

- [54] **ASPIRATING SYRINGE WITH GRASPING RINGS**
[75] Inventor: **Leland C. Gravlee**, Mountain Brook, Ala.
[73] Assignee: **Becton Dickinson and Company**, East Rutherford, N.J.
[22] Filed: **Oct. 15, 1971**
[21] Appl. No.: **189,612**
[52] U.S. Cl. **222/323, 128/218 P**
[51] Int. Cl. **G01f 1/06**
[58] Field of Search **128/218 P, 218 PA, 128/234; 222/323, 386, 409**

2,959,170 11/1960 Laub 128/218 P

Primary Examiner—Samuel F. Coleman
Attorney—David S. Kane et al.

[57] **ABSTRACT**

A hypodermic syringe barrel has a delivery tip at one end and an axially movable plunger spaced within the barrel movable toward and away from the delivery tip. A grasping ring is connected to the barrel at the opposite end of the barrel from the delivery tip. A pair of axially movable grasping rings are oppositely spaced along the sides of the barrel. Each of the movable rings is connected to the plunger. The movable rings fit through guide slots in the barrel. When the movable rings are conveyed toward the end-mounted grasping ring, while the grasping ring is braced against motion, the syringe is aspirated.

- [56] **References Cited**
UNITED STATES PATENTS
2,847,009 8/1958 Blease 222/323 X
2,902,034 9/1959 Simmonds 128/218 P

2 Claims, 3 Drawing Figures

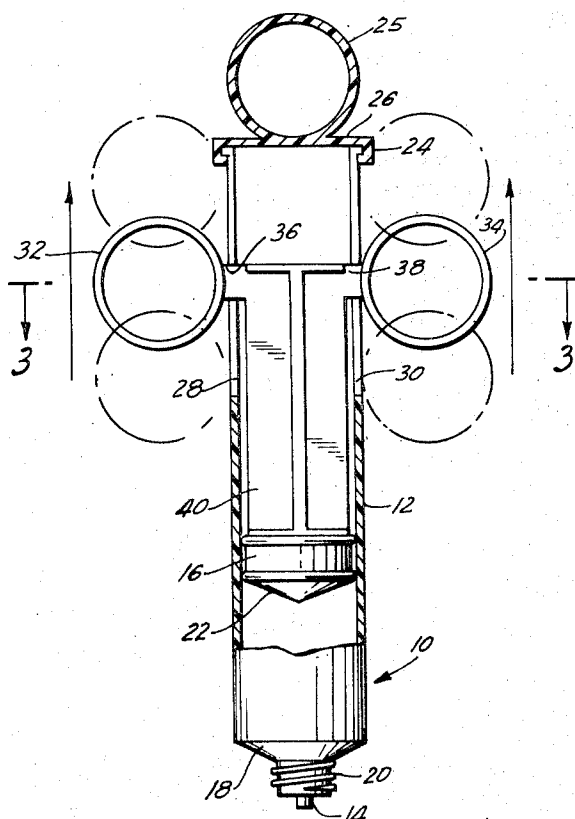


FIG. 1

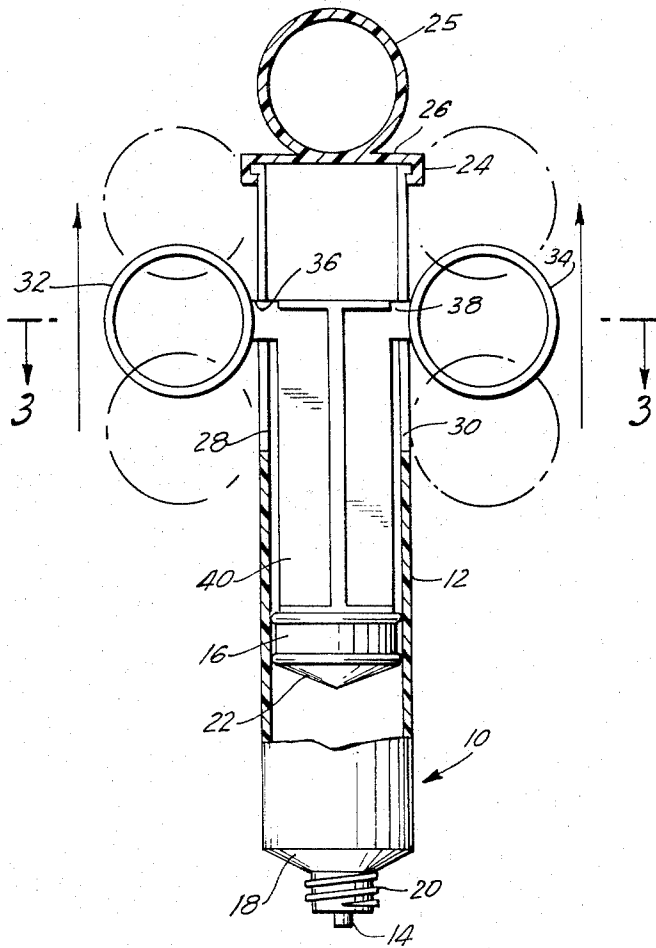


FIG. 2

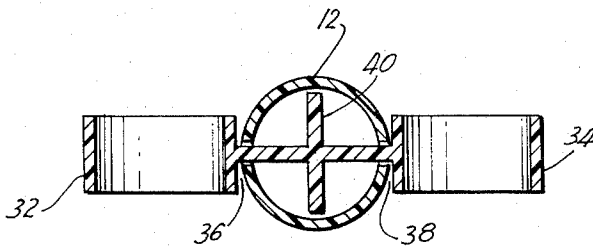
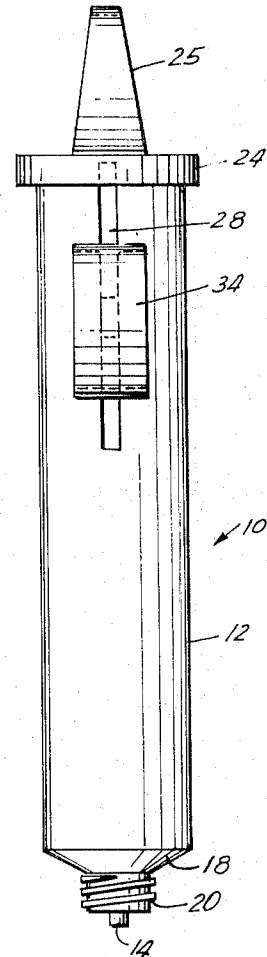


FIG. 3

INVENTOR
LELAND C. GRAVLEE

ASPIRATING SYRINGE WITH GRASPING RINGS

BACKGROUND OF THE INVENTION

The invention relates to an improved syringe barrel. More particularly, it relates to a syringe which may be aspirated by movements normally associated with closing or clinching the syringe.

Conventional hypodermic syringe barrels are filled by withdrawing a handle portion from the barrel, wherein the handle portion is connected to a plunger. Movement of the handle away from the barrel of the syringe creates a negative pressure within the syringe barrel below the plunger. Fluids are then drawn into the syringe through the delivery tip.

Normally two hands are required to fill the syringe. One hand grasps the syringe barrel to prevent movement while the other hand grasps the handle attached to the plunger and withdraws it from the syringe. On the other hand, to eject the fluid from the syringe barrel, only one hand is generally required. Usually the end of the syringe barrel nearest the handle has a projecting flange. Two fingers of one hand may be inserted underneath the flange, while the thumb depresses the handle. It is seen that by clenching or closing the hand, the handle is depressed and fluid is ejected from the syringe.

Often, doctors, nurses and other medical technicians have expressed the desire for a syringe which is capable of being grasped and filled with one hand. Such a syringe would permit the other hand to be used for other purposes such as restraining a patient, readying other medical instruments or the like. In particular, such a syringe could be filled by a clenching or closing action of the hand.

SUMMARY OF THE INVENTION

It is, therefore, a primary object of the invention to provide a hypodermic syringe barrel which is filled by the clenching or closing of a hand.

It is another object of the invention to provide a syringe barrel which is capable of being filled and discharged by the opening or closing of a grasping hand.

It is an additional object of the invention to provide a syringe barrel which is filled by closing certain portions of the syringe and discharged by moving portions of the syringe away from each other.

The above and other objects are obtained in a hypodermic syringe barrel having a delivery tip at one end and an axially movable plunger spaced within the barrel movable toward and away from the delivery tip for aspirating and ejecting fluids associated with the syringe barrel. The plunger is actuated by means of a first grasping ring connected to the barrel at the end opposite the delivery tip. A pair of axially movable grasping rings are oppositely spaced along the sides of the barrel and each of the movable rings is connected to the plunger. A pair of longitudinal guide slots extend through the barrel, each guide slot having one of the movable grasping rings extending therethrough.

When the side mounted grasping rings are moved toward the end mounted grasping ring and the plunger is moved away from the delivery tip, a suction is created within the syringe barrel thereby causing the barrel to fill with fluid.

DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate a somewhat preferred embodiment of the invention in which:

FIG. 1 is a sectional view of the improved syringe barrel illustrating the relative positions of the grasping rings as they are moved away from the delivery end of the barrel;

FIG. 2 is a planned view of the improved syringe barrel wherein the barrel is rotated 90° with respect to the view depicted in FIG. 1; and

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

Turning now to FIG. 1 syringe 10 includes barrel 12, delivery tip 14 and piston 16. The syringe barrel may be formed from any suitable material which is inert to the medicaments or other materials used therein. Thus, it may be made from glass, or a suitable plastic material such as polypropylene, polyethylene or polystyrene. The barrel includes at one end a tapered end wall 18 and a projecting tip 14. A threaded hub section 20 is provided adjacent the delivery tip in order to permit a hypodermic needle having an internally threaded hub portion (not shown) to be inter-engaged. If desired a luer type thread and tapered delivery nozzle may be employed in lieu thereof.

Stopper or piston 16 is preferably made from a suitable elastomeric material which is inert to the medicaments used in the syringe, such as natural or synthetic rubber. The piston 16 is adapted to sealably engage the internal wall of the barrel and may have a tapered head portion 22 of corresponding configuration to the taper of the end wall 18.

The upper end of the syringe barrel 12 terminates in an annular shoulder 24. A hollow grasping ring 25 is sealingly connected to the top of the syringe barrel by means of integral annular cap 26 in sealing frictional contact with shoulder 24. If desired the syringe barrel could be molded integrally with the grasping ring mounted at one end of the barrel. As illustrated in FIG. 2 ring 25 has an external configuration resembling a trapezoidal arch and a circular internal configuration.

As depicted in FIGS. 2 and 3 syringe barrel 12 has a pair of longitudinal slots 28, 30 spaced on opposite sides of the barrel. The slots are of an elongated rectangular configuration. The slots are aligned in parallel relation to the central axis of the syringe barrel.

In order to actuate piston 16 a pair of grasping rings 32 and 34 are provided, each grasping ring having an integral neck portion 36 and 38 which is integrally connected with plunger stem 40. Plunger stem 40 is frictionally engaged with piston 16. Frictional contact may be accomplished by providing a conical recess within piston 16. At the end of plunger stem 40 a male conical shaped protuberance is adapted to be force fit within the mating conical recess in the piston. Other conventional connections may be employed.

As illustrated in FIGS. 2 and 3 side mounted grasping rings 32 and 34 are hollow cylindrical members formed from various rigid materials such as metal, or any suitable thermoplastic material such as polyethylene, polypropylene, polystyrene, cellulose acetate or the polymers or co-polymers of vinyl chloride. Plunger stem 40 may be formed from similar materials. The grasping rings are spaced on opposite sides of the barrel and are axially aligned with the central axis of the barrel. The respective neck portions 36 and 38 of the grasping rings pass freely through slots 28 and 30.

Slots 28 and 30 are elongated sufficiently along barrel 12 in order to permit grasping rings 32 and 34 to withdraw piston 16 sufficiently from delivery tip 14 in order to permit a desired amount of fluid to be introduced into the syringe barrel.

In use, side mounted grasping rings 32 and 34 are adjacent the lowermost ends of slots 28 and 30 toward the delivery tip. Next the forefinger and index finger are placed through the side mounted grasping rings and the thumb is inserted through top ring 25. Next, if not already engaged, a hypodermic needle is affixed to delivery tip 14 of syringe 10. The tip of the needle is placed beneath the fluid to be aspirated. Next, the side mounted finger rings are moved toward end mounted ring 25 by clenching or closing the user's fingers. This action withdraws piston 16 from the delivery tip and creates a negative pressure within the syringe barrel thereby allowing fluid to be drawn therein.

To discharge the syringe the hydrodermic needle (not shown) is inserted in the desired discharge area and the side grasping rings 32 and 34 are moved toward delivery tip 14 in their respective guide slots. This movement may be accomplished by merely unclenching the user's fingers.

It will be obvious that other grasping means, apart from the aforescribed grasping rings, may be employed. If desired, conventional u-shaped flanges, readily gripped by the fingers could be utilized. Similarly, ribbed or roughened finger gripping surfaces may be employed.

Further additions and embodiments will be obvious to those skilled in the art. While the particular embodiment of the present invention has been described in detail herein, it should be understood that the scope of

the invention is to be determined only from the appended claims.

I claim:

1. In a hypodermic syringe barrel having a delivery tip at one end and an axially movable plunger spaced within said barrel movable toward and away from the delivery tip for aspirating and ejecting fluids associated with the syringe barrel, the improvement by means of which the plunger is actuated which comprises:
 - a. a first grasping means connected to the barrel at the other end and extending axially rearwardly therefrom;
 - b. a pair of axially movable grasping means oppositely spaced along the sides of the barrel, each of the movable grasping means connected to the plunger and extending laterally therefrom, and
 - c. a pair of longitudinal guide slots extending through the barrel and having a predetermined length to facilitate control of the volume in the barrel between the forward plunger end and the delivery tip, each guide slot having one of said movable grasping means extending therethrough, whereby said plunger is grasped with one hand with the thumb on the first grasping means and a pair of fingers on each of said pair of movable grasping means respectively, and is manipulated by closing the hand so that said plunger is moved away from said delivery tip by moving said pair of grasping means toward said first grasping means.
2. The invention in accordance with claim 1 in which said first grasping means and said movable grasping means are rings.

* * * * *

35

40

45

50

55

60

65