

July 5, 1966

M. KRAUTHAMER

3,259,130

HYPODERMIC SYRINGE

Filed May 23, 1963

FIG. 1

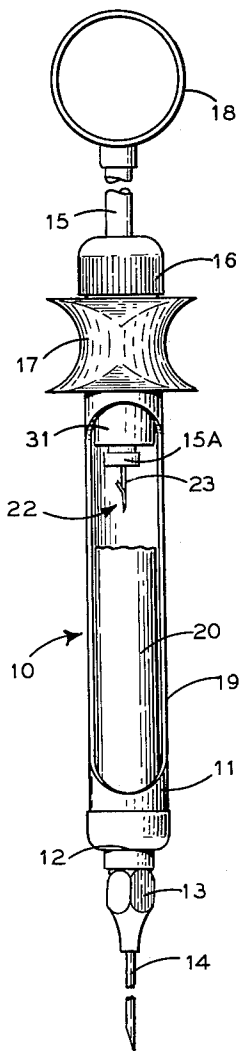


FIG. 3

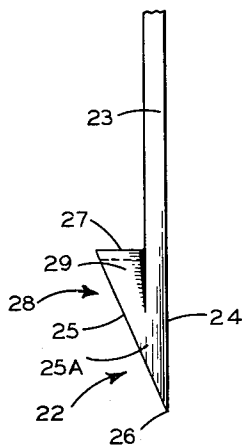


FIG. 4

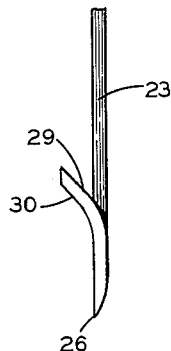


FIG. 5

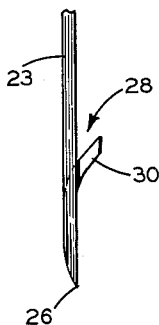
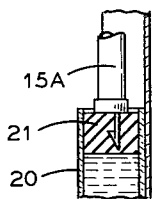


FIG. 2



INVENTOR.

Martin Krauthamer

BY

Irving Seidman

ATTORNEY

1

3,259,130

HYPODERMIC SYRINGE

Martin Krauthamer, Bayside, N.Y., assignor to Universal Brass Turning Co., Inc., a corporation of New York
Filed May 23, 1963, Ser. No. 282,605
4 Claims. (Cl. 128—218)

This invention relates to hypodermic syringes and more particularly concerns syringes of the ampule carrying type.

It is desirable that hypodermic syringes of the ampule carrying type have an aspirating action when desired, which necessitates a positive engagement of the plunger of the syringe with the usual piston stopper reciprocally disposed within the ampule.

Various syringe constructions have been proposed to effect such an engagement, including the screw threading of the forward end of the plunger for threaded engagement with a threaded recess in the piston stopper. Necessarily this requires a special piston stopper construction and an inconvenient rotary motion of the plunger to engage the stopper.

To avoid such rotary motion and to make possible the positive engagement of conventional piston stoppers, it was proposed to provide the syringe plunger with a barbed hook which is embedded directly in the stopper by projection of the plunger. However, it has been found that the engaging action of this type of hook was not uniform, resulting in the need for repeated projection of the plunger to obtain positive engagement and which is undesirable in normal usage of the syringe. Also, at times the hook cut the stopper in a manner to form a recess in the stopper such as to prevent positive engagement of the hook with respect to the stopper; the hook moving out of the recess upon retraction of the plunger.

Accordingly, an object of this invention is to provide in a hypodermic syringe of the aspirating type, improved hook structure for effecting positive engagement with the piston stopper of an ampule carried by the syringe.

Another object of this invention is to provide a simple hook structure for an aspirating syringe, which hook structure is easily formed and provides for positive engagement with the piston stopper upon a single advanced movement of the syringe plunger.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

In the drawing,

FIG. 1 is a side elevational view of a hypodermic syringe embodying the invention, with the hook thereof in a withdrawn, non-engaged relation to the piston stopper of the ampule;

FIG. 2 is a partial view in section, showing the hook in embedded, engaged relation to the piston stopper of the ampule;

FIG. 3 is a side elevational view of the hook portion of the syringe;

FIG. 4 is a front edge elevational view thereof; and

FIG. 5 is a rear edge elevational view thereof.

The hypodermic syringe of the instant invention comprises as a novel feature thereof an improved hook structure which is mounted on the forward end of the plunger of the syringe for embedment in the piston stopper of an ampule carried by the syringe when the plunger is advanced longitudinally, thereby positively negating the stopper so as to withdraw the same upon retraction of the plunger, whereby to effect an aspirating action.

Thus, as shown in FIG. 1, 10 designates a syringe embodying the invention. The same comprises a magazine 11 of cylindrical shape with a head portion 12 at the forward end thereof for mounting thereon the hub 13 of the usual needle 14. A plunger 15 is mounted in a guide portion 16 at the rear end of magazine 11 to

2

allow for reciprocatory movement of plunger 15 longitudinally of the magazine 11, in a known manner. Finger holds 17 project laterally from the guide portion 16 and a thumb receiving ring 18 is fixed to the outer end of plunger 15.

The magazine 11 is formed with an elongated opening 19 in the wall thereof to allow for the placement of the usual medicament containing ampule 20 within the magazine. The ampule 20 which takes the form of a tubular member of glass or other suitable material, carries the usual needle stopper at its forward end, not shown and a piston stopper 21 at the rear end thereof which is reciprocable within the ampule. The insertion of the ampule 20 within magazine 11 is a well known procedure and requires no further elaboration.

Means is provided at the forward end 15A of the plunger 15, which is disposed within magazine 11, for engaging piston stopper 21 so as to allow retraction thereupon withdrawing plunger 15. Such means takes form of a hook member generally indicated at 22 which includes an elongated shank 23 fixed at its rear end in the forward end 15A of plunger 15.

The hook member 22 is of triangular shape with a longitudinally extending edge 24 which is a continuation of one edge of shank 23; an inclined rectilinear edge 25 merging with edge 24 to form point 26; and a short rectilinear edge 27 extending at right angles to the longitudinal axis of plunger 15. Edges 25 and 27 define a barb portion extending laterally of edge 24.

The barb portion 28 is deflected with respect to the longitudinal axis of shank 23, as shown in FIGS. 4, 5, and the opposite surface portions 29, 30 thereof are somewhat convexly and concavely curved, respectively.

Furthermore, edge portion 24A along edge 24 is bevelled to sharpen edge 24 and similarly edge portion 25A along edge 25 is also bevelled.

It has been found that the hook member 22 which is ground, lapped and honed along the edges and surfaces thereof, enters the piston stopper 21, which is formed of rubber or the like, in a manner to locate the barb portion 28 within the stopper in a positive engaging manner. Thus, a single advanced movement of plunger 15 allows the stopper 21 to be immediately engaged for retracted movement when the syringe user desires an aspirating action. Repeated reciprocation of the plunger 15 finds the stopper 21 constantly engaged therewith. The stopper 21 is disengaged in the usual manner when the plunger 15 is completely retracted.

It has been found that optimum results are attained when the edge 25 of barb portion 28 is at an angle of from 30 to 35° with respect to edge 24; and when the deflection of the barb portion 28 from the longitudinal axis, as indicated in FIGS. 4, 5 is of the order of about 45°.

It is understood that the ampule 20 is retained within magazine 11 by a spring pressed collar member 31 which is retractable upon withdrawn movement of plunger 15, in a manner known in the art, to allow for the insertion of the ampule 20 in said magazine 11. In the fully withdrawn position of the plunger 15, the hook member 22 thereon is disposed within collar member 31.

As various changes might be made in the embodiment of the invention herein disclosed without departing from the spirit thereof, it is understood that all matter herein shown or described is deemed illustrative and not limiting except as set forth in the appended claims.

What is claimed is:

1. In a hypodermic syringe having a magazine for holding a medicament containing ampule with a piston stopper reciprocally disposed within said ampule and a plunger reciprocally mounted on said syringe for longitudinal movement within said magazine, a hook mem-

3

ber fixed on the forward end of said plunger for embedding engagement with said piston stopper to allow for positive retraction of said piston stopper upon retraction of said plunger, said hook member comprising a flat shank portion having at the lower end thereof oppositely disposed faces extending substantially parallel to the longitudinal axis of said plunger and a triangular shaped barb portion extending laterally from said lower shank portion, the upper portion of said barb portion being laterally displaced with respect to the faces of said shank portion, the lower portion of said barb portion merging laterally with the lower end of said shank portion, said barb portion including an inclined edge converging toward the outer edge of the lower end of said shank portion to form a point at the juncture of said inclined edge and said outer edge of said shank portion.

2. In a syringe as in claim 1 wherein said triangular

4

barb portion includes a convexly curved outer face and a concavely curved inner face.

3. A syringe as in claim 1, wherein said barb portion includes an edge portion extending from the upper end of said inclined edge toward said shank and at right angles to the longitudinal axis of said shank.

4. A syringe as in claim 1 wherein said inclined edge and the outer edge of said shank portion are bevelled.

References Cited by the Examiner

UNITED STATES PATENTS

172,104	1/1876	Engelsdorff	81-3.49
211,777	1/1879	Pierce	43-6
2,904,044	9/1959	Jalar et al.	128-218

RICHARD A. GAUDET, *Primary Examiner*.

ROBERT E. MORGAN, *Examiner*.