instrument.

2. A syringe cartridge comprising a liquid containing tube having stoppers, one adapted to be forced inward to eject the liquid through a needle or canula thrust through the opposite stopper, and the last mentioned stopper having a notched tubular portion protruding beyond the end of the tube and adapted to be bent over the end of the tube so as to cushion the same when the cartridge is employed in a syringe instrument.

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