

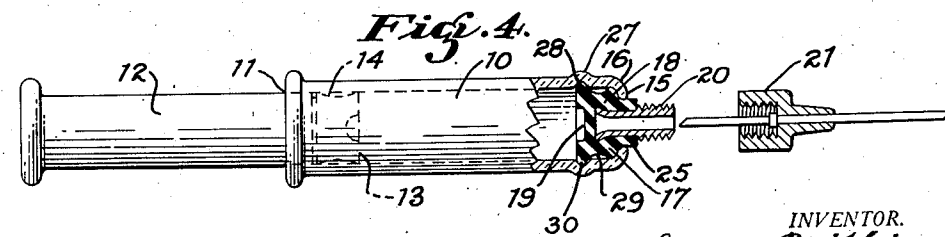
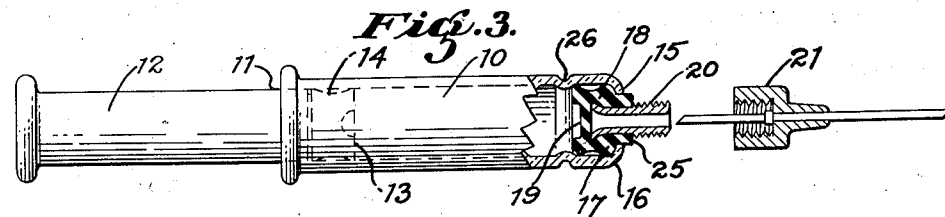
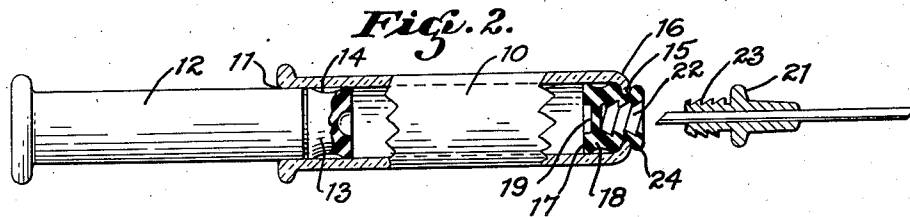
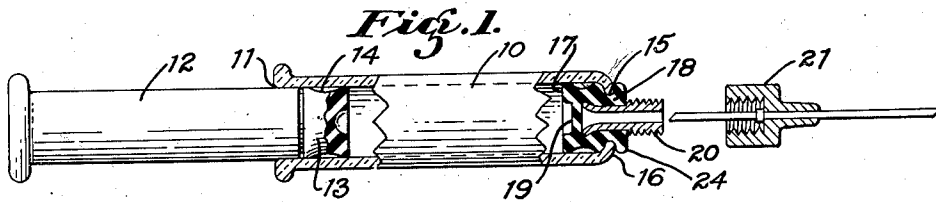
Dec. 21, 1937.

G. N. HEIN

2,102,704

SYRINGE CARTRIDGE

Filed June 10, 1935



INVENTOR.  
*George N. Hein*  
BY *Wm. J. Toland*  
ATTORNEY.

# UNITED STATES PATENT OFFICE

2,102,704

## SYRINGE CARTRIDGE

George N. Hein, San Francisco, Calif.

Application June 10, 1935, Serial No. 25,791

3 Claims. (Cl. 128—218)

This invention relates to a syringe cartridge and more particularly to an improvement in the construction of a syringe cartridge of the type in which liquids such as medicaments may be prepared in sealed form in a cartridge and an injection needle attached directly to the cartridge by puncture of a resilient closure member thereof.

Among the objects of the invention are to provide a syringe cartridge having a closure member adapted to seat within the discharge end of a vial body and so constructed as to be self-retaining within the vial body.

Another object is to provide in a syringe cartridge a combined closure member and supporting member for an injection needle.

Another object is to provide an end closure member for a syringe cartridge having means for supporting the base or hub of an injection needle and which provides a resilient flange against which the needle hub may seat or which may serve as a washer or bumper when the vial body is used in a metal syringe frame.

A further object is to provide, in a puncturable closure member, means to prevent the closure member from sliding inwardly upon puncture thereof by insertion of a needle cannula there-through.

With the foregoing and other objects in view, all of which will be more apparent as this description proceeds, the invention is exemplified in one preferred form in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawing, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size and details of construction of the apparatus may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawing:

Fig. 1 is a longitudinal view, partly in section, of a syringe cartridge embodying a preferred form of the invention.

Fig. 2 is a longitudinal view partly in section of a modified form of the invention.

Fig. 3 is a longitudinal view partly in section of another embodiment of the invention.

Fig. 4 is a longitudinal view partly in section illustrating another embodiment of the invention.

Referring to the drawing in which like characters of reference indicate corresponding parts, 10 indicates generally a tubular vial or cartridge body generally cylindrical in form having an open filling end 11 to receive a plunger 12. After the cartridge is filled the open end 11 may be closed

by a slidable cork 13 of any suitable type but preferably, as indicated herein, hollowed-out as by a concavity in its side walls as at 14. The opposite end of the vial body which may be termed the discharge end is provided with a discharge opening 15 at which the walls of the vial body are flanged radially inwardly as indicated at 16 providing a shoulder. Before the vial body is filled a discharge closure member generally indicated 17 is mounted within the vial body at the discharge end opening so as to close the same and provide a sealing means. As is obvious from the drawing, the discharge closure member 17 is inserted from the filling end 11 and is pressed into engagement with the inturned flange 16 at the discharge end so that the major part of the body of the closure member 17 is within the vial body for tight sealing purposes. This closure member is of resilient material and is tubular, as indicated at 18, except for a wall 19 of the resilient material which normally maintains the tube closed but is puncturable by one end of an injection needle sharpened at both ends, one end of which may be inserted through the opposite end of the tube of the closure member. The wall 19 is recessed from the inner end of the closure member so that when the needle penetrates the wall 19 the point of the needle will lie within the recess and will not be injured by the depression of the opposite closure member 13 upon manipulation of the plunger 12. The tube portion 18 of the closure member 17 is adapted to receive therein one end of a needle supporting member 20. In Figs. 1, 3, and 4 this needle supporting member 20 is illustrated as a substantially rigid nipple having one end embedded in the resilient body of the closure member and extends therefrom, providing a free end having threads thereon to which the hub 21 of the needle may be threadedly connected.

In Fig. 2 the tubular portion 18 of the closure member is itself threaded as at 22 to receive therein a complementary threaded portion 23 of the needle hub member 21.

The forming of the vial body radially inwardly at the discharge end opening makes the closure member self-sustained against blowing outward upon operation of the syringe. Means are also provided to prevent the closure member from being pushed inwardly when the needle is inserted. In Figs. 1 and 2, said means consists of a radially outward flange 24 which provides a groove into which the inwardly formed wall 16 of the vial body engages so that the flange 24 is disposed exteriorly of the inwardly formed portion of the vial body and in this connection serves to

prevent the closure from sliding inwardly upon insertion of the needle through the puncturable wall 19, provides a washer to prevent any leakage around the needle hub 21, provides a bumper for the needle hub to prevent fracture of the inwardly turned wall which is particularly advantageous in glass syringe bodies, and also provides a resilient washer or bumper when the tubular body or vial is dropped into a metal syringe frame in case it is desired to use it in that form. Also, because of its resilience, it is compressed by the needle hub tightly abutting it, and thereby serves as an expandible friction means or friction lock to prevent the needle and hub from inadvertently becoming loose at its mounting. In Figs. 3 and 4 the hub 21 of the needle seats upon a portion 25 of the closure member which protrudes through the opening 15 and thus serves as a washer and bumper in the same manner as the flanges 24 in Figs. 1 and 2. However, in Figs. 3 and 4 the means to prevent the inward sliding of the closure member is formed in the vial body, in Fig. 3 being indicated as an inwardly formed annular groove 26 through which the closure member will slide by reason of its resilience. The diameter of the vial body at this groove 26 is preferably greater than the diameter of the opening 15, or in other words the shoulder 16 extends radially inwardly to a greater extent than the inwardly formed groove 26 since the pressure against the shoulder 16 in the operation of the syringe is greater than the rearward pressure on the closure member for the purpose of puncturing the wall 12 with the end of a needle.

In Fig. 4 the means for preventing the rearward movement of the closure member 17 consists of an outwardly formed bead 27 which provides an inwardly opening groove 28 in the inner wall of the vial body. The closure member 17 is preferably formed with side walls which are concave as at 29 which provides an edge 30 at the inner end thereof which readily seats in the groove 28, thus resisting the pushing inwardly of the closure member when the needle perforates the wall 19.

Having thus described my invention, I claim:—

1. A syringe cartridge including an elongated tubular vial body having an opening at a filling end for receiving a plunger and having a discharge end opening, a closure member for closing said filling end and being snugly slidable longitudinally of the vial body, a discharge closure member of resilient material mounted at the discharge end opening of the vial body, said last mentioned closure member being tubular and having a puncturable wall of said resilient material normally closing said tube, said last mentioned closure member having at its outer end portion means for releasable mounting thereto of an injection needle hub in abutting contact with the closure member and in fixed relation against longitudinal pressure within the vial body when the puncturable wall has been punctured by an injection needle, said cartridge including means for maintaining said discharge closure member

against sliding longitudinally inwardly of the vial body, and the said discharge closure member being extended beyond the confines of the vial body and providing a resilient frictional grip bumper and sealing washer against which the hub of a needle may abut when mounted to the cartridge.

2. A syringe cartridge including an elongated tubular vial body having an opening at a filling end for receiving a plunger and having a discharge end opening whereat the wall of the said body is flanged radially inwardly, a closure member for closing said filling end, a discharge closure member of resilient material mounted at the discharge end opening of the vial body, said last mentioned closure member being tubular and having an integral puncturable wall of said resilient material intermediately spaced from the ends of the tube and normally closing said tube, said cartridge having at its discharge end portion means adapted for releasable mounting thereto of an injection needle hub in abutting contact with the resilient closure member and in fixed relation against longitudinal pressure within the vial body when the puncturable wall has been punctured by an injection needle, the said cartridge including means for resisting the inward movement of said closure member longitudinally of the vial body and the said discharge closure member providing a resilient frictional grip bumper and sealing washer against which the hub of the needle abuts when mounted to the cartridge.

3. A syringe cartridge including an elongated tubular vial body having an opening at a filling end for receiving a plunger and having a discharge end opening whereat the wall of the said body is flanged radially inwardly, a closure member for closing said filling end and being snugly slidable longitudinally of the vial body, a discharge closure member of resilient material mounted at the discharge end opening of the vial body, said last mentioned closure member being tubular and having an integral puncturable wall of said resilient material intermediately spaced from the ends of the tube and normally closing said tube, said last mentioned discharge closure member having a radially outward resilient flange for lying outside the discharge opening of the vial body and engaging the exterior of the inwardly flanged portion of the vial body at the discharge opening, and a tubular member of rigid material disposed in the tube of the resilient closure member axially outwardly from the puncturable wall and adapted for receiving and supporting an injection needle in abutting contact with the resilient closure member and in fixed relation against longitudinal pressure within the vial body when the puncturable wall has been punctured by an injection needle, the said discharge closure member providing a resilient sealing washer and frictional grip bumper against which the hub of the needle may abut when mounted to the closure member.

GEORGE N. HEIN. 60