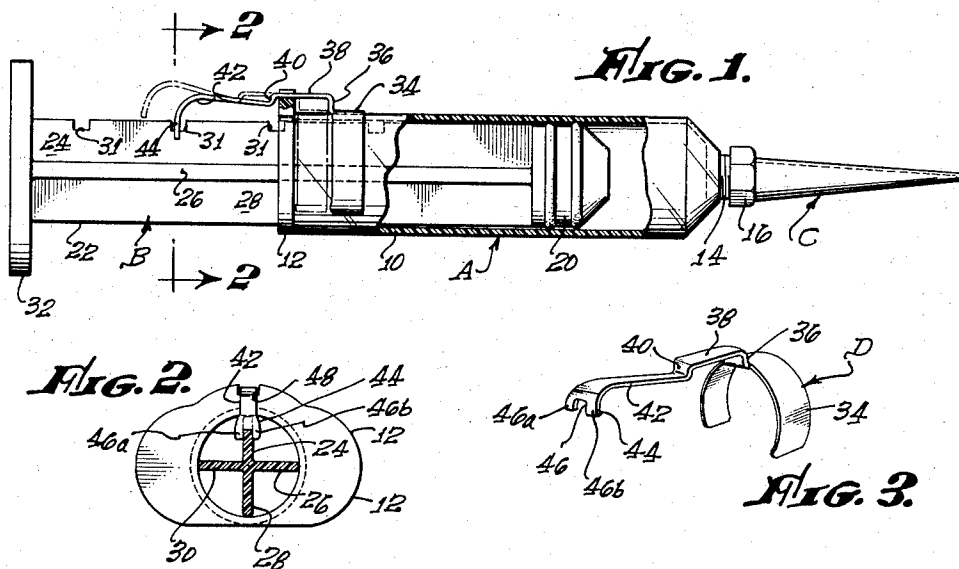


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MULTIPLE DOSAGE SYRINGE

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MULTIPLE DOSAGE SYRINGE

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The present invention relates generally to the field of 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.

This application is a continuation-in-part of our Patent No. 2,764,981, entitled "A Multiple Dosage Syringe," which issued October 2, 1956.

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 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 type above 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 than 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.

Yet another object of the invention is to provide a multiple dosage syringe that permits a dose of predetermined volume to be dispensed therefrom in the dark or in poorly illuminated areas.

A further object of the invention is to supply a syringe that permits single, double, triple or quadruple doses 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.

These and other objects and advantages of the invention will become apparent from the following description of a preferred and certain alternate forms thereof, and from the drawings illustrating same in which:

Figure 1 is a combined side elevational and vertical

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cross-sectional view of the preferred form of the invention;

Figure 2 is a vertical cross-sectional view of the device taken on line 2—2 of Figure 1; and

Figure 3 is a perspective view of the dosage control mechanism.

Referring now to the drawing for the general arrangement of the invention, it will be seen that the first form thereof as illustrated in Figures 1 and 2, includes an elongate barrel A in which a plunger B is slidably mounted, which plunger when moved inwardly causes fluid contained in the barrel to be discharged through a suitable projecting tubular member or hollow needle C. Barrel A is preferably molded as a one-piece unit from one of the numerous transparent synthetic resins commercially available for such purposes. Structurally, the barrel includes an elongate tubular shell 10 that has an outwardly extending flange 12 formed on the rearward end thereof. The forward end portion of shell 10 tapers inwardly to develop into a short tube 14 having threads formed on the exterior surface thereof.

A nut 16 is provided on the rear end of tubular member C, which nut removably engages threaded tube 14. When nut 16 and tube 14 are so engaged, barrel A and tubular member C are held together as a rigid integral unit.

As can be seen in Figure 1, plunger B includes a piston 20 that is slidably mounted within the confines of shell 10. A rigid elongate member 22 is affixed to one side of piston 20, which member is sufficiently long to project from shell 10 even when piston 20 is at its most inwardly disposed position therein. Member 22, as shown in Figure 2, has a cross-shaped transverse section defined by four normally disposed legs 24, 26, 28 and 30. The outer end of member 20 terminates in a handle 32 that is in the form of an annular plate, or other desired configuration.

Leg 24 has a number of longitudinally spaced, inwardly extending narrow recesses 31 formed therein (Figure 1). The dosage regulating device D utilized with the preferred form of the invention is shown in Figure 3. This device includes an arcuate band 34 that has a lip 36 extending upwardly from the rearward edge portion thereof, which lip develops into a rearwardly projecting web 38 that terminates in a downwardly depending stop 40. The lower edge of stop 40 develops into an upwardly and rearwardly extending elongate member 42, which on its rearward end portion turns downwardly to form a section 44. Section 44 has a centrally disposed slot 46 formed therein that is defined by two legs 46a and 46b situated on each side thereof. Regulating device D is fabricated from a resilient material and is of such size that the band 34 snugly and slidably engages the exterior surface of barrel A, as can best be seen in Figure 1.

Flange 12 has a slot 48 formed therein that is slightly wider than web 38, which as can be seen in Figures 1 and 2, is disposed within the confines of this slot. When dosage regulating device D is mounted on barrel A the elongate member 42, due to the resilience thereof, at all times tends to force section 44 downwardly relative to the leg 24. Slot 46 (Figure 2) is of such width that the upper portion of leg 24 is at all times positioned within the confines thereof. Section 44, of course, is urged by resilient member 42 downwardly into each of the recesses 31, and section 44 is disposed in vertical alignment therewith. Section 44 remains so positioned in one of the recesses 31 until it is manually removed when upward pressure is exerted on member 42, in which case, this member and section can be pivoted upwardly to the position shown in phantom line in Figure 1. When member 42 and section 44 are disposed in this upward

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position, section 44 is removed from one of the recesses 31 and plunger B can be moved forwardly.

The primary purpose of the dosage regulating device D is to insure that the plunger B will only be moved forwardly the distance between two adjoining recesses 31 to dispense a predetermined dose of medicament contained in barrel A. As an illustration of the use of the invention in dispensing a single dose of medicament from the syringe, assume that section 44 is situated in one of the recesses 31 as shown in Figure 1. In this position stop 40 abuts against the rearward exterior surface of flange 12 whereby further forward movement of plunger B is prevented. However, when it is desired to inject another predetermined dose of medicament from barrel A, the elongate member 42 and section 44 are manually lifted upwardly and then slid rearwardly relative to plunger B until they occupy the position shown in phantom line in Figure 1. It will be apparent that during this rearward movement of elongate member 42 and section 44, the band 34 of the dosage regulating device D moves concurrently therewith until the whole device has been moved rearwardly relative to barrel A until lip 36 contacts the forward face of flange 12. In this position slot 46 engages a portion of leg 24 situated between two of the recesses 31. Forward movement of plunger B positions section 44 in the next succeeding of the recesses 31. However, engagement of section 44 with the next succeeding recess 31 does not stop further forward movement of plunger B until member 34 has been slidably moved on barrel A from the position shown in phantom line in Figure 1 to that shown in solid line in the same figure. Actual stoppage of dosage regulating device D is due to the concurrent movement of the device with plunger B until a position is reached at which the stop 40 contacts the rear face of flange 12 below slot 48. Forward movement of plunger B cannot again occur until section 44 is manually withdrawn from recess 31 in which it is disposed and the dosage regulating device D is moved rearwardly on barrel A to the position shown in phantom line (Figure 1).

Although the invention herein shown and described is fully capable of achieving the objects and providing the advantages hereinbefore mentioned, it is to be understood that the forms of the invention herein shown and described are merely the presently preferred embodiments thereof and that there is no intention of limiting same to the details of construction herein shown and described other than as defined by the appended claims.

We claim:

1. A multiple dosage syringe for use in discharging doses of predetermined volume that includes: a barrel capable of containing a plurality of said doses of a liquid material; tubular means mounted on one end of said barrel through which each of said doses can be discharged from said barrel; a piston slidably mounted in said barrel; an elongate member affixed to said piston and extending

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outwardly from the end of said barrel opposite that on which said tubular means is mounted, which member has a plurality of longitudinally spaced engageable means formed thereon; and stop means that includes an arcuate band which is slidably mounted on said barrel for limited movement thereon, said stop means being capable of engaging said engageable means and limiting the movement of said piston but manually removable to a slightly withdrawn position on said elongate member ready for subsequent engagement with a following engageable means thereon during discharge movement thereof.

2. A syringe as defined in claim 1 in which said barrel has a flange formed on the end thereof opposite that on which said tubular means is mounted, which flange has a slot formed therein and a portion of said stop means is movably disposed in said slot.

3. A syringe as defined in claim 2 in which said stop means includes a resilient member disposed in said slot, which member defines a lip that limits rearward movement of said stop means relative to said barrel, said resilient member embodying a stop that limits the forward movement of said stop means relative to said barrel when said stop encounters a portion of the rearward face of said flange.

4. A syringe as defined in claim 3 in which said elongate member is of such transverse cross-section as to define a plurality of legs, said engageable means is a plurality of longitudinally spaced recesses formed in one of said legs, and said resilient member is formed with a free end section adapted to removably engage any one of said recesses when placed in alignment therewith.

5. A syringe as defined in claim 4 wherein said end section has an upwardly extending slot formed therein that is of greater width than the thickness of said leg in which said recesses are formed, said slot being defined by two laterally separated legs forming an integral part of said section, with the height of said section being sufficiently great that said resilient member is stressed when the upper extremity of said slot is in engagement with the longitudinal edge of said leg in which said recesses are formed and tends to at all times move said section in a direction to place said section in one of said recesses, with said legs movably engaging opposite side walls of said leg in which said recesses are formed to guide said section into said recesses and prevent inadvertent displacement therefrom after being so disposed.

References Cited in the file of this patent

UNITED STATES PATENTS

2,183,318	Burton	Dec. 12, 1939
2,409,656	Austin	Oct. 22, 1946

FOREIGN PATENTS

369,122	France	Oct. 31, 1906
293,302	Switzerland	Dec. 1, 1953
1,085,500	France	July 28, 1954