The main embodiments of My Earlier Breath Actuated, Kink Valve Dispenser included a piston acted on by a differential breath induced pressure. The resultant force generated is generally sufficient to operate the dispenser by drawing the piston towards the dispenser's mouthpiece and extending and opening the kink valve. Nevertheless, I feel that the dispenser is susceptible of some improvement.

The object of the present invention is to provide improved breath actuated, kink valve dispensers.

According to one aspect of the invention I provide a dispenser for a gaseous, gas borne or droplet substance contained in a source thereof, the dispenser comprising:

- a body with a mouthpiece;
- a rigid connection between the body and the source;
- a substance junction movably arranged in the body for the substance outlet;
- a breath actuatable mechanism for controlling the dispensing of the gas or liquid containing or comprising the substance from the substance outlet to the mouthpiece,
    - the mechanism being adapted to receive a dose from the source prior to inhalation and retain it for release on inhalation by breath actuation; and
- a cocking lever which is a pivoted mouthpiece cover for cocking the breath actuatable mechanism for its receipt of the dose.

In the preferred embodiment, the breath actuatable mechanism is a breath actuatable valve and the cocking lever is arranged to cock the valve and depress the substance outlet, conveniently via depression of the substance junction, for release of the substance to the valve, the breath actuatable valve having:

- an inlet connected to the junction,
- a valve closure for retaining released substance prior to breath actuation and
- an outlet for directing the substance to the mouthpiece for inhalation.

According to another aspect of the invention there is provided a dispenser for a gaseous, gas borne or droplet substance contained in a source thereof, the dispenser including:

- a body with a mouthpiece;
- a junction member in the body for the substance source; and
- a breath actuatable mechanism, the mechanism being adapted to receive a dose from the source prior to inhalation and retain it for release on inhalation by breath actuation;
    - a flexible tube for receiving the said gas or liquid, the tube extending from a valve inlet connected to the junction member and having a portion which is kinkable for closure of the valve and movable to an open position in which the tube is un-kinked for opening of the valve; and
    - a member arranged for movement in the body by inhalation to un-kink the valve;
- the tube being kinked to an obturating extent when the movable member is in a ready position and un-kinked when the movable member is moved on inhalation for release of the gas or liquid;
- a spray nozzle at the end of the flexible tube which is directed in accordance with the angle of the moveable member;

wherein the dispenser also includes:

- means for locating the source in the body with the junction member being slidable towards it and
- means to cock the breath actuatable valve to a condition in which the movable member is moved to the ready position, the cocking means including:
    - a cocking lever pivotally mounted on the body and operatively connected to the movable member.

Preferably:

- the movable member is or includes a flap arranged in the body for action of breath on it on inhalation;
- the junction member, the flexible tube and the movable flap are a single injection moulding of plastics material; and
- the movable flap is pivotally connected to the junction member.

Claims:

1. A dispenser for a gaseous, gas borne or droplet substance contained in a source thereof having an outlet movable for release of the substance, the dispenser comprising:

- a body with a mouthpiece;
- a rigid connection between the body and the source;
- a substance junction movably arranged in the body for the substance outlet;
- a breath actuatable mechanism for controlling the dispensing of the gas or liquid containing or comprising the substance from the substance outlet to the mouthpiece,
    - the mechanism being adapted to receive a dose from the source prior to inhalation and retain it for release on inhalation by breath actuation; and
- a cocking lever which is a pivoted mouthpiece cover for cocking the breath actuatable mechanism for its receipt of the dose.

2. A dispenser as claimed in claim 1, wherein the breath actuatable mechanism is a breath actuatable valve and the cocking lever is arranged to cock the valve and depress the substance outlet, by depression of the substance junction, for release of the substance to the valve, the breath actuatable valve having:

- an inlet connected to the junction,
- a valve closure for retaining released substance prior to breath actuation and
- an outlet for directing the substance to the mouthpiece for inhalation.

3. A dispenser for a gaseous, gas borne or droplet substance contained in a source thereof, the dispenser including:

- a body with a mouthpiece;
- a junction member in the body for the substance source; and
- a breath actuatable mechanism, the mechanism being adapted to receive a dose from the source prior to inhalation and retain it for release on inhalation by breath actuation;
    - a flexible tube for receiving the said gas or liquid, the tube extending from a valve inlet connected to the junction member and having a portion which is kinkable for closure of the valve and movable to an open position in which the tube is un-kinked for opening of the valve; and
    - a member arranged for movement in the body by inhalation to un-kink the valve;
- the tube being kinked to an obturating extent when the movable member is in a ready position and un-kinked when the movable member is moved on inhalation for release of the gas or liquid;

- a spray nozzle at the end of the flexible tube which is directed in accordance with the angle of the moveable member;

wherein the dispenser also includes:

- means for locating the source in the body with the junction member being slidable towards it and
- means to cock the breath actuatable valve to a condition in which the movable member is moved to the ready position, the cocking means including:
    - a cocking lever pivotally mounted on the body and operatively connected to the movable member.

4. A dispenser as claimed in claim 3, wherein:

- the movable member is or includes a flap arranged in the body for action of breath on it on inhalation;
- the junction member, the flexible tube and the movable flap are a single injection moulding of plastics material; and
- the movable flap is pivotally connected to the junction member.

5. A dispenser as claimed in claim 4, wherein the movable flap is pivotally connected to the junction member by a living hinge which is an integral part of the single injection moulding.

6. A dispenser as claimed in claim 4 or claim 5, wherein:

- the junction member is slidably mounted in the body for movement in a direction for dispensing a dose of the substance from the source and
- the dispenser includes:
    - means for pivoting the flap to its ready position on or prior to initial movement of the junction member and
    - junction member resilient means for returning the junction member after release of the dose.

7. A dispenser as claimed in claim 4, claim 5 or claim 6, wherein the dispenser includes means to hold the flap in its ready position prior to inhalation movement to un-kink the valve.

8. A dispenser as claimed in claim 7, wherein the flap holding means is an over-centre mechanism.

9. A dispenser as claimed in claim 8, wherein the over-centre mechanism comprises a lug and a spring, both integrally moulded with the said single injection moulding, one with the junction member and the other with the flap.

10. A dispenser as claimed in claim 9, wherein the lug is integrally moulded with the flap for pivotal movement with it about the living hinge and the spring is integrally moulded with the junction member.

11. A dispenser as claimed in claim 10, wherein the spring is a leaf spring normally urging the flap to an open position of the valve and urging the flap to its ready position when passed over-centre to this position.

12. A dispenser as claimed in any one of claims 4 to 11, wherein the single injection moulding is provided with formations guiding it for movement in the body.

13. A dispenser as claimed in any one of claims 4 to 11, wherein the single injection moulding is mounted in a carrier provided with formations guiding it for movement in the body.

14. A dispenser as claimed in claim 6 or any one of claims 7 to 13 as appendant to claim 6, wherein:

- the junction member resilient means is a spring in the source and
- the dispenser includes:
    - means for locating the source in the body with the junction member being slidable towards it and
    - means for displacing the junction member towards the source for dispensing the dose into the kinked tube.

15. A dispenser as claimed in any preceding claim, wherein the cocking lever is a cover for the mouthpiece prior to dispensing of a dose from the source, a dose being dispensed to the kink valve on opening of the cover.

16. A dispenser as claimed in any preceding claim, wherein the cocking lever incorporates a main cam comprising the motion conversion mechanism in co-operation with the junction member and/or the carrier where provided.

17. A dispenser as claimed in claim 4 or any one of claims 5 to 16 as appendant to claim 5, wherein means for pivoting the flap is a secondary cam mechanism acting between the cocking lever and the flap.

18. A dispenser as claimed in claim 17, wherein the secondary cam mechanism comprises a finger on the cam of the cocking lever and a finger on the flap, the fingers engaging as the cocking lever is opened to move the flap to its ready position.

19. A dispenser as claimed in claim 18, wherein the fingers are shaped to deflect away from each other on return movement of the cocking lever, with the flap in its position corresponding to the valve being open.

20. A dispenser as claimed in any one of claims 16 to 19, including a tertiary cam mechanism for returning the flap to its valve open position on return movement of the cocking lever.

21. A dispenser as claimed in claim 20, wherein the tertiary cam mechanism comprises a finger on the cocking lever and a finger on the flap, the fingers engaging as the cover is closed to move the flap to its valve open position (if not already in this position).

22. A dispenser as claimed in any one of claims 16 to 21, wherein the body includes one or more web extending between the main cam and the movable junction member for reacting lateral cam force and transmitting longitudinal cam force to the movable junction member and/or the carrier where provided.

23. A dispenser as claimed in any one of claims 16 to 22, wherein the cocking lever includes a shaft having the main cam formed thereon, the shaft being of hollow half-round configuration and body includes at least one partially open journal for the half-round shaft.

24. A dispenser as claimed in any preceding claim, wherein the body includes a secondary body part attachable to a main body part to provide the mouthpiece and an air inlet between the two parts.

25. A dispenser as claimed in any one of claims 3 to 24, the dispenser including:

- a spring for assisting the movement to un-kink the tube and
- means to hold the movable member in the ready position to close the tube by kinking prior to inhalation.

26. A dispenser as claimed in claim 25, wherein the holding means is a frictional means holding the movable member ready for release and released by overcoming the frictional force holding the movable member in its ready position.

27. A dispenser as claimed in claim 25, wherein the holding means is a mounting of the movable member in an over-centre manner with respect to the spring, whereby the spring acts to urge the movable member into the ready position when close to this position, and away from it when the inhalation force on the movable member causes the spring to pass over-centre after a small movement of the movable member to assist in the un-kinking.

28. A dispenser as claimed in claim 3 or any one of claims 4 to 27 as appendant to claim 4, wherein the cocking lever is arranged to move the junction member, for dispensing of the substance to the valve.

29. A dispenser as claimed in claim 3 or any one of claims 4 to 28 as appendant to claim 4, wherein the cocking lever is a trigger arranged to be squeezed when the dispenser is to be used.

30. A dispenser as claimed in any preceding claim, wherein the source of the substance includes a metered dose valve, whereby it releases a metered dose each time the dispenser is operated.

31. A dispenser as claimed in any one of claims 1 to 29, wherein the source includes a non-metered dose valve, the dose being metered by the capacity of the breath actuatable valve.

32. A dispenser substantially as hereinbefore described with reference to Figures 6 to 12 or Figures 13 to 17 of the accompanying drawings.