

AN INHALER

The present invention relates to an inhaler for inhaling and applying medicinal substances and the like.

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BACKGROUND

Inhalers are used for the relief of nasal congestion or simply for refreshing inhalation. Medicated formulas are generally used as the inhaling substance, or inhalant, and primarily contain methanol and essential oils. A wick saturated with the inhalant is permanently enclosed within a dome-ended inhaler housing, or nozzle, and a variant of the inhaler is to mount the nozzle on a cartridge that is functionally separate from the nozzle. The cartridge serves only as a container to hold the inhalant.

The limitations associated with known inhalers such as those described above is that the wick is not always fully saturated resulting in inhalation of a progressively weaker inhalant. Also, since the wick is inaccessible for refilling, the entire inhaler has to be discarded once the wick dries up.

With the present invention it is intended to provide a means of directly applying the inhalant in a controlled manner and prolong the useful life of the inhaler. Further, the medication can be dabbed on or applied directly to give a stronger effect than through inhalation from the nozzle. This provides a convenient three-in-one application from a single device.

SUMMARY OF THE INVENTION

According to the present invention there is provided an inhaler including:
a cartridge for storing inhalant, the cartridge

having an opening to dispense the inhalant;

an applicator detachably connected to the cartridge, the applicator including inhalant retention means; and

5 a nozzle detachably connected to the applicator; whereby removal of the nozzle from the applicator exposes the retention means which provides accessibility to saturate the retention means with inhalant from the cartridge and allows direct application of inhalant with
10 the applicator, and wherein inhalant from the retention means can be inhaled through the nozzle when the nozzle is connected to the applicator.

The applicator can freely rotate on the cartridge to easily
15 and correctly align the cartridge and applicator during manufacturing.

The retention means is preferably a sponge and more preferably, a sponge of cosmetic or medical grade.

20 The applicator is preferably attached to the cartridge at the opening.

Preferably, the opening in the cartridge is sealed prior to
25 first use and is unsealed by means of a piercing spike on the applicator. The piercing spike also functions as a plug for the opening once it is unsealed.

Before first use it is preferable that an O-ring be
30 disposed between the cartridge and applicator to separate the cartridge and applicator to prevent inadvertent piercing of the sealed opening.

Preferably, the nozzle is provided with apertures through
35 which the inhalant is inhaled.

BRIEF DESCRIPTIONS OF THE DRAWINGS

An embodiment, incorporating all aspects of the invention, will now be described by way of example only with reference to the accompanying drawings in which:

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Figure 1 is a perspective view of a preferred embodiment of the invention;

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Figure 2(a) is a sectional view along line A-A in figure 1 of a first arrangement of the invention illustrating the cartridge;

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Figure 2(b) is a sectional view along line A-A in figure 1 of a second arrangement of the invention illustrating the applicator in connection with the cartridge;

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Figure 2(c) is a sectional view along line A-A in figure 1 of a third arrangement of the invention illustrating the nozzle in connection with the applicator and cartridge; and

Figure 3 is an exploded perspective view of the preferred embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

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The inhaler 10 of the present invention in its preferred embodiment is illustrated in figures 1 and 3 and includes a cylindrical cartridge 11 forming the base of the inhaler. The cartridge stores the inhaling substance, that is, the inhalant, which dispenses from the cartridge out of a regulated drip opening 12 located centrally at one end of the cartridge 11. An applicator 13 is screwed to the end of the cartridge having the opening and includes retention means 14 to retain inhalant. In the preferred embodiment the inhalant retention means is a sponge. The applicator can be used to directly apply inhalant to a surface in smaller and less concentrated quantities than direct

application from the cartridge. A nozzle 15 is disposed over the sponge and detachably connects with the applicator. The applicator is also the source of inhalant vapours, that is, vapours from the sponge are inhaled through the nozzle. A cap 17 is adapted to cover the nozzle and provides the inhaler with a compact appearance. The entire inhaler, with the exception of the sponge, is made of plastics.

10 Figure 2(a) illustrates a first user arrangement of the inhaler wherein the cartridge 11 containing inhalant can be used for direct concentrated application of the inhalant. The end wall 20 of the cylindrical cartridge in which the central opening 12 is formed is made of a softer plastic than the rest of the cartridge. Prior to first use of the inhaler, the central opening in the soft plastic end wall is sealed with a thin piercable layer 21 of the soft plastic. To unseal the opening the plastic seal is punctured with a piercing spike 29 located on the underside of the applicator 13.

Figure 2(b) illustrates a second user arrangement wherein the applicator is used to directly apply inhalant by dabbing the inhalant saturated sponge on to a surface. The concentration of the inhalant applied with the applicator is less than application with the cartridge. The applicator 13 is screw fitted onto the cartridge at the end which has the opening 12. An external thread 22 at this end of the cartridge engages with an internal thread 23 on an annular skirt 24 of the applicator 13. At the other end of the annular skirt is a stepped section 25 defining an annular shoulder 26 and a reduced annular section 27 in coaxial alignment with the annular skirt 24. The upper end of the annular skirt is closed by the reduced annular section 27. The piercing spike 29 depends centrally from the reduced section 27 and points towards the central opening 12. Above the annular reduced section

27 is an upright hollow rectangular sponge holder 30 with an upper opening 31 in which to insert a sponge 14. Longitudinal ridges 32 along the interior walls of the sponge holder ensure the inserted sponge is gripped in place. The sponge preferably has a high liquid retention. The annular skirt, spike, reduced annular section and sponge holder are moulded as a single component.

To puncture the sealed opening 12 in the cartridge, the spike 29 moves downwardly towards the sealed opening as the applicator is screwed onto the cartridge. The length of the spike is such that when the applicator is fully screwed onto the cartridge the spike pierces the sealed layer and protrudes into the opening. Thereafter, inhalant can be dispensed from the cartridge through the opening and directly applied to tissues, skin or the like. Moreover, the inhalant is directly applied to and saturates the sponge on the applicator. To do this the applicator is first unscrewed and separated from the cartridge. Inhalant is dispensed from the cartridge by lightly tapping the cartridge. Since the whole upper part of the sponge is exposed and accessible, it is easy to saturate the sponge with inhalant. The upper part of the sponge is the most important in terms of close proximity to the nasal region during inhalation. The present inhaler ensures the upper part is fully saturated so as to deliver strong and effective vapours. Consequently, the inhaler has a longer useful life than conventional inhalers.

Once the sponge on the applicator has been saturated with inhalant the applicator is screwed back onto the cartridge with the spike then functioning as a plug for the opening to prevent leakage of the inhalant. There is thus no direct access of inhalant to the sponge through the applicator while the applicator and cartridge are connected.

To prevent inadvertent piercing of the sealed opening prior to first use, an O-ring 35 is disposed between the applicator 13 and cartridge 11. The O-ring rests on a seat 36 on the cartridge circumventing the external thread 22.

- 5 As the applicator is screwed onto the cartridge full engagement is not possible because the bottom annular edge 37 of the skirt of the applicator contacts the O-ring 35 and cannot be rotated on the external thread any further. Once the sealed opening in the cartridge has been pierced
10 the O-ring no longer has any use and is discarded.

- Figure 2(c) illustrates a third user arrangement wherein the nozzle 15 is fitted over the applicator 13 to provide a comfortable means for inhaling inhalant vapours. The
15 nozzle has an annular flange 40 which forms a press fit with the annular shoulder 26 on the applicator 13. Projecting upwardly from the annual flange is a hollow cylindrical portion 41. The top end of the hollow portion 41 smoothly curves inwardly to partly close the upper end
20 thereof but leaving a central circular aperture 16. Other circular apertures 16, in this embodiment four, are provided circumferentially on the wall of the hollow portion 41. In use, when the nozzle is fitted on the applicator, the sponge 14 and sponge holder 30 of the
25 applicator extend upwardly into the hollow portion so that the nozzle encloses the sponge. The apertures 16 on the nozzle 15 allow vapour from the saturated sponge to be inhaled through the nozzle.

- 30 An external screw thread 42 on the hollow portion and above the annual flange 40 engages with an internal thread (not shown) on the inhaler cap 17. The inhaler cap is simply a cylindrical wall closed at the non-threaded upper end.

- 35 In summary, the inhaler has three separate arrangements for administering the inhalant. Beginning with the full assembly as illustrated in figures 1 and 3, the cap is

unscrewed and removed so the inhaler can be used as a regular nasal inhaler. The nozzle is further removed (for ease the nozzle is kept in engagement with the cap) exposing the saturated sponge which can be dabbed onto skin, etc and easily re-saturated. Lastly, the applicator is unscrewed from the cartridge (for ease the applicator is attached to the nozzle and cap assembly) thus exposing the regulated opening of the cartridge which can be used to directly dispense inhalant by lightly tapping the cartridge. The concentration of inhalant delivered from the cartridge is considerably higher than the inhalant applied with the applicator sponge.

The sponge is pre-soaked at the point of manufacture to ensure that vapour is available for inhalation upon first use. The sponge is kept saturated by repeatedly priming the sponge by dispensing inhalant from the cartridge.

It is intended that a cartridge refill assembly be available to replace an empty inhaler cartridge. Specifically, a cartridge is provided in threaded engagement with an inhaler cap. The inhaler cap is the same inhaler cap that is fitted over the nozzle. Thus, the internal threads of the inhaler cap which correspond to the external threads on the nozzle must also correspond to the external threads on the cartridge. The opening in the refill cartridge is initially sealed but is easily punctured by tightly screwing the applicator with the spike onto to the refill cartridge.

The advantages of the present inhaler over known inhalers is that the inhalant retention means is accessible so that it can be properly saturated with inhalant from the cartridge. Moreover, the present inhaler provides three different means of applying inhalant: direct application with the cartridge; direct application with the applicator; and inhalation of the inhalant from the applicator through

the nozzle.

The inhaler is also re-usable, that is, the cartridge can be replaced because it is sealed before first use. If the cartridge was not sealed, it would leak inhalant and be unsuitable for transportation and storage as a separate re-usable component. Further, in use inhalant is not wasted through leakage because the spike on the underside of the applicator plugs the opening in the cartridge. In addition, the cartridge can hold different types of inhalant solution and the consumer need only to change the cartridge instead of the entire inhaler.

It will be understood to persons skilled in the art of the invention that many modifications may be made without departing from the spirit and scope of the invention.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An inhaler (10) including:
a cartridge (11) for storing inhalant, the
5 cartridge having an opening (12) to dispense the inhalant;
an inhalant retention means (14); and
a nozzle (15);
characterised in that an applicator (13) is
detachably connected to the cartridge (11) and includes the
10 inhalant retention means (14), and the nozzle is detachably
connected to the applicator whereby removal of the nozzle
(15) from the applicator exposes the retention means (14)
which provides accessibility to saturate the retention
means (14) with inhalant from the cartridge (11) and allows
15 direct application of inhalant with the applicator (13),
and wherein inhalant from the retention means (14) can be
inhaled through the nozzle (15) when the nozzle (15) is
connected to the applicator (13).
- 20 2. The inhaler defined in claim 1 characterised in
that the retention means (14) is a sponge mounted on an
upper side of the applicator (13).
3. The inhaler defined in any one of the preceding
25 claims characterised in that the applicator (13) is screwed
on to the cartridge (11) at the opening (12).
4. The inhaler defined in any one of the preceding
claims characterised in that the opening in the cartridge
30 (11) has a seal (21).
5. The inhaler defined in claim 4 characterised in
that a downwardly directed spike (29) on an underside of
the applicator (13) pierces the seal (21) when the
35 applicator and cartridge are connected.
6. The inhaler defined in claim 5 characterised in

that when the applicator (13) and cartridge (11) are connected during use the spike (29) inserts into the opening (12) and acts as a stopper.

5 7. The inhaler defined in claims 5 or 6 characterised in that a spacer (35) is disposed between the cartridge (11) and the applicator (13) before use to prevent inadvertent piercing of the seal (21) by the spike (29).

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8. The inhaler defined in any one of the preceding claims characterised in that the nozzle (15) is provided with a plurality of apertures (16) through which the inhalant is inhaled.

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9. An inhaler defined in any one of the preceding claims characterised in that a cap (17) detachably connects to and covers the nozzle (15).

20 10. An inhaler defined in any one of the preceding claims characterised in that the cartridge (11), applicator (13), nozzle (15) and cap (17) are moulded in plastics.

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