LIQUID MEDICINE APPLICATOR

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References Cited

UNITED STATES PATENTS

200,717 2/1878 Hartman 128/223

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ABSTRACT

A one-piece syringe formed entirely of plastic has a dosage scaled barrel provided at one end with a discharge nozzle and at the other end with a flexible, resilient, hand-compressible bulb in which its major wall portion is of less thickness than the barrel wall thickness. The bulb wall includes oppositely located finger grip areas of less thickness than the thickness of the bulb wall, whereby the finger grip areas may be indented toward each other by pinching between the thumb and forefinger of a person holding the syringe in one hand, without other support. The fluid capacity of the bulb is such that, when the finger grip areas are indented to a point at which they cannot be further depressed without beginning to collapse the major portion of the bulb, they will have displaced from the bulb a volume of fluid sufficient to discharge from the barrel an accurately measured quantity of any liquid contained therein and without collapse of the main body of the bulb itself.

7 Claims, 5 Drawing Figures
LIQUID MEDICINE APPLICATOR

BACKGROUND

Field of the Invention. The present invention relates to devices for oral injection of liquid medicines. In the pharmaceutical industry the vast majority of instructions for the administration of such medicines is couched in terms of whole or part "teaspoons" to be taken at prescribed times. In doctors' prescriptions and in instruction labels on bottled medicines, a "teaspoon" is a standard quantity of 5 cubic centimeters. Very few household teaspoons are accurate for that amount, yet the centuries old practice of pouring from a bottle into a household teaspoon a quantity of liquid medicine, which then is carried to and fed into the mouth of a person for whom it is prescribed, is still the most used method of administering doses. The pouring of a half or a quarter "teaspoon" into a conventional household teaspoon is a matter of guesswork resulting in the delivery of an amount ranging between one quarter and three quarters of a prescribed "teaspoon". In consequence, the person for whom the dose is intended will receive either less or more than the prescribed amount. For some medicines, the instant and/or cumulative deficiency or surplus could have seriously adverse effect. Furthermore, loss due to spillage in carrying and delivering militates against accuracy of dosage. In dosing young children, especially infants, and persons afflicted with the tremors of palsy, oral administration by the household teaspoon method cannot be relied upon to deliver the precise quantity prescribed.

More accurate dosage is obtainable by oral injection of a precisely measured quantity of liquid medicine from a syringe of the resilient, compressible bulb type having a hollow tubular barrel in communication at one end with the bulb interior and provided at its other end with nozzle means for discharging liquid forced from the barrel by compression of the bulb. In such syringes the barrel is usually translucent and carries external scale indicia for precise measurement of the quantity of any liquid contained therein. It is characteristic of practically all such syringes that, unless the barrel is held against lateral movement when in use, compression of the bulb imparts appreciable sideway displacement to the barrel and thereby alters the direction of the liquid stream discharging from the barrel. Syringe structure of the general type above described provides the background for the present invention.

The Prior Art most pertinent to my invention, so far as I am aware, is epitomized in U.S. Pat. No. 3,295,523 to Weisselbaum. This patent discloses a one-piece plastic syringe having a translucent, hollow, tubular barrel externally scaled and in communication at one end with the interior of a resilient, compressible bulb. The other end of the barrel terminates in an extended nozzle having a discharge passage in axial alignment with the bore of the barrel. The wall thickness of the bulb is less than the wall thickness of the barrel, thus imparting resilience and flexibility to the bulb so that it may be compressed.

However, a syringe of the type disclosed in U.S. Pat. No. 3,295,523 is susceptible to sideway at its nozzle when the bulb is compressed. Ordinarily, as when employed for dosing an ambulatory or seated adult or a child willing to accept and swallow the medicine, no problem arises in administering an accurate dose with the syringe of the aforesaid patent, because fortuitous sideway of the nozzle does not adversely affect reception and swallowing. The situation is different, however, when liquid medicine is fed into the mouth of an infant lying on its back or held in the arms of a person administering the dose. In such cases, as well as in cases of small or intransigent children who may refuse to take the dosage amount, the nozzle may be turned so as to direct nostril side of the nozzle would be directed against a side of the mouth instead of directly into the throat. Liquid thus diverted would be swallowed by involuntary reaction. If the entire syringe were supported solely from the bulb when held in one hand under the disadvantageous conditions referred to oral administration of liquid medicine might well be fraught with danger. This danger would be present even though the discharge passage through the nozzle, or the nozzle itself, be disposed at an angle to the axis of the barrel, because the sideway of the nozzle might be directed directly into the throat instead of to the side as intended. Any compressible bulb syringe type applicator known to the prior art is susceptible to fortuitous sideway because, when its bulb is squeezed, the longitudinal axis of the barrel and nozzle tip is angled and displaced relative to its position before compression of the bulb, unless the barrel is held against such deflection.

SUMMARY OF THE INVENTION

The present invention is a one-piece, plastic, compressible bulb syringe for single-handed oral administration of liquid medicines as a stream delivered into the mouth of a recipient in such direction that it cannot enter directly into the recipient's throat or lungs. The syringe comprises a compressible bulb integral with one end of a substantially non-compressible barrel which at its other end is formed as a nozzle tip provided with laterally directed discharge passages angled with respect to the longitudinal axis of the barrel. The wall thickness of the bulb is less than the wall thickness of the barrel, so that the bulb as a whole may be compressed by hand squeezing in the conventional manner of syringe operation, when desired. In the present invention, however, the thin, flexible, resilient wall of the bulb is formed with opposed, well defined, finger grip areas even thinner than the wall of the bulb in which they are located. When the syringe is in use, light pressure applied to the finger grip areas externally from opposite sides of the bulb will indent these areas and thereby force from the bulb an amount of air sufficient to expel through the discharge passages at the nozzle end of the hollow barrel the entire quantity of liquid that may be contained in the barrel at the time. In the preferred embodiment of my invention as herein disclosed, the highly flexible and very thin wall portions comprising the finger grip areas are so proportioned relative to the total wall area of the bulb that, when the finger grip areas are fully indented, they will have discharged from the bulb a volume of air sufficient to force from the barrel the entire quantity of liquid therein. By "fully indented" is meant the limit to which the finger grip areas can be pinched toward each other before encountering resistance to further movement imposed by the thicker wall of the bulb. The force required to pinch the finger grip areas to their aforesaid limit is so slight that it cannot impart sideway to the barrel. In consequence, when the syringe is to be filled for use the bulb may first be evacuated of air by hand squeezing, when, after release of compression allows liquid from a container into which the barrel tip is submerged to be sucked up into the barrel and fill it to a desired capacity as indicated by a scale on the exterior of the barrel. Then, by holding the bulb between thumb and forefinger engaging the finger grip areas, the tip of the barrel may be inserted gently into the mouth of a recipient. When the thumb and finger holding the bulb are indented toward each other under a slight pinching pressure, the exact prescribed dose of liquid medicine contained in the barrel will be discharged gently into the mouth of the recipient in such direction that it cannot accidentally be misdirected directly into the recipient's throat, because the gentle, firm, squeezing pressure of thumb and forefinger applied to the finger grip areas of the bulb is insufficient to effect tilting of the barrel.
from its initial longitudinal axis of insertion. No syringe of the prior art is capable of operation in this manner. No syringe of the prior art teaches the use of a compressible bulb which has thumb and finger engageable areas of its wall independently compressible without effecting compression of the main portion of the bulb.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation, partly in section, of a syringe embodying the present invention;

FIG. 2 is a side elevation, partly in section, of the syringe of FIG. 1 but rotated ninety degrees relative thereto, showing the areas 14 fully indented;

FIG. 3 is a sectional view on line 3—3 of FIG. 2;

FIG. 4 is a sectional view on line 4—4 of FIG. 2; and

FIG. 5 is a fragmentary elevation of the discharge nozzle end of the syringe with closure cap thereon.

DESCRIPTION OF PREFERRED EMBODIMENT

The liquid medicine applicator syringe of the present invention is a one-piece plastic unit comprising a hollow tubular barrel 10 in communication at one end with the interior of a hand-compressible bulb 11 provided with a circular flat wall portion 12 centered on the longitudinal axis of the barrel bore and disposed in a plane normal thereto. The portion 12 provides a base for seating the bulb in an upright vertical position when it is placed on a table or the like. The barrel 10 is substantially rectangular in cross section with walls sufficiently thick to resist bending and lateral compression, thus providing rigidity for the barrel so that its bore cannot be closed by biting when inserted in the mouth of a child. Scale indicia denoting a full teaspoon and fractions thereof are provided on a face of the barrel and the body of the barrel is translucent for easy reading of the scale. In the preferred form of my invention, the longitudinal bore of the barrel 10 is closed at its discharge end and delivery of liquid contained in the barrel is effected through an annular series of passages 13 in the wall of the tip portion of the barrel, directed forwardly at an angle of approximately 45 degrees relative to its longitudinal axis.

A salient feature of the present invention is the structure of the bulb, in which the major portion of its wall is of a thickness less than the thickness of the wall of the barrel, whereby the bulb as a whole is resilient and flexible so that it is compressible to the extent of substantially complete collapse under hand squeezing, yet will resume its original shape when compression force is released. The thin wall of bulb 11 is formed at diametrically opposed points with still thinner finger grip areas 14 circumskirted by an elevated rib 15 by which they are individually differentiated from the remainder of the bulb wall. These highly flexible areas 14 are positioned for engagement between a thumb and forefinger, by which they are easily indented independently of the remainder of the bulb when they are subjected to pinching pressure applied by a person holding the syringe solely by its bulb. The finger grip areas 14 are designed so that when they are indented toward each other to a point at which they cannot be further indented without beginning to pull in the adjacent portions of the thicker wall of the bulb; that is, when the areas 14 are fully indented, they will have displaced from the bulb an amount of fluid sufficient to force through the barrel discharge passages 13 all the liquid initially contained in the barrel between its tip and the scale level to which the barrel is filled; in no event more than one teaspoon. Completion of full indent movement of the finger grip areas 14 is indicated by the feel of the sudden resistance to further compression imparted by the thicker bulb wall surrounding the finger grip areas.

The tip of the barrel in which the discharge passages 13 are located constitutes a nozzle which, when the syringe is not in use, may be covered by a friction grip cap 16 as shown in FIG. 4. By charging the barrel with a prescribed dose of liquid medicine and covering the nozzle tip with the cap, the syringe, which is disposable, may be seated upright on its base 12 and stored for future use at some required time. If desired, the bulb itself could constitute the stopper for a bottle, or the barrel could be provided with a fixed or axially adjustable stopper for a bottle into which the barrel may be inserted.

I claim:

1. An oral liquid medicine applicator comprising: a one-piece body of plastic material constituted as a syringe having a hollow tubular barrel provided at one end with a flexible, resilient, hand-compressible bulb of a wall thickness less than the wall thickness of the barrel; the bulb wall including finger grip areas of less thickness than the bulb wall thickness for compression independently of the remainder of the bulb.

2. An applicator as defined in claim 1, in which the finger grip areas are located in positions for engagement between a thumb and forefinger, whereby a person using the applicator may indent the grip areas toward each other by a pinching movement to a limit position without compressing the remainder of the bulb.

3. An applicator as defined in claim 2, in which the indent limit position of the finger grip areas of the bulb wall is the point beyond which said areas of the wall cannot be further indented without effecting corresponding compression of the remainder of the bulb.

4. An applicator as defined in claim 3, in which the finger grip areas, when said limit position, displace from the bulb a quantity of fluid equal to a prescribed quantity of liquid medicine to be discharged from the barrel by compression of said finger grip areas alone.

5. An applicator as defined in claim 4, said barrel bearing scale indicia indicating a maximum volumetric capacity of one pharmaceutical standard teaspoon, and the maximum fluid displacement capacity of said finger grip areas of the bulb wall when in their indent limit position being a volume of fluid equal to one pharmaceutical standard teaspoon of liquid.

6. In the applicator of claim 1, said barrel being substantially rigid throughout its length and rectangular in cross section.

7. In the applicator defined in claim 6, the barrel having at its discharge end a plurality of liquid delivery passages each inclined at an angle from the longitudinal axis of the barrel.

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