

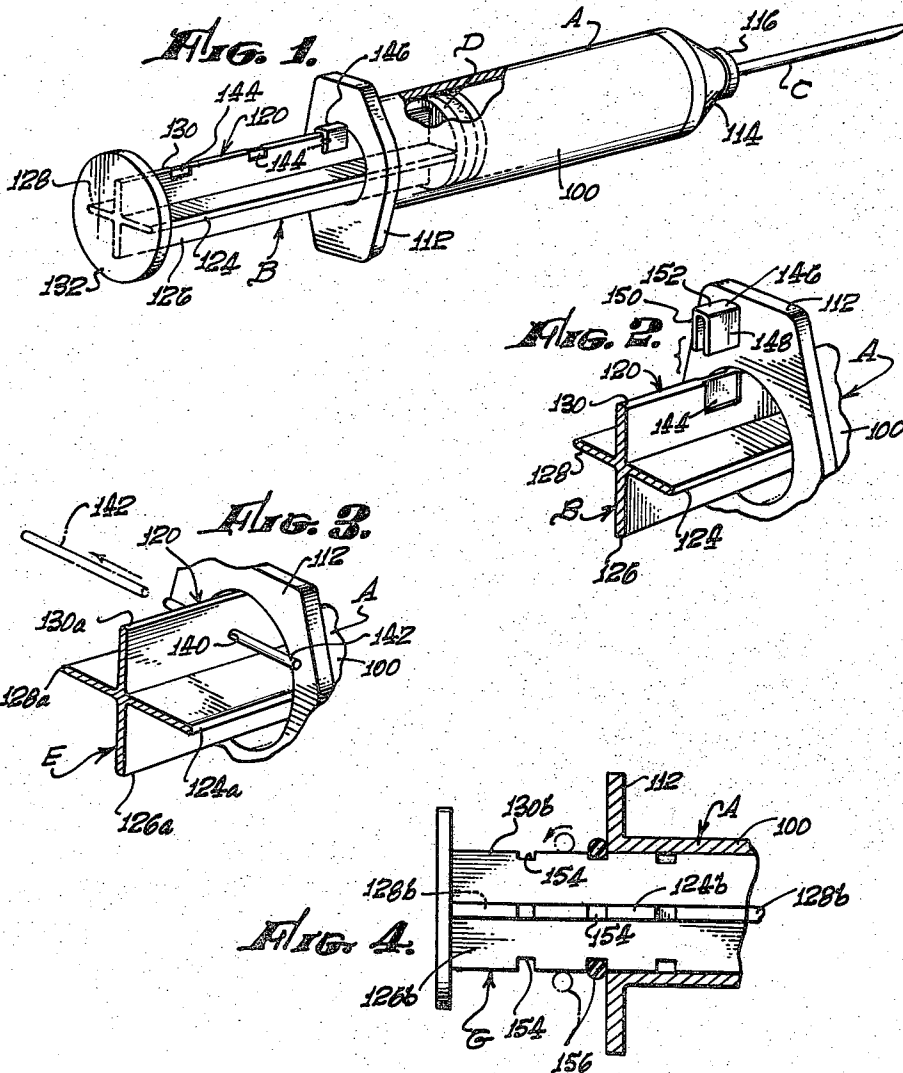
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SYRINGE STRUCTURE

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SYRINGE STRUCTURE

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3 Claims. (Cl. 128—218)

The present invention relates generally to dispensing devices, and more particularly to an improved multiple dosage syringe that automatically indicates when each of a number of doses of predetermined volume has been dispensed therefrom. The present application is a continuation-in-part of our Patent No. 2,764,981 entitled, Multiple Dosage Syringe, which issued October 2, 1956, and is a division of pending application entitled, Syringe Structure, filed in the United States Patent Office January 13, 1956 under Serial No. 558,971.

In the dairy industry, cows frequently are infected by mastitis, a disease which is combated by the injection of certain fluid materials into the teats by means of a syringe. A present-day practice in marketing such fluid materials is to package four disposable syringes filled therewith in a suitable box, with each syringe being discarded after use. Such disposable syringes are normally formed of a synthetic plastic material such as polyethylene, or the like.

Disposable syringes of the character described are convenient to use and assure that but a predetermined quantity of fluid material will be administered as a dose. However, one very real disadvantage of such disposable syringes resides in the fact that the dosage cost to the dairyman is unduly high.

The primary purpose in devising the present invention is to provide a disposable syringe that is not only as convenient to use as previously available plastic devices, but one that provides a lower per dose cost to the dairyman in that the cost of each syringe is prorated over four doses rather than one.

A major object of the present invention is to furnish a multiple dosage syringe that automatically indicates when a dose of predetermined volume has been dispensed therefrom, and one that in structure is but slightly more complicated than the structure of those disposable syringes employed heretofore in the administration of single doses.

Another object of the invention is to furnish a multiple dosage syringe that so operates as to impart a signal to the feel of the user that a dose of predetermined volume has been dispensed therefrom in the dark or in poorly illuminated areas.

A further object of the invention is to supply a syringe that permits multiple doses of any desired number to be discharged therefrom by simple manual operations on the part of the user.

A still further object of the invention is to provide a multiple dose syringe that lowers the per dose cost of the fluid material dispensed thereby to the extent that this mode of administration will create an ever increasing demand therefor.

Yet another object of the invention is to provide a syringe, the use of which is directed toward the dairy industry, but which is equally adapted for use in the human field, by merely replacing the used needle with a sterilized needle each time a dose is administered.

These and other objects and advantages of the inven-

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tion will become apparent from the following description of a first and certain alternate forms thereof, and from the drawing illustrating same in which:

Figure 1 is a perspective view of a first form of the invention;

Figure 2 is a fragmentary perspective view of the plunger used in the first form of the invention showing one of the dosage-indicating devices mounted thereon;

Figure 3 is a fragmentary perspective view of a second form of dosage-indicating device; and

Figure 4 is a longitudinally extending vertical cross-sectional view of a third form of dosage-indicating device shown mounted on a plunger, with the plunger slidably inserted in the barrel.

Referring to the drawing for the general arrangement of the first, second and third forms of the invention, it will be seen that each includes an elongate barrel A in which a plunger B is slidably mounted. Plunger B has a piston D mounted on one end thereof that is disposed within the confines of barrel A. When piston D is moved forwardly in barrel A by means of plunger B, fluid contained in the barrel is discharged through a suitable projecting tubular member or hollow needle C. In structure, barrel A includes an elongate tubular shell 100 that is provided with an outwardly extending ring-shaped flange 112 situated on the rearward end thereof. The forward end portion of shell 100 tapers inwardly to develop into a short tube 114, on the exterior surface of which threads are formed.

The rear end of tubular member C terminates in a nut 116 which is adapted to removably engage and be supported on the threaded tube 114. When nut 116 and tube 114 are so engaged, barrel A and member C are held together as a rigid integral unit.

The plunger B, as may best be seen in Figure 1, includes a piston 120 that is slidably mounted within the confines of shell 100, and is sufficiently long to project from the shell, even when piston 120 is at its forwardmost position therein. Plunger B (Figures 1 and 2) is defined by four normally disposed legs 124, 126, 128 and 130. The rear extremity of plunger B terminates in a transversely positioned handle 132 that is preferably in shape of an annular plate, but may take any desired configuration.

Leg 130 has a number of longitudinally spaced, downwardly extending recesses 144 formed therein, with each recessed portion being adapted to slidably receive an inverted U-shaped stop 146. Stop 146 is formed with two downwardly extending legs 148 and 150 which are connected by a web 152. Web 152 projects upwardly above leg 130 to the extent that the forward face of the web contacts flange 112 when plunger B is advanced forwardly to discharge a dose of medicament from the device. A dose of medicament can only be discharged from barrel A by removing the forwardmost stop 146 from its position on plunger B. Removal of stop 146 is a simple operation, and is achieved by merely flipping or slipping the U-shaped stop from its mounted position in the recess 144. The number of stops that are removed as the stops are advanced forwardly toward flange 112 determines the quantity of medicament that can be discharged from tubular member C.

A second form of the invention is shown in Figure 3 which differs from the first form only in the structure and design of the plunger E. Plunger E is of the same generally elongate shape as plunger B, and is formed from four normally disposed legs 124a, 126a, 128a and 130a. Leg 130a has a number of longitudinally spaced transverse bores 140 formed therein, and each bore is of such size as to snugly support a transversely positioned pin 142. Each pin 142 is sufficiently long as to extend outwardly far enough from leg 130a to permit forward

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movement of plunger E. When it is desired to discharge a dose of medicament from the invention, the forwardmost pin 142 is slidably removed from its supporting bore 140 by the use of the thumb or forefinger, and the plunger E then advanced to discharge the dose. Each pin 142 is slidably removed from the bores as above mentioned, with the number of doses of medicament discharged from tubular member C. In practice, each bore 140 may have a pin 142 removably mounted therein, or a single pin 142 can be provided which in turn is successively disposed in each bore as plunger B is advanced forwardly. It will be apparent that irrespective of whether one or a number of pins 142 are used, successive doses of predetermined volume can be discharged at will from the invention. This second form of the invention differs primarily from the first form thereof in that leg 130a can be fabricated from a rigid plastic material rather than one embodying the resilient characteristics required in the first form of the device.

A third form of the invention is shown in Figure 4. This form of the device is identical to the first form other than it includes a plunger G that is formed from four normally disposed legs 124b, 126b, 128b, and 130b. Groups of longitudinally spaced, vertically aligned slots 154 are formed in these legs, with each group of slots being adapted to removably support a resilient band 156, as shown in Figure 4. When disposed in one of the groups of slots 154, band 156 impedes forward movement of plunger G by contacting the rear face of flange 122, thus limiting the dosage dispensed to a predetermined quantity. However, when sufficient pressure is exerted on plunger G, the resilient band is displaced from slot 154 in which it is positioned and rolled back on the plunger where it assumes a position in the rearwardly disposed group of slots 154. When so disposed, band 156 impedes forward movement of plunger G and can only be displaced from the slots upon application of greater pressure to the band than that used in causing it to roll from one group of slots to the next rearward group of slots.

The operation of the first, second and third forms of the invention have been described in detail, and need not be again repeated herein. It will be apparent that the structure of the first, second and third forms of the in-

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vention can be varied, and particularly the transverse cross-section of the plunger, which may be circular or other desired configuration.

Although the forms of the invention herein shown and described are fully capable of achieving the objects and providing the advantages hereinbefore mentioned, it is to be understood that they are merely examples of the present embodiments thereof and that we do not mean to be limited to the details of construction herein shown and described other than as defined in the appended claims.

We claim:

1. A multiple dosage fluid-holding syringe, comprising: an elongate barrel; fluid discharge means mounted on one end of said barrel and in communication with the interior thereof; a piston slidably mounted in said barrel; a plunger secured to said piston and projecting outwardly from said barrel from the end thereof opposite that on which said fluid discharge means is mounted, said plunger having a plurality of longitudinally spaced, transversely positioned bores formed therein; and stop means capable of being removably supported in said bores, with said stop means being of such length as to consecutively contact the end of said barrel to limit the movement of said plunger and piston toward said discharge means until the contacting one of said stop means is manually removed from said bore in which it is disposed.

2. A multiple dosage syringe as defined in claim 1 wherein said stop means is at least one elongate member that can be manually disposed in any one of said bores.

3. A multiple dosage syringe as defined in claim 1 wherein said stop means is a plurality of elongate members mounted in said bores.

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