

[54] SYRINGE PACKAGE

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[22] Filed: Apr. 27, 1972

[21] Appl. No.: 248,222

[52] U.S. Cl. 206/43, 128/218 D

[51] Int. Cl. A61m 3/00, B65d 85/54

[58] Field of Search 206/17.5, 43, 63.2 R, 206/16.5; 128/218 D, 218 NV, 218 N, 218 R, 215

[56] References Cited UNITED STATES PATENTS

1,614,807 1/1927 Stewart 206/16.5

3,008,570 11/1961 Roehr et al. 206/43
2,828,742 4/1958 Ashkenaz 128/218 D

FOREIGN PATENTS OR APPLICATIONS

867,972 5/1961 Great Britain 128/218 NV

Primary Examiner—William T. Dixon, Jr.

[57]

ABSTRACT

A package for a hypodermic syringe having a relatively shiftable barrel and needle assembly for arming the syringe is provided which includes a needle sheath engageable with the needle assembly for arming the syringe when unpackaged, and a sleeve member encircling the syringe and holding the proximal end portion of the sheath radially inwardly against a portion of the syringe to prevent inadvertent arming.

5 Claims, 3 Drawing Figures

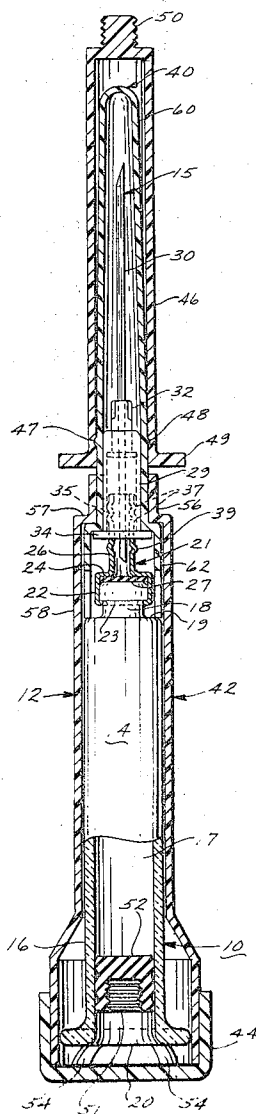


FIG. 1

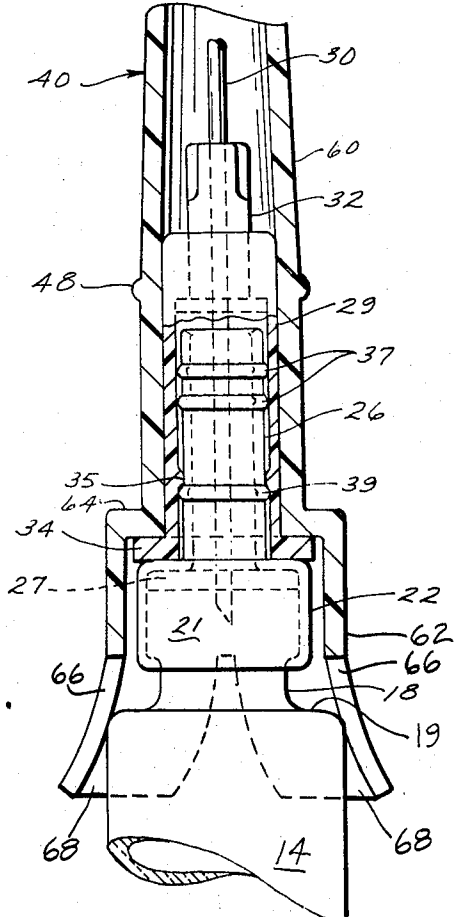
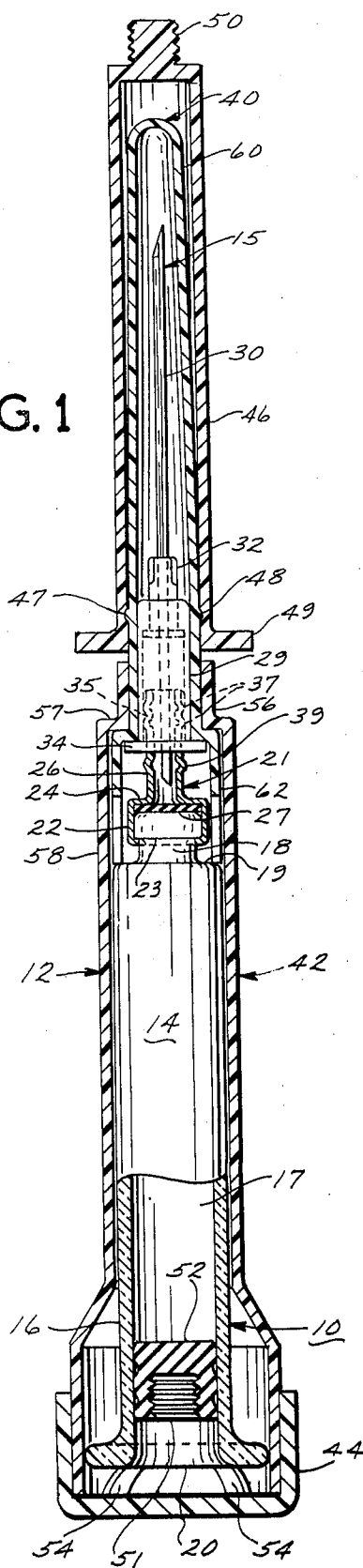


FIG. 2

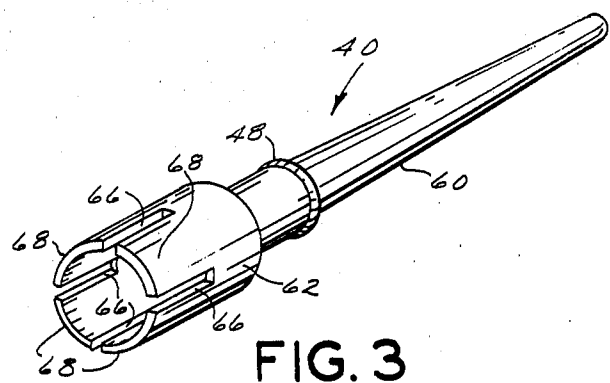


FIG. 3

SYRINGE PACKAGE

BACKGROUND OF THE INVENTION

This invention relates to packages for syringe and needle assemblies, and more particularly to a package for a unit dose or prefilled hypodermic syringe and needle assembly of the type in which the syringe barrel and needle assembly are relatively shiftable to effect arming thereof.

U.S. Pat. No. 3,008,570, assigned to the same assignee as the present application, discloses a package for a hypodermic syringe and needle assembly having a needle sheath and enclosing sleeve member which are relatively movable for removing the hypodermic syringe and needle assembly from the package. The syringe and needle assembly, however, are not of the shiftable type and the package does not require means for preventing inadvertent arming of the syringe. In application Ser. No. 26,681, filed Apr. 8, 1970, and assigned to the same assignee as the present application, a package for a unit dose or prefilled syringe having a shiftable syringe barrel and needle assembly is provided with means for preventing inadvertent arming of the needle while providing a sheath which can be utilized in arming the syringe and needle assembly. While this package has proved very satisfactory in use, prior packages for syringe and needle assemblies of the shiftable type have been relatively complicated and expensive in construction in order to ensure that the assembly cannot be inadvertently armed when packaged, while at the same time, provide a sheath portion of the package which can be used to safely assist in the arming of the syringe and needle assembly.

SUMMARY OF THE PRESENT INVENTION

It is therefore an object of the present invention to provide an improved package for a unit dose or prefilled syringe and needle assembly.

Another object of the present invention is to provide a package for a syringe and needle assembly of the type that are relatively movable to effect arming thereof wherein the package is characterized by simplicity and economy of construction, which prevents the inadvertent arming of the syringe and needle assembly, and wherein the package includes a sheath for assisting in the arming when in an unpacked condition.

Yet another object is to provide a packaged syringe and needle assembly which is characterized by ease of operation and use and which prevents inadvertent arming of the syringe and needle assembly in the packaged condition, yet assists in arming the syringe and needle assembly when in an unpacked condition.

In accordance with one form of the present invention a package for a syringe and needle assembly of the type that are relatively movable to effect arming is provided that includes a needle sheath having a proximal end portion engageable with a portion of the syringe for preventing arming of the syringe and needle assembly and which is movable radially outwardly away from the syringe portion to permit arming, and a cover member adapted to encircle the proximal end portion of the sheath to prevent radial movement thereof and arming of the syringe and needle assembly.

These and other objects and advantages of the present invention will become apparent from the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal cross-sectional view of a syringe package according to the present invention enclosing a syringe and needle assembly;

FIG. 2 is an enlarged cross-sectional view of a portion of the package and syringe and needle assembly of FIG. 1 with the syringe and needle assembly armed; and

FIG. 3 is a perspective view of the needle sheath of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, there is shown in FIG. 1 a hypodermic syringe and needle assembly 10 disposed within a syringe container or package 12. The syringe and needle assembly 10 is of the unit dose or prefilled type that includes a syringe 14 and needle assembly 15 which are relatively axially movable or shiftable between an unarmed position (FIG. 1) and an armed position (FIG. 2), as will be discussed more fully hereafter.

The syringe 14 is shown including a barrel 16 open at its proximal end and having a main reservoir portion 17, and a distal end portion 18 of reduced diameter which is connected by a generally radially inwardly extending portion 19 to the main portion 17. The barrel 16 is also provided with an enlarged flange 20 at its proximal end which is adapted to be engaged by the fingers during use of the assembly 10. A connector 21 is shown having an enlarged annular portion 22 secured to the distal end portion 18 of the barrel, such as by crimping it over a shoulder 23 provided on the end portion 18. The connector 21 is provided with an integral, radially inwardly extending wall 24 and an axially extending cylindrical portion 26. A seal 27, shown as a relatively thin rubber diaphragm member, is disposed in the connector 21 between the distal end of barrel 16 and the interior side of wall 24 to normally close the distal end of the barrel.

The hypodermic needle assembly 15 is shown including a plastic hub 29 having a double ended cannula 30 connected thereto. The cannula 30 is shown connected to a metal ferrule 32, which may be swaged thereon, which is secured to the hub 29, for example, by molding the hub onto the ferrule or by a suitable cement. The hub 29 is also provided with an annular flange 34. The needle 30 is shown in the drawings extending through the hub and being pointed at both the distal end and proximal end thereof. The hub 29 has an internal bore which slidably receives the axial portion 26 of the connector 21 with the proximal end of the needle 30 disposed within the portion 26 of the connector. The internal walls of the hub bore frictionally engage the outer surface of the axial portion 26. An annular bead in the hub bore, indicated at 35, is shown in FIG. 1 between a pair of external annular beads 37 provided on the portion 26 of the connector 21 to position and frictionally hold the needle assembly 10 on the connector in the unarmed position. The hub, when moved axially towards the barrel, is slidable over beads 37 and another annular bead 39 and into fluid tight sealing engagement with the connector 21 in the fully armed position of the syringe and needle assembly 15, the position shown in FIG. 2. In this position, the proximal end of the needle cannula pierces the rubber diaphragm 27

and is in fluid communication with the interior 17 of the syringe barrel 16.

The package 12 completely encloses the syringe and needle assembly 10 to protect and maintain it in a sterile condition, and also to prevent the syringe and needle assembly from being inadvertently armed prior to use. The package 12 includes a needle sheath 40, a cylindrical cover member or protective sleeve 42 connected to the sheath, and an end cap 44. In the illustrative embodiment, a hollow elongated piston rod for the syringe is shown at 46 surrounding and attached to the sheath 40. An annular groove 47 on the interior surface of the rod 46 is shown disposed over a bead 48 provided on the exterior of the sheath 40 so as to maintain the piston rod 46 frictionally attached to the package 12. The rod 46 is provided with a flange 49 at its proximal end for engagement by the thumb of a user, and with a reduced diameter threaded end portion 50 at its distal end which is adapted, during use of the syringe, to be inserted into a threaded opening 51 in a piston 52, such as a rubber piston, shown disposed in the barrel 14 in FIG. 1. If desired, the sleeve 42 may be made long enough so that the piston rod, such as rod 46, can be enclosed therein instead of positioning it exteriorally of the sheath as shown in the illustrated embodiment.

The cover member or sleeve 42 has an enlarged portion at the proximal end thereof for fitting over the flange 20 of the barrel 16. The cap 44 is secured, for example, by a heat seal, to the proximal end of the cover member to close the same and is shown having a pair of resilient integral tabs 54 which engage the proximal end of the barrel 16 to limit movement thereof. Cover member 42, in the illustrated embodiment, is provided with a reduced collar 56 at the distal end thereof which is connected by a radially inwardly extending portion 57 to the main cylindrical cover portion indicated at 58. The sheath 40, as seen in FIG. 1, covers the needle assembly 15 and extends into the cover member. The needle sheath 40 includes a main, generally tubular or cylindrical portion 60 which is closed at the distal end thereof, and an enlarged diameter proximal end portion 62. An integral radially outwardly extending portion, indicated at 64, connects end portion 62 with the main portion 60. The proximal end portion 62 is of greater diameter than the main portion 60 of the sheath and the collar 56 of cover member 42 to retain the sheath within the sleeve. The collar 56 frictionally engages the main portion 60 of the sheath.

The sheath 40 is preferably formed of a plastic material such as polypropylene, with the proximal end portion 62 made sufficiently flexible to flare outwardly or move radially outwardly when unrestrained and in response to an applied force acting to move the syringe and sheath toward each other. This may be accomplished by forming the end portion 62 with one or more slots 66 and fingers 68. In the illustrated embodiment, and as more clearly seen in FIG. 3, the proximal end portion 62 is formed with four circumferentially spaced axially extending slots 66 defining four flexible axial fingers 68.

As seen in FIG. 1, the proximal end portion 62 of the sheath engages a radially extending portion of the syringe which, in the drawing, is the radially inwardly extending portion 19 of the barrel 16 to limit relative movement of the sheath 40 and syringe 14. The fingers 68 extend closely between connector portion 22 and

the interior wall of the main portion 58 of the cover member 42, and the proximal end of each finger engages the portion 19 of the barrel 16. Thus, in the packaged condition of syringe and needle assembly 10, movement of sheath 40 and needle assembly 15 toward the syringe 14 are positively prevented since the fingers 68 of end portion 62 engage the syringe 14 and are restrained against radial outward movement by the cover member 42. Also, the end portion 62 of the sheath is restrained against radial inward movement by the portion 22 of the connector 21. The interior wall of the radially outwardly extending portion 64 of the sheath engages the proximal end flange 34 of needle hub 29 for moving the hub and assisting in the arming of the syringe and needle assembly during use, as will be discussed hereinafter, but the sheath cannot move the hub toward the barrel 16 to effect arming in the packaged condition shown in FIG. 1 even if forces are applied to the sheath and cover member 42 tending to move them together. With the proximal end portion 62 engaged between the barrel portion 19 and the radial portion 57 of the cover, the sheath 40 and syringe 14 are immovable in either direction relative to the cover 42 in the packaged condition of the assembly.

When it is desired to use the hypodermic syringe and needle assembly 10, the end cap 44 is removed from the cover by breaking the heat seal, for example, and piston rod 46 is removed by sliding it forwardly from the sheath 40. The rod 46 may then be threadedly connected with the piston 50. The sheath 40 and cover member 42 are then grasped and urged toward each other to effect relative movement therebetween so that the syringe and needle assembly 10, with the sheath 40 disposed thereon, is moved through the cover 42 to thereby remove the cover from the assembly 10. At this point, the assembly 10 is still unarmed and the sheath is enclosing the needle 30 and in frictional engagement with the connector 21. The assembly 10 and sheath 40 can be handled and, for example, placed on a hard surface without danger of damage or loss of sterility to the needle.

In order to now arm the syringe or needle assembly 10, that is to connect the needle lumen in fluid communication with the interior of the syringe, the syringe barrel 16 and sheath 40 may be manually grasped and urged toward each other to effect relative axial movement between the needle assembly 15 and the barrel 16. During this relative movement, the fingers 68 of the proximal end portion 62 of the sheath flex or move radially outwardly off of the radial extending portion 19 of the syringe and over the periphery of the barrel member 16, as shown in FIG. 2, while the radial portion 64 of the sheath engages the flange 34 of the needle hub 29 carrying the needle assembly 10 toward the barrel 16 until the hub flange 34 engages the radial extending portion 24 of the connector 21 of the syringe. During this arming of the assembly 10, the proximal end of the needle 30 pierces the seal 27 to connect the needle in fluid communication with the interior of the barrel 16. In the armed position the internal surface of the hub, of course, is sealingly engaged with the connector 21, as previously mentioned herein. With the syringe and needle assembly 10 in an armed condition, the sleeve may be removed in a direction away from the barrel 16 when it is desired to use the syringe and needle assembly, for example, for the injection of a medicament. As will be noted, the sheath 40 and the needle

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assembly 15 remain together as they are removed from the cover 42 so that the sheath continuously shields the needle assembly until it is desired to use the syringe.

While the sheath portion 62 in the illustrated embodiment engages the radial portion 19 of the barrel, it will be apparent that with slight modification, the portion 62 may engage the radial portion 24 of connector 21 of the syringe.

It is now apparent that applicant has provided an economical and effective package for a syringe having a sheath of simple and economical construction for preventing the inadvertent arming of the syringe and needle assembly while in the packaged condition, and which can be used in assisting in the arming of the syringe and needle assembly. Also, the parts of the package may be formed of a suitable plastic material, for example, polypropylene, so that the device may be of the single-use or disposable type.

It should be understood, that, although this invention has been described with reference to the illustrated embodiment, modification thereto may be made without departing from the true spirit and scope of the invention.

What is claimed is:

1. A package for a syringe and a needle assembly that are relatively movable from an unarmed condition to an armed condition comprising a generally cylindrical cover member having an open proximal end and including a main cover portion receiving the syringe and a reduced diameter open distal end portion having a smaller inner diameter than that of said main cover portion, and a sheath engageable with the needle assembly for assisting in effecting relative axial movement between the syringe and the needle assembly to arm the same, said sheath including a main sheath portion shielding the needle assembly, and a radially outwardly flexible proximal end portion having a larger inner diameter than that of said main sheath portion and received in said main cover portion between a por-

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tion of the syringe adjacent the distal end thereof and said distal end portion of said cover member for limiting relative axial movement between the syringe and said sheath, and means connected to said cover member for closing said open end of said cover, member the inner walls of said main cover portion being disposed closely adjacent said proximal end portion of said sheath for preventing radially outward movement thereof to prevent relative axial movement between the syringe and said sheath to thereby obviate inadvertent arming of the syringe and needle assembly in the packaged condition thereof, the syringe and needle assembly and said sheath being movable together through said open end of said cover member to remove said cover member therefrom, the syringe and said sheath being relatively axially movable toward each other in response to applied forces thereon when said cover member is removed therefrom to effect flexing of said proximal end portion of said sheath radially outwardly from said syringe portion to effect relative axial movement between said syringe and needle assembly for arming the syringe and needle assembly.

2. The package according to claim 1 wherein said cover member and said sheath are formed of plastic material.

3. The package according to claim 2 wherein said proximal end portion of said sheath is generally cylindrical and has a plurality of slots extending axially from the proximal extremity thereof defining a plurality of resilient fingers.

4. The package according to claim 1 wherein said distal end portion of each cover member defines a collar surrounding said main sheath portion.

5. The package according to claim 1 wherein in the syringe has a barrel with a radially inwardly extending distal end, and said sheath is engageable with said distal end of said barrel in the packaged condition.

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