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2,672,865

INHALER FOR MEDICINAL SUBSTANCES

Filed April 27, 1951

FIG. 1

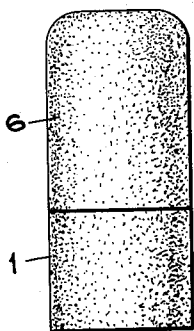


FIG. 2

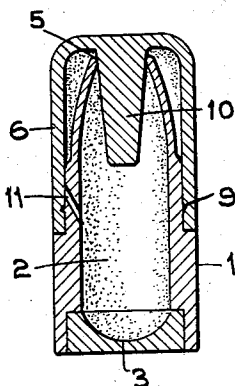


FIG. 3

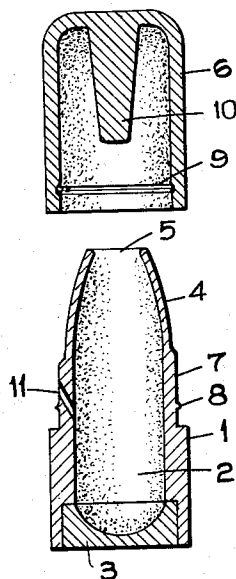


FIG. 4

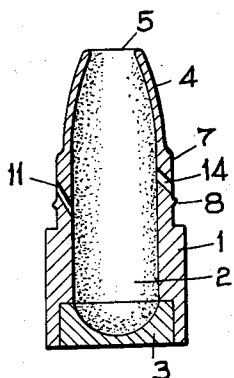
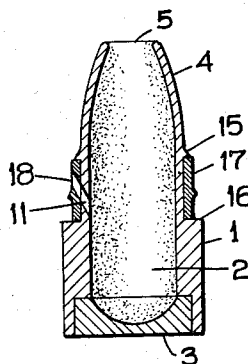


FIG. 5



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UNITED STATES PATENT OFFICE

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3 Claims. (Cl. 128—206)

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This invention relates to an inhaler for medicinal substances.

When inhaling medicinal substances either through the nose or the mouth it is desirable to effect a very fine discharge of the material being inhaled.

Where the material is a substance such as powdered penicillin certain difficulties present themselves the chief of which is the inability with inhalers as constructed heretofore of maintaining simplicity of construction while achieving a fine discharge of the powder.

According to this invention the inhaler comprises a body provided at one end with an extension having an outlet at its end which can be engaged on a nostril or placed against or into the mouth, air inlet means being located through another part of the container and so arranged that when suction is applied to the outlet the reduction of pressure within the container will cause air to flow into same to cause small quantities of the powder to be lifted in dust form and thus placed into a condition where they can be readily inhaled through the outlet.

The device is preferably provided with a sealing cap which may conveniently be of mushroom shape having a central plug which passes down and through the outlet so that it will be sealed when the plug is in use but the plug will serve to clear the outlet as it is removed, the outwardly extending portions of the cap fitting over the projection through which the outlet is formed and having their lower periphery in contact with the air inlet or inlets through which the fine jets of air are drawn when the device is in use.

This unit will be found to be of simple construction and highly hygienic for the reason that the cap normally protects the portion placed into contact with the nostril or the mouth while at the same time loss of the content or contamination of same will be prevented by the seal which the plug effects both of the outlet and the fine jet openings.

In order, however, that the invention may be more clearly understood it will now be described with reference to the accompanying drawings in which:

Fig. 1 is a side elevation of the invention,

Fig. 2 is a central longitudinal section,

Fig. 3 is a view corresponding to Fig. 2 but showing the cap removed from the body,

Fig. 4 is a central longitudinal section of a modified form of body, and

Fig. 5 is a longitudinal section of a still further modification.

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The body 1 has a hollow 2 in which the powder to be inhaled is disposed, the body being closed at its lower end by a plug 3 and having an extension 4 curved inwardly to terminate in an outlet 5 through which the inhaling takes place.

Fitting over the body 1 is a cap 6 the lower end of which engages a portion 7 on the body, the portion 7 having a circumferential ridge 8 which co-operates with a depression 9 in the cap 6 to effect a spring lock of the cap 6 to the body 1.

The cap 6 has in it a depending plug 10 which fits into the outlet 5 at the top of the body 1 to seal this outlet as shown more particularly in Fig. 2.

An air inlet opening 11, substantially smaller than the outlet 5 and having a diameter no larger than one-quarter the diameter of the outlet, is formed through the portion 7 of the body 1 and is arranged to direct air downwardly into the powder space of the body so that when suction is applied through the outlet 5 the air flowing in through the air inlet opening 11 will disturb the powder either by direct contact or by reflex currents of air set up in the container to cause the powder to be lifted with an upward flow of air taking place within the body 1.

In the modification shown in Fig. 4, in which similar reference numerals are used to corresponding parts, a further air inlet opening 14 is formed through the portion 7 of the body 1, this air inlet opening, however, being arranged as an additional air bleed to permit a greater quantity of air to be drawn through the outlet 5 in the extension 4 of the body 1.

By providing the two openings 11 and 14 a close control is given of the mixture of air and powder, the opening 11 projecting a stream of air downwardly to disturb the powder and render at least some of it air-borne while the opening 14 admits additional air so that the ratio of air to powder being drawn through the outlet 5 gives more air for a measured quantity of powder and thus allows the powder to be carried deep into the lungs or further back into the throat if such is desired. When the small opening 11 only is used it will be appreciated that the amount of air flowing through the outlet 5 will be correspondingly small and the powder will settle in the nostrils or mouth more readily than is the case where a relatively large volume of air is being inhaled.

In the modification shown in Fig. 5 of which again the corresponding parts have similar reference characters, the body 1 is provided with a shoulder 15 between which and the shoulder 16

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of the body is disposed a rotatable sleeve 17, the sleeve having an opening 18 which may register with the opening 11 in the body or may be brought into partial register only if such is desired, this then permitting the size of the opening 11 to be adjusted by appropriately orientating the sleeve 17.

In use the cap 6 is simply removed from the body 1 and the outlet 5 placed into communication with the mouth or nostril whereupon when suction is applied the powder from the hollow 2 will be drawn up with the air depending in volume on the size of the opening 11 and whether or not the additional opening 14 is used. When inhaling is completed the cap is simply replaced until such time as a further supply of the inhalant is required, the cap fitting over the portion 7 of the body in the case of Figs. 1 to 4 or over the sleeve 17 in the case of Fig. 5 to seal the air openings into the body so that when the cap is in position it closes the outlet 5 and at the same time the air inlet openings 11 and 14 if used so that a hygienic and aseptic seal is formed for the container.

The unit can be formed of plastic or any other suitable material and it will be appreciated that the openings may be duplicated if desired and may be arranged tangentially.

What I claim is:

1. An inhaler for medicinal inhalants comprising a hollow body for holding a medicinal inhalant and having an axial extension tapering to an unobstructed outlet opening arranged axially at its end, and intermediate its ends said body having at least one straight air inlet opening

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extending obliquely through the wall of said body which has a diameter no greater than one-quarter the diameter of said outlet opening and arranged to admit air into said hollow body in a direction away from said outlet opening when suction is applied to the latter, a cap to engage said body intermediate the ends of the latter and fit over said extension for sealing said inlet opening, and a stopper projecting axially within said cap to extend through and seal said outlet opening.

2. An inhaler according to claim 1; wherein said body has an additional straight air inlet opening extending obliquely through the side wall thereof intermediate its ends and arranged to admit additional air into said hollow body in the direction towards said outlet opening so that the additional air will be mixed with the medicinal mist formed by air entering through the first mentioned inlet opening.

3. An inhaler according to claim 1; including an apertured sleeve movable on said body for selective registration with said air inlet opening to vary the effective area of the latter.

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