CLAIMS

1. A humidification chamber for humidifying a pressurised gases stream generated by a blower of a CPAP respiratory device, comprising:

a water tub that is configured to receive a volume of water, the water tub comprising a base surface having a heater plate and comprising a perimeter wall that extends upwardly from the base surface, a perimeter rim extending from the perimeter wall, the base surface comprising an aperture;

a lid hingedly coupled by a hinge to the water tub for enclosing the water tub to define the interior volume of the humidification chamber and which is movable between a closed position in which the water tub is closed by the lid and an open position in which the water tub is open;

at least one operable clip provided on either the lid or water tub which is configured to engage with a complementary catch provided on the other of the water tub or lid, for securing the lid in the closed position;

a gases inlet in the lid for receiving the pressurised gases stream into the interior volume of the humidification chamber, the gases inlet having an associated inlet conduit that extends between an inlet end at the gases inlet and an outlet end located at or toward an upper central region of the interior volume of the humidification chamber and adjacent a first side surface of a vertical flow panel such that the incoming gases stream enters the interior volume of the humidification chamber at that upper central region;

a gases outlet in the lid through which a humidified pressurised gases stream may exit the interior volume of the humidification chamber, the gases outlet having an associated outlet conduit that extends between an inlet end located at or toward an upper central region of the interior volume of the humidification chamber and adjacent a second side of the vertical flow panel and an outlet end at the gases outlet, and

a seal about the perimeter rim of the water tub between the lid and water tub to seal the water tub when in the closed position,

wherein the vertical flow panel extends downwardly from the underside of the lid in a central region of the lid,

and wherein the humidification chamber is configured to be received and retained by a humidification compartment of the device.

2. The chamber of claim 1 wherein the heater plate is provided with a main contact surface which is configured to protrude beyond at least part of the surrounding base surface of the water tub.

3. The chamber of claim 1 or claim 2 wherein, when the lid is in the open position, the lid is pivoted open from the water tub to allow the tub to be filled with water or cleaned, with the lid open.

4. The chamber of any one of the preceding claims wherein the hinge is located at a first end of the chamber, and the one or more clips are provided at a second end of the humidification chamber for securing or locking the humidification chamber into the closed position ready for insertion and operation within the humidification compartment of the respiratory device, the second end being opposed from the first end.

5. The chamber of any one of the preceding claims wherein the heater plate and complementary aperture in the base surface of the water tub are rectangular.

6. The chamber of any one of the preceding claims wherein the heater plate has an outwardly domed or convex profile.

7. The chamber of any one of the preceding claims wherein the perimeter wall of the water tub comprises one or more reinforced regions configured to resist bending or deformation of the perimeter wall surfaces.

8. The chamber of claim 7 wherein the one or more reinforced regions comprise a reinforcing profile that is a corrugated or undulating surface profile.

9. The chamber of claim 7 wherein the one or more reinforced regions comprise spaced-apart reinforcing ridges or ribs on one or more portions of the peripheral wall.

10. The chamber of any one of the preceding claims further comprising a step formation about an inner surface perimeter of the perimeter wall of the water tub, the step formation being configured at a height above the base surface of the water tub corresponding to a maximum fill line.

11. The chamber of any one of the preceding claims wherein the heater plate further comprises an upright or substantially vertical wall portion that extends around the periphery of a main contact surface portion of the heater plate.

12. The chamber of claim 11 wherein the heater plate further comprises an outer substantially horizontal peripheral coupling surface or ledge portion that extends outwardly from the top of the vertical wall portion around the perimeter of the heater plate.

13. The chamber of any one of the preceding claims wherein the water tub is provided with a projection or projections that extend from the perimeter wall, the projection or projections being configured to engage with aligned rails provided on the humidification compartment of the device.

14. The chamber of claim 13 wherein the projection or projections comprises bumps or ridges.

15. The chamber of any one of the preceding claims wherein the one or more clips comprises an engagement aperture on the lid and its complementary catch is a protrusion or formation protruding from a side wall of the water tub that is aligned with the clip such that it engages into the engagement aperture of the clip when the clip is in an engaged position to secure the lid in the closed position.

16. The chamber of claim 15 wherein the protrusion or formation comprises a camming surface that is configured to cause its respective clip to pivot or flex outwardly before snapping into the fully engaged position with the complementary catch, when the lid is rotated into the closed position about the hinge without the user needing to operate the clip in order to engage it with the complementary catch.

17. The chamber of any one of the preceding claims wherein in the open position, an interior volume of the humidification chamber is open, that is, the interior volume of the humidification chamber, and the perimeter rim of the water tub, are exposed from directly above the humidification chamber.

18. The chamber of any one of the preceding claims wherein the lid remains connected to the water tub by the hinge when the lid is pivoted between the open and closed positions.

19. The chamber of any one of the preceding claims wherein the seal, the inlet conduit, the outlet conduit and the lid are configured such that spillage from the humidification chamber is prevented or resisted, when the lid is in the closed position.

20. The chamber of any one of the preceding claims wherein the hinge is attached between the lid and the water tub.

21. The chamber of claim 20 wherein the hinge is integrally formed with the lid.

22. The chamber of claim 20 or 21 wherein the hinge is integrally formed with the water tub.

23. The chamber of any one of claims 20 to 22 wherein the hinge is formed from plastic.

24. The chamber of any one of the preceding claims wherein the underside of the base surface of the water tub comprises a rigid plastic portion and an exposed metallic portion of the heater plate.

25. A respiratory assistance device configured to provide a heated and humidified gases stream, comprising:

a. a device gases inlet configured to receive a supply of therapeutic gases;
b. a blower configured to generate a pressurised gases stream from the supply of gases at an outlet of the blower;
c. a humidification chamber for humidifying the pressurised gases stream, comprising:

a water tub that is configured to receive a volume of water, the water tub comprising a base surface having a heater plate and comprising a perimeter wall that extends upwardly from the base surface, a perimeter rim extending from the perimeter wall, the base surface comprising an aperture;

a lid hingedly coupled by a hinge to the water tub for enclosing the water tub to define the interior volume of the humidification chamber and which is movable between a closed position in which the water tub is closed by the lid and an open position in which the water tub is open;

at least one operable clip provided on either the lid or water tub which is configured to engage with a complementary catch provided on the other of the water tub or lid, for securing the lid in the closed position;

a gases inlet in the lid for receiving the pressurised gases stream into the interior volume of the humidification chamber, the gases inlet having an associated inlet conduit that extends between an inlet end at the gases inlet and an outlet end located at or toward an upper central region of the interior volume of the humidification chamber and adjacent a first side surface of a vertical flow panel such that the incoming gases stream enters the interior volume of the humidification chamber at that upper central region; and

a gases outlet in the lid through which a humidified pressurised gases stream may exit the interior volume of the humidification chamber, the gases outlet having an associated outlet conduit that extends between an inlet end located at or toward an upper central region of the interior volume of the humidification chamber and adjacent a second side of the vertical flow panel and an outlet end at the gases outlet,

a seal about the perimeter rim of the water tub between the lid and water tub to seal the water tub when in the closed position,

wherein the vertical flow panel extends downwardly from the underside of the lid in a central region of the lid,

and wherein the humidifier comprises a humidification compartment that is configured to receive and retain the humidification chamber, the humidification compartment comprising an inlet fluidly connected to the outlet of the blower, and an outlet sealingly connected with the gases outlet of the humidification chamber.

26. The device of claim 25 wherein the heater plate is provided with a main contact surface which is configured to protrude beyond at least part of the surrounding base surface of the water tub.

27. The device of any one of claims 25 to 26 wherein, when the lid is in the open position, the lid is pivoted open from the water tub to allow the tub to be filled with water or cleaned, with the lid open.

28. The device of any one of claims 25 to 27 wherein the hinge is located at a first end of the chamber, and the one or more clips are provided at a second end of the humidification chamber for securing or locking the humidification chamber into the closed position ready for insertion and operation within the humidification compartment of the respiratory device, the second end being opposed from the first end.

29. The device of any one claims 25 to 28 wherein the heater plate and complementary aperture in the base surface of the water tub are rectangular.

30. The device of any one claims 25 to 29 wherein the heater plate has an outwardly domed or convex profile.

31. The device of any one of claims 25 to 30 wherein the perimeter wall of the water tub comprises one or more reinforced regions configured to resist bending or deformation of the perimeter wall surfaces.

32. The device of claim 31 wherein the one or more reinforced regions comprise a reinforcing profile that is a corrugated or undulating surface profile.

33. The device of claim 31 wherein the one or more reinforced regions comprise spaced-apart reinforcing ridges or ribs on one or more portions of the peripheral wall.

34. The device of any one of claims 25 to 33 further comprising a step formation about an inner surface perimeter of the perimeter wall of the water tub, the step formation being configured at a height above the base surface of the water tub corresponding to a maximum fill line.

35. The device of any one of claims 25 to 34 wherein the heater plate further comprises an upright or substantially vertical wall portion that extends around the periphery of a main contact surface portion of the heater plate.

36. The device of claim 35 wherein the heater plate further comprises an outer substantially horizontal peripheral coupling surface or ledge portion that extends outwardly from the top of the vertical wall portion around the perimeter of the heater plate.

37. The device of any one of claims 25 to 36 wherein the water tub is provided with a projection or projections that extend from the perimeter wall, the projection or projections being configured to engage with aligned rails provided on the humidification compartment.

38. The device of claim 37 wherein the projection or projections comprises bumps or ridges.

39. The device of any one of claims 25 to 38 wherein the one or more clips comprises an engagement aperture on the lid and its complementary catch is a protrusion or formation protruding from a side wall of the water tub that is aligned with the clip such that it engages into the engagement aperture of the clip when the clip is in an engaged position to secure the lid in the closed position.

40. The device of claim 39 wherein the protrusion or formation comprises a camming surface that is configured to cause its respective clip to pivot or flex outwardly before snapping into the fully engaged position with the complementary catch, when the lid is rotated into the closed position about the hinge without the user needing to operate the clip in order to engage it with the complementary catch.

41. The device of any one of claims 25 to 40 wherein in the open position, an interior volume of the humidification chamber is open, that is, the interior volume of the humidification chamber, and the perimeter rim of the water tub, are exposed from directly above the humidification chamber.

42. The device of any one of claims 25 to 41 wherein the lid remains connected to the water tub by the hinge when the lid is pivoted between the open and closed positions.

43. The device of any one of claims 25 to 42 wherein the seal, the inlet conduit, the outlet conduit and the lid are configured such that spillage from the humidification chamber is prevented or at least resisted, when the lid is in the closed position.

44. The device of any one of claims 25 to 43 wherein the hinge is attached between the lid and the water tub.

45. The device of claim 44 wherein the hinge is integrally formed with the lid.

46. The device of claim 44 or 45 wherein the hinge is integrally formed with the water tub.

47. The device of any one of claims 44 to 46 wherein the hinge is formed from plastic.

48. The device of any one of claims 25 to 47 wherein the underside of the base surface of the water tub comprises a rigid plastic portion and an exposed metallic portion of the heater plate.

49. The device of any one of claims 25 to 48 wherein the device is a CPAP respiratory assistance device.