

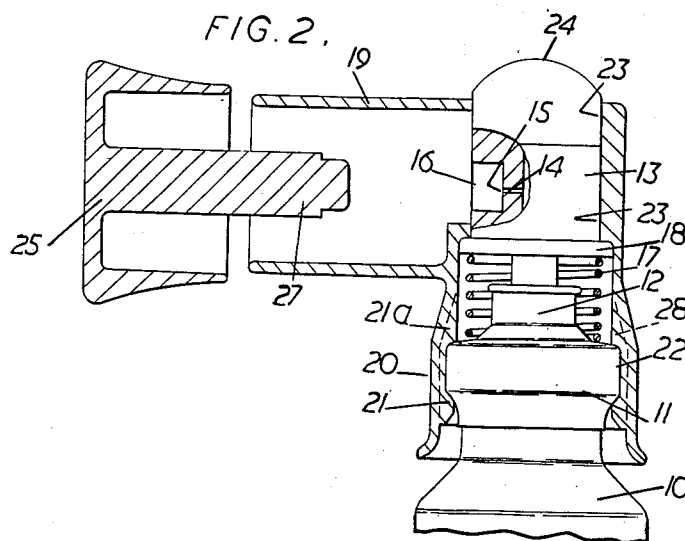
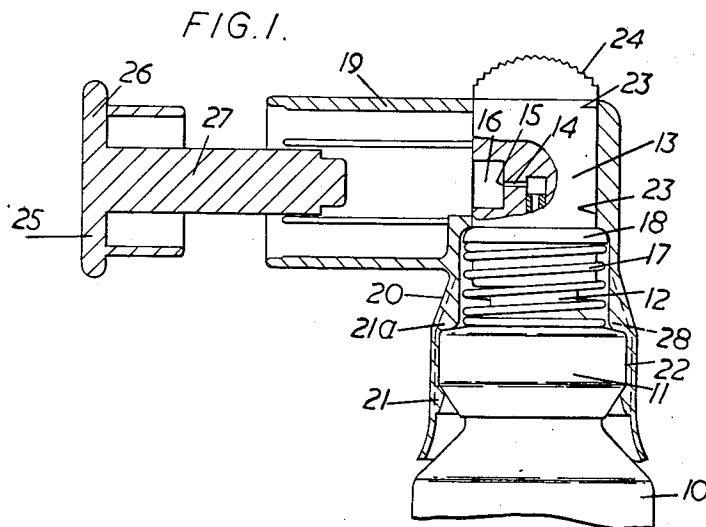
Dec. 20, 1960

G. BRIDGES

2,965,100

APPLICATORS

Filed Oct. 21, 1958



Inventor
GEORGE BRIDGES

By

Carroll R. Townsend Attorney

1

2,965,100

APPLICATORS

George Bridges, Edgware, England, assignor to Sparklets Limited, a British company

Filed Oct. 21, 1958, Ser. No. 768,139

Claims priority, application Great Britain Nov. 1, 1957

1 Claim. (Cl. 128—208)

This invention relates to applicators for use with containers for medicinal or other preparations under pressure and more particularly with valved containers adapted to deliver the preparation in a suitable form, such as a spray, or aerosol.

In certain medical conditions, for example in the treatment of chronic asthma, it has been found that the sufferer may be afforded relief by the inhalation of certain medicinal liquids in the form of a fine spray or aerosol, or of a mixture of such a spray with air. Similarly, in some afflictions of the eye and ear, the introduction of a spray of a suitable medicament into the afflicted organ has been found to be beneficial.

It has been proposed to package such liquids and similar medicinal or other preparations under gas pressure in containers fitted with a valve which on operation releases the contents of the container in a fine spray or aerosol. The valve may be a simple valve opened by movement of manual means such as a plunger or lever, the spray being delivered continuously so long as the valve remains open, or alternatively, it may be a metering valve, for example of the type described in our co-pending application No. 728,858 designed to deliver a predetermined quantity of the preparation in the form of spray at each movement of the operating means.

In order to ensure that the spray is not lost through dispersion in passage to the patient's mouth, nose, or other organ such containers are normally provided with an applicator having a delivery tube one end of which can be inserted in or against the patient's mouth or other organ and into which delivery tube the spray is released. Hitherto, such applicators have been mounted on the container in such a way that operation of the valve is effected by relative movement of the applicator and the container.

According to the present invention, an applicator for use with a valved container for dispensing a medicinal or other preparation under pressure adapted on operation of the valve to deliver the preparation as a spray, aerosol, or other suitable form, comprises a delivery tube adapted to be mounted on the container in such manner that relative movement between the delivery tube and the container in the axial direction of the container is prevented, operation of the valve being effected by movement of a plunger slidable in the applicator and having a portion projecting therefrom to provide an actuating surface.

In one form of applicator according to the invention particularly suitable for oral administration of a medicinal spray, the delivery tube is mounted on the container with its axis at any desired angle to that of the container. The plunger is mounted co-axially with the container and is arranged to slide in apertures in the walls of the delivery tube, the upper end of the plunger projecting beyond the outer wall of the delivery tube, so that the plunger can readily be moved manually to operate the valve, against the action of a spring tending to return the plunger to its original position.

2

In order to prevent the entry of foreign matter into the delivery tube, the applicator is provided with a cap fitting into or over the open end of the delivery tube, accidental operation of the valve being prevented by means of a projection carried by the cap and arranged to key with a recess in the plunger when the cap is in position.

While the present invention is particularly suitable for use with liquid medicaments, it may be applied to other liquid preparations, for example, deodorisers, and it may likewise be applied to preparations other than in liquid form, for example, in the form of powder.

The invention will now be more particularly described with reference to the accompanying drawings in which:

Figure 1 is a side view of one embodiment of the invention particularly adapted for the oral administration of medicinal sprays, the applicator and a part of the plunger being shown in section; and

Figure 2 is a similar view to Figure 1 of a modified form of the embodiment of Figure 1.

In the figures, like parts are indicated by the same reference numeral.

Referring to Figure 1, a container in the form of a bottle 10 of glass or other suitable material has a neck 11 closed by a valve housing 12. A valve (not shown) controlling the flow of fluid under pressure from the bottle 10 is housed within the housing 12 and is actuated by means of a plunger 13 mounted co-axially with the container 10, the fluid being discharged from an outlet passage 14 in the plunger 13 through an orifice 15 opening in a recess 16 in the side wall of the plunger 14. The plunger 13 is biased towards the position in which the valve is closed by a spring 17 surrounding the valve housing 12 and bearing at one end against the closure of the container 10 and at the other against a flange 18 on the plunger 13. The valve may be either of the continuous discharge type or adapted to release a metered amount of fluid from the container.

The container is provided with an applicator incorporating a delivery tube 19, closed at one end and open at the other, and provided adjacent its closed end with an annular skirt 20 depending at right angles to the axis of the tube 19. The skirt 20 is provided with an internal flange 21 arranged to be crimped or force fitted over a rim 22 formed on the neck of the container 10. The internal flange 21 in conjunction with inward projections 21a from the skirt 20 prevents any relative axial movement between the delivery tube 19 and the container 10. The walls of the tube 19 adjacent its closed end are provided with apertures 23 to receive the plunger 13 and in which the plunger is adapted to slide, the edges of the apertures 23 serving as guides for the plunger 13. The outer end of the plunger 13 projects beyond the outer wall of the tube 19 and is provided with a serrated end surface 24. Withdrawal of the plunger 13 through the apertures 23 is prevented by abutment of the flange 18 against the wall of the tube 19 surrounding the lower aperture 23.

The tube 19 is provided with a protective cap 25 arranged to be a push fit within the open end of the tube and having an external serrated flange 26 which abuts against this open end when the cap is in position. The cap is provided with an axial projection 27, of such a length and so shaped that its end fits into and keys with the recess 16 when the cap 25 is in position, thus preventing operating of the plunger. In order to prevent rotation of the plunger 13 within the apertures 23, the plunger is so shaped as to make such rotation impossible, thus ensuring that the end of the projection 27 will always engage in the recess 16. The external serrations in flange 26 allow for a better grip to be obtained and thereby facilitate the removal of the cap 25 with the fingers.

In certain applications it is desirable that the spray issuing from the orifice 15 when used for oral administration should be admixed with atmospheric air. This air is drawn into the delivery tube 19 on inhalation through flutes 28 in the skirt 20 and a space or spaces (not shown) between the outer wall of the plunger 13 and the peripheral wall of the lower aperture 23.

In operation, when it is desired to inhale the medicinal spray, the cap 25 is removed, the open end of the delivery tube 19 placed between the patient's lips or near the open mouth and the plunger 13 operated by digital pressure on and subsequent removal of pressure from the serrated surface 24, thereby operating the valve to release the required dosage at the time of inhalation. The fluid is discharged from the orifice 15 in the form of a spray into the tube 19 thence to the patient's lungs. On inhalation by the patient air is sucked in through the flutes 28 to mix with the spray in the delivery tube 19.

The embodiment of the invention shown in Figure 2 is similar in construction and operation to that of Figure 1, except that the cap 25 is arranged to fit over the open end of the delivery tube 19, the end of the tube abutting against the inner side of the end wall of the cap when the latter is in position.

I claim:

An applicator assembly for use with a valved container for dispensing a preparation under pressure in spray, aerosol, or other suitable form, comprising a hollow body portion adapted to be fixedly mounted on said container, a delivery tube extending from said body portion having an open end remote from said body portion and communicating at the other end with the interior of said body portion, a plunger slidable within said body portion to operate the valve of said container, a delivery conduit within said plunger communicating at one end with said delivery tube and at the other with the interior of said container through said valve, a recess in the wall of said plunger, and a removable cap closing the open end of said delivery tube and having a projection keyed with said recess to prevent movement of said plunger when said cap closes the open end of said delivery tube.

References Cited in the file of this patent

UNITED STATES PATENTS

2,646,192	Grovenmeyer	July 21, 1953
2,829,801	Ayres	Apr. 8, 1958