

FIG. 1

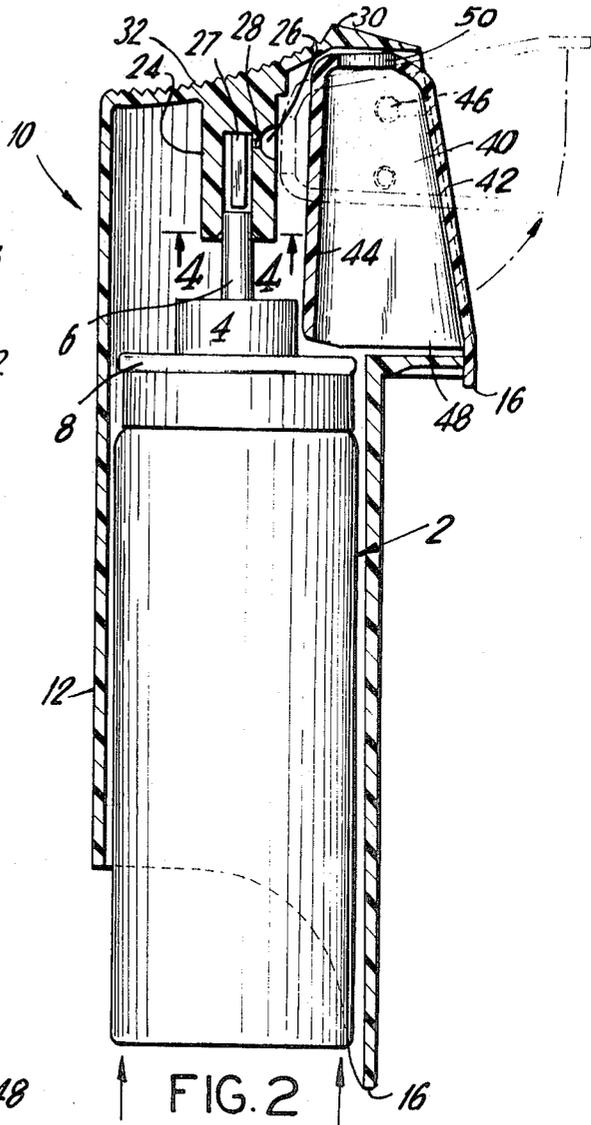


FIG. 2

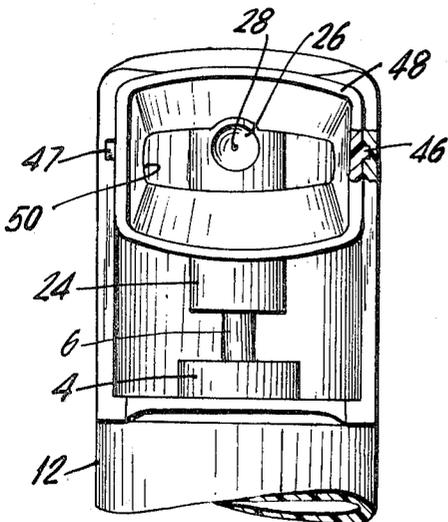


FIG. 3

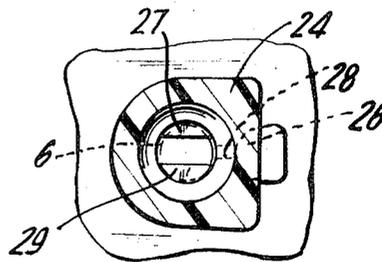


FIG. 4

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AEROSOL INHALER WITH FLIP-UP NOZZLE

This invention relates to a dispensing device for aerosol products, that is, for products that are confined under pressure within a container and dispensed therefrom in the form of a spray. More particularly, the invention relates to a dispensing device especially suited for use in the oral administration, by inhalation, of medicinal compositions.

The administration of medicinal agents by inhalation has many advantages as compared with alternate methods. Inhalation is quick and easy and may be accomplished by the patient without assistance or difficulty. In addition, response to this type of administration is prompt because of the direct application of the medicinal agent to the affected area. Prompt response and administration by the patient are of particular importance where the patient is subject to attacks, such as, for example, asthma attacks, where such attacks are unpredictable and may occur at any time.

One means found to be particularly effective in the administration of medical agents by inhalation is by packaging the medicament, as for example antibiotics, anesthetics, antiseptics, antihistamines, and the like, and combinations thereof, in a container with a propellant, such as Freon. Such container is provided with a valve which, when depressed, discharges the medicament in a mist or spray. Such containers are relatively small and can be carried in a pocketbook, purse or pocket so that, when needed, it is readily available and a portion of the contents might be easily dispensed. Thus, as an attack is coming on or during the initial stage, the required medicament may be administered by the patient and the attack lessened and relieved. The contents of the container are not dispensed at one time but, rather, over a period of time depending upon the frequency and severity of attacks. A patient may carry such a container in a pocketbook, purse or pocket for weeks and even months, before the contents of the container are exhausted.

When not in use, the medicament and propellant are maintained under pressure in the container. Just before the contents are exhausted, the spray discharged from the container decreases, indicating to the patient that a new container is required. This might occur weeks, and even months, after such container has been placed in use.

To minimize cost and, at the same time, provide a unit that is compact, may be carried in pocketbook, purse or pocket, will be readily available and easy to use, the medicament and propellant are packaged in a pressure tight container of metal or other material and the container is provided with a valve. Such container is inserted into a dispenser having a nozzle into which the container valve is inserted and, usually, the dispenser is provided with a head through which the spray, from the container, is dispensed. Such dispenser is usually purchased by the patient with the initial container of medicament and propellant. When the contents of the container are exhausted, the dispenser is removed, the exhausted container is thrown away and a new container, purchased separately, is inserted in the dispenser.

While making the dispenser and container separate units and replacing the container, when exhausted, with a new container minimizes the cost of such unit, if the dispenser and container become separated, neither unit can be used. Furthermore, when separated, such as in a purse, pocketbook or pocket, the container valve may become clogged or such valve might be accidentally opened and discharge the contents of the container.

In the dispenser of the instant invention, the nozzle and head are situated in a head at the top of the dispenser and the dispenser is provided with a skirt that extends downwardly from the head. The dispenser head is provided with a boss into which the valve stem on the container is inserted. In the illustrated embodiment, the boss frictionally grips and locks the container in the dispenser. Other locking means, such as detents, recesses, and the like, on the dispenser and container may be employed. The container is inserted in the dispenser through the open bottom of the skirt, the valve stem on the

container is aligned with the opening in the boss in the dispenser head and the stem is pushed into the boss so that the stem is frictionally gripped by the boss to hold the container in the dispenser. The dispenser skirt extends downward along the container body and one side of the skirt, at the lower end, is cutaway so that, by placing one finger on the bottom of the container, at the skirt recess, and another finger on the dispenser head, the container can be pressed into the dispenser to open the container valve and discharge a spray through the dispenser nozzle. The cutaway at the skirt bottom also allows the container, when empty, to be pulled out so that a new container can be substituted. Preferably, the skirt extends beyond the lower end of the container and is rounded so that, if the dispenser, with the container therein, is placed on a table with the valve end up, the dispenser will fall over. In this way, the possibility of drainage of the metered charge out of the metering valve is avoided.

In the dispenser of the instant invention, the nozzle hood is pivotally mounted on the dispenser head. When closed, the hood prevents dust, dirt, and the like, from entering the dispenser head thus assuring that the head, and nozzle therein, will not become dirty and clogged. When closed, the head engages the end of the container to prevent the container from being accidentally pushed into the dispenser and the valve from being accidentally opened to discharge the container contents. When opened, the hood forms, with the dispenser head, an air passage through which air can enter the dispenser head, receive the metered spray of medication and discharge the mixture of medication and air to the patient.

When inserted and locked in the dispenser, the container, except where the dispenser skirt is cutaway, is housed within the skirt. Thus, the container is protected, when in a pocketbook, purse or pocket, from being accidentally separated from the dispenser. This along with the engagement of the closed head with the container end, prevents accidental discharge and assures that, when needed by the patient, spray will be available. The flow of air into the dispenser head and the discharge thereof through the nozzle head with the metered amount of medication assures that the patient using the dispenser will receive the prescribed medication.

The invention will be more fully understood when considered with the following description and attached drawings in which:

FIG. 1 is a perspective side elevational view of the dispensing device;

FIG. 2 is a sectional view of FIG. 1 taken along line 2—2;

FIG. 3 is a sectional view of the dispenser taken along line 3—3 of FIG. 2; and

FIG. 4 is a sectional view of the valve actuator taken along line 4—4 of FIG. 2.

Referring now to the drawing, illustrating the preferred embodiment of the present invention, a conventional pressure container, generally designated 2, for the self-propelling composition, which container can be made of material such as steel, aluminum, etc., has a neck or extension 4 housing a metering valve, not shown, for dispensing the composition. The valve has a valve stem 6, with a passage therethrough, which when pushed into the container, opens the valve to discharge a metered amount of medication and, when released, permits the valve to close and recharge.

The dispenser, to which the instant invention is particularly directed, includes head portion, generally designated 10, and skirt 12, extending downward from head 10. As best shown in FIG. 1, skirt 12 is cylindrical to receive the cylindrical body of container 2 but may be of any shape to conform with the shape of the container, for example, rectangular, elliptical, etc.

At its lower end, skirt 12 is open and is cutaway at 14, to expose a portion of the container side for purposes more apparent hereinafter. Preferably, the lower end of skirt 12, where not cutaway, extends downward beyond the container end and is rounded at 16. Valve stem boss 24, having a nozzle 26 and longitudinal passageway 28, with steps 27, 29, for

receiving valve stem 6, projects downward from the top 30 of head 10. Top 30 has an indented finger engaging area 32, roughened to grip the finger, for purposes more apparent hereinafter. Nozzle 26, in boss 24, faces open side 34 of head 10 between walls 36, 38. Nozzle hood 40, having a front wall 42 and a rear wall 44, when the hood is closed, is pivotally mounted by pivot 46, 47, on hood sidewalls 49, 51. Pivots 46, 47, project into recess in walls 36, 38 of open side 34. When closed, as shown in full line FIG. 2, wall 44 is adjacent neck 4 of container 2, with the end of wall 44 above the top of container 2, for purposes more apparent hereinafter. When hood 40 is closed, wall 42 forms a closure over open side 34 of head 10. Hood 40, is open at its end 48 and has an opening 50 at its opposite end which, when the hood is open to the phantom line in FIG. 2, is aligned with nozzle 26.

Dispenser 10 may be made of any suitable material but, preferably, is molded from rigid or semirigid plastic. Container 2 is inserted through the open end of skirt 12, valve end forward, valve stem 6 is aligned with passageway 28 and the container is pushed into the dispenser. With hood 40 closed, at the top of the container abuts the end of hood wall 44, and prevents the container from being moved further into the dispenser to open the valve and discharge the container contents.

With container 2 in the dispenser and locked therein, container 2 and the dispenser cannot become accidentally separated. Skirt 12, extending downward along the container, prevents container 2 from being jarred or displaced, relative to the dispenser. Furthermore, the end of the skirt and the end of hood wall 44 prevent container 2 from being pushed into the dispenser to open the container valve.

When the patient requires the medicament, the dispenser, with the container therein, is withdrawn from the pocketbook, purse or pocket, and hood 40 is flipped open to the phantom line of FIG. 2. The patient can then place one finger in recess 32 on the top of head 10 and another finger on the bottom of the container at cutaway 14 in skirt 12 and, by pushing the container into the dispenser, open the valve and discharge a metered amount of spray through nozzle 26 and into the air moving through hood opening 50 and the open end of hood 40. After treatment, the patient can reclose hood 40 and returns the dispenser, with the container therein, to the patient's pocketbook, purse, pocket or wherever else the patient might select to carry the dispenser until use is again required.

As best shown in FIG. 2, when closed, wall 42 of hood 40 forms a closure over open side 34 of dispenser hood 10 but, when open, hood 40 occupies only the upper portion of open side 34. Thus, below hood 40, with hood 40 open, air can pass into head 10 of the dispenser.

When the patient requires the medicament, withdraws the dispense from the pocketbook, purse or pocket and flips open hood 40, the patient places the open end of hood 40 close to the mouth and, while pushing the container into the dispenser, inhales. Inhaling is, of course, necessary to the administration of the medicament. Such inhaling draws air out of the open end of hood 40 and causes air to enter dispensing head 10 through open side 34 below the open hood. Thus, the air flows into head 10 under the open hood and through hood opening 50 into hood 40. As such air flows past nozzle 26 and through opening 50 into hood 40, the medicament, sprayed through nozzle 26, mixes with the air and is discharged through the forward open end of hood 40. Open end 48 of hood 40 is in or relatively close to the patient's mouth. Because the top, bottom and side of hood 40 are closed, and open end 48 of hood 40 is in or in close proximity to the patient's mouth, little, if any, of the medicament is lost to the atmosphere irrespective

of whether the dispenser is used indoors or out of doors. This is of particular importance to administration of the medication.

After the contents of the container are exhausted, which may be weeks or months after a full container is inserted into the dispenser, depending on frequency of use by the patient, the end of the empty container is grasp by finger at cutout 14 and, while holding the dispenser, container 2 is pulled out of the dispenser. The empty container is thrown away and a new container is inserted through the open end of skirt 12 and pushed into the dispenser. Empty containers can be removed and new container can be inserted in the container any number of times.

The terms and expressions which have been employed are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of the features shown and described or portions thereof, but it is recognized that various modifications are possible.

What is claimed is:

1. A dispenser for dispensing a composition confined under pressure in a container having metering valve means including a stem portion projecting from the top of the container which stem portion, when pushed toward the container, opens said valve for dispensing metered amount of the composition under pressure therein and, when released, closes said valve, said container having a body portion extending downward from said valve, said dispenser comprising a housing having a skirt portion extending downward for receiving and housing a container inserted therein and a dispensing head having a boss therein for engaging the stem portion of the metering valve means of such container, a nozzle in said boss, said dispensing head having an opening in one side thereof, a hood mounted in said opening in said head for pivotal movement between an open position and a close position, means on said hood for engaging the end of a container when said hood is closed for preventing said container from being pushed into said dispenser to open said valve means, an outer wall on said hood for forming a closure over said opening when said hood is closed, an inner wall on said hood, said hood, when open, having an opening in the rear wall thereof in alignment with said nozzle in said boss and a front, open wall, said hood, when open, forming a closed passageway between said opening in alignment with said nozzle and said open end of said hood for the passage of air drawn through said opening in said one side of said dispensing head and discharged through the open end of said hood with a metered amount of the composition sprayed into said hood through said nozzle, said inner wall of said hood, when said hood is opened, forming a divider between the air drawn into said dispensing hood opening and said air discharged through the open end of said hood with said metered amount of the composition sprayed.

2. A dispenser, as recited in claim 1, in which said means on said hood for engaging the end of a container is said inner wall of said hood when said hood is closed.

3. A dispenser, as recited in claim 1, in which said skirt portion extends downward beyond the end of a container inserted therein.

4. A dispenser, as recited in claim 3, in which said skirt portion extending downward beyond the end of a container inserted therein is cutaway at one side of its lower end for exposing the bottom and a portion of one side of the container.

5. A dispenser, as recited in claim 4, in which the bottom of said skirt portion extending downward beyond the end of the container is rounded.

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