CLAIMS

1. A humidification chamber for humidifying gases, comprising:

a water tub that is configured to receive a volume of water;

a lid hingedly coupled 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;

one or more operable clips for securing the lid in the closed position;

a gases inlet for receiving a flow of gases into the interior volume of the humidification chamber; and

a gases outlet through which a humidified flow of gases may exit the interior volume of the humidification chamber.

2. A humidification chamber according to claim 1 wherein the lid is formed from rigid plastic.

3. A humidification chamber according to claim 1 or claim 2 wherein the water tub is formed of rigid plastic and comprises a base surface and a perimeter wall that extends upwardly from the base, and wherein the base surface comprises a heater plate.

4. A humidification chamber according to claim 3 wherein the heater plate is secured within an aperture of the base surface of the water tub by overmolding.

5. A humidification chamber according to claim 4 wherein a peripheral coupling surface of the heater plate is secured within a periperhal engagement portion of the base surface about the aperture of the water tub by overmolding such that the thickness of the engagement portion is greater than the thickness of remaining base surface.

6. A humidification chamber according to claim 5 wherein the engagement portion comprises an upper portion above the coupling surface of the heater plate and a lower portion below the coupling surface, and wherein the upper portion is at least as thick as the remaining base surface.

7. A humidification chamber according to any one of claims 3-6 wherein the heater plate is metallic.

8. A humidification chamber according to any one of claims 3-7 further comprising a step formation about the inner surface perimeter of the 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 indicator.

9. A humidification chamber according to any one of claims 3-8 wherein the base surface of the water tub is domed such that it curves outward toward a central apex defined by the heater plate.

10. A humidification chamber according to any one of claims 3-9 wherein the perimeter wall of the water tub comprises one or more reinforced regions.

11. A humidification chamber according to claim 10 wherein the reinforced region(s) of the perimeter wall comprises corrugated surfaces of alternating ridges and furrows.

12. A humidification chamber according to any one of the preceding claims wherein the lid and water tub are hingedly coupled by a living hinge and are integrally formed as a single item.

13. A humidification chamber according to any one of the preceding claims wherein the gases inlet and gases outlet are provided on opposite sides of the lid.

14. A humidification chamber according to claim 13 wherein the lid comprises a vertical flow plane that extends downwardly from the underside of the lid in a central region of the lid.

15. A humidification chamber according to claim 14 wherein the vertical flow plane further comprises a pair of side baffles that each extend from a respective side edge of the vertical flow plane toward the side of the lid comprising the gases inlet.

16. A humidification chamber according to claim 14 or claim 15 wherein the gases inlet is coupled to an 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 the vertical flow plane such that the incoming gases flow enters the interior volume of the humidification chamber at that upper central region.

17. A humidification chamber according to claim 16 wherein a flow director formation in the form of an inverted curved ramp surface is located between the outlet end of the inlet conduit and the first side surface of the vertical flow plane.

18. A humidification chamber according to claim 16 or claim 17 wherein the gases outlet is coupled to an 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 plane and an outlet end at the gases outlet.

19. A humidification chamber according to any one of the preceding claims wherein the gases outlet of the lid comprises an engagement surface about the perimeter of the gases outlet that is tilted outwardly such that an upper portion of the engagement surface is displaced further outward from the lid than a lower portion of the engagement surface.

20. A humidification chamber according to any one of the preceding claims wherein the lid comprises one or more water fill apertures and at least one water fill aperture comprising an associated maximum water level indicator comprising a tab member that is supported from the underside of the lid such that it extends into the field of view of the interior volume of the humidification chamber visible directly through the water fill aperture.

21. A humidification chamber according to any one of the preceding claims wherein the humidification chamber has an overall shape defined by front and end walls between which side walls extend, and the walls extending between an upper surface of the lid and base surface of the water tub, and wherein the lid is hingedly coupled to the water tub at the rear end of the

humidification chamber, and at least one operable clip is provided at the front end of the humidification chamber.

22. A humidification chamber according to any one of the preceding claims wherein at least one operable clip is provided in the form of a torsion clip that is mounted to either the lid or water tub and which is configured to engage with a catch provided on either the water tub or lid, respectively.

23. A humidification chamber according to any one of the preceding claims wherein at least one operable clip is provided that is hingedly coupled to the lid or water tub and which is configured to engage with a catch provided on either the water tub or lid, respectively.

24. A humidification chamber according to any one of the preceding claims further comprising a seal about the perimeter of the chamber between the lid and water tub to seal the chamber when it is in a closed position.

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

a device gases inlet configured to receive a supply of gases;

a blower configured to generate a pressurised gases stream from the supply of gases;

a humidifier configured to heat and humidify the pressurised gases stream;

a device gases outlet for the heated and humidified gases stream; and

a flow path for the gases stream through the respiratory device from the gases inlet though the blower unit and humidification unit to the gases outlet,

and wherein the humidifier comprises a sealable humidification compartment that is configured to receive and retain a removable humidification chamber according to any one of the preceding claims.

26. A respiratory assistance device according to claim 25 wherein the humidification compartment comprises a lid that is movable between an open position to enable removal of the humidification chamber and a closed position to seal the humidification chamber within the humidification compartment.

27. A respiratory assistance device according to claim 25 or claim 26 wherein the humidification compartment comprises a gases inlet connected to the flow path to receive the pressurised gases stream from the blower to create a pressurised humidification compartment and a gases outlet connected to the device gases outlet of the flow path.

28. A respiratory assistance device according to claim 27 wherein the gases inlet of the humidification chamber is open within the humidification compartment to receive an incoming flow of gases from within the pressurised humidification compartment.

29. A respiratory assistance device according to claim 27 or claim 28 wherein the gases outlet of the humidification compartment is sealingly connected to the gases outlet of the humidification chamber.

30. A respiratory assistance device according to any one of claims 25-29 wherein the humidification compartment comprises a heater pad upon which the humidification chamber sits.

31. A respiratory device according to any one of claims 25-30 wherein the device is contained within a single housing.

32. A respiratory device according to any one of claims 25-31 wherein the device is a CPAP respiratory device.

CLAIMS

1. A humidification chamber for humidifying gases, comprising:

a water tub that is configured to receive a volume of water, the water tub comprising a base surface having a heater plate;

a lid hingedly coupled 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;

one or more operable clips for securing the lid in the closed position, the one or more operable clips comprising at least one operable clip that is provided on either the lid or water tub and which is configured to engage with a complementary catch provided on either the water tub or lid, respectively;

a gases inlet in the lid for receiving a flow of gases into the interior volume of the humidification chamber, the gases inlet having an associated inlet conduit extending into the interior volume of humidification chamber; and

a gases outlet in the lid through which a humidified flow of gases may exit the interior volume of the humidification chamber, the gases outlet having an associated outlet conduit extending into the interior volume of the humidification chamber.

2. A humidification chamber according to claim 1 wherein the lid is rigid plastic.

3. A humidification chamber according to claim 1 or claim 2 wherein the water tub is rigid plastic and wherein the heater plate is formed of a thermally conductive material.

4. A humidification chamber according to any one of the preceding claims wherein the heater plate is metallic.

5. A humidification chamber according to any one of the preceding claims wherein the heater plate is pressed or shaped from sheet metal.

6. A humidification chamber according to any one of the preceding claims wherein the heater plate is fixed to or integrated the water tub

7. A humidification chamber according to any one of the preceding claims wherein the water tub is rigid plastic and the heater plate is metallic, and 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.

8. A humidification chamber according to any one of the preceding claims wherein the base surface of the water tub overlaps a portion of the heater plate such that a portion of the underside of the base surface is thermally insulated from the heater plate.

9. A humidification chamber according to any one of the preceding claims wherein the heater plate is exposed through an aperture in the base surface of the water tub.

10. A humidification chamber according to claim 9 wherein the heater plate is any one of the following shapes: circular, square or rectangular.

11. A humidification chamber according to claim 9 or claim 10 wherein the heater plate is exposed through an aperture in the base surface of the water tub that is any of the following shapes: circular, square or rectangular.

12. A humidification chamber according to any one of claims 9-11 wherein the heater plate comprises a contact surface that is aligned with the aperture in the base surface of the water tub and which is configured to extend or protrude from an underside of the base surface of the water tub.

13. A humidification chamber according to claim 12 wherein the heater plate further comprises a substantially vertical wall portion that extends around the periphery of the contact surface and a substantially horizontal portion that extends outwardly from the top of the vertical wall portion.

14. A humidification chamber to any one of the preceding claims wherein the water tub further comprises a perimeter wall that extends upwardly from the base surface, and a lip extending from the upper edge of the perimeter wall.

15. A humidification chamber according to any one of the preceding claims wherein the inlet conduit of the gases inlet of the lid is configured to channel or direct the gases flow into a central zone or region of the lid.

16. A humidification chamber according to any one of the preceding claims wherein the gases inlet of the lid comprises an inlet aperture in a wall of the lid, and wherein the inlet conduit extends between an inlet end located at the inlet aperture and an outlet end located at or toward an upper central region of the interior volume of the humidification chamber.

17. A humidification chamber according to claim 16 wherein the inlet aperture of the gases inlet is circular.

18. A humidification chamber according to claim 16 or claim 17 wherein the inlet conduit of the gases inlet is located at or toward the top of the lid.

19. A humidification chamber according to any one of claims 16-18 wherein a flow directing formation is provided at the outlet end of the inlet conduit for directing the flow of gases exiting the inlet conduit.

20. A humidification chamber according to any one of claims 16-19 further comprising a vertical flow panel at or toward the outlet end of the inlet conduit that is configured to minimise gases exiting the inlet conduit from flowing directly toward the outlet conduit of the gases outlet.

21. A humidification chamber according to any one of the preceding claims wherein the inlet conduit comprises one or more bends.

22. A humidification chamber according to any one of the preceding claims wherein the outlet conduit of the gases outlet extends into a central zone or region of the lid.

23. A humidification chamber according to any one of the preceding claims wherein the gases outlet of the lid comprises an outlet aperture in a wall of the lid, and wherein the outlet conduit extends between an inlet end located at or toward an upper central region of the interior volume of the humidification chamber and an outlet end at the outlet aperture.

24. A humidification chamber according to claim 23 wherein the outlet aperture of the gases outlet is circular.

25. A humidification chamber according to any one of the preceding claims wherein the outlet conduit is straight.

26. A humidification chamber according to any one of the preceding claims wherein the lid and water tub are hingedly coupled by one or more hinges.

27. A humidification chamber according to any one of the preceding claims wherein the humidification chamber has a front end and a rear end, and wherein the lid is hingedly coupled to the water tub at the rear end of the humidification chamber, and wherein the at least one operable clip and its complementary catch are provided at the front end of the humidification chamber.

28. A humidification chamber according to any one of the preceding claims wherein the at least one clip is operable between an engaged position and disengaged position with its complementary catch.

29. A humidification chamber according to any one of the preceding claims wherein the at least one operable clip comprises an engagement aperture and its complementary catch is a protrusion or formation 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.

30. A humidification chamber according to claim 29 wherein the catch formation comprises a camming surface that is configured to cause its respective operable clip to pivot or flex outwardly before snapping into the fully engaged position with its complementary catch.

31. A humidification chamber according to any one of the preceding claims wherein the humidification chamber has a front end and a rear end, and wherein the lid is hingedly coupled to the water tub at the rear end of the humidification chamber, and wherein a single operable clip is provided on the front end of the lid and which is resiliently moveable between an engaged position and disengaged position with a complementary catch provided on the front end of the water tub.

32. A humidification chamber according to any one of the preceding claims further comprising a seal between the lid and water tub to seal the chamber when it is in a closed position.

33. A humidification chamber according to claim 32 wherein the seal is a flexible seal that extends about a perimeter of the humidification chamber at an interface between the lid and water tub.

34. A humidification chamber according to claim 32 or claim 33 wherein the seal is formed from silicone.

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

a device gases inlet configured to receive a supply of gases;

a blower configured to generate a pressurised gases stream from the supply of gases;

a humidifier configured to heat and humidify the pressurised gases stream;

a device gases outlet for the heated and humidified gases stream; and

a flow path for the gases stream through the respiratory device from the device gases inlet though the blower unit and humidification unit to the device gases outlet,

and wherein the humidifier is configured to receive and retain a removable humidification chamber according to any one of claims 1-34.

36. A respiratory assistance device according to claim 35 wherein the humidifier comprises a compartment that is configured to receive and retain the humidification chamber.

37. A respiratory assistance device according to claim 36 wherein the humidification compartment comprises a gases inlet connected to the flow path to receive the pressurised gases stream from the blower and a gases outlet connected to the device gases outlet of the flow path.

38. A respiratory assistance device according to claim 37 wherein the gases inlet of the humidification chamber is configured to sealingly connect with the gases inlet of the humidification compartment.

39. A respiratory assistance device according to claim 37 or claim 38 wherein the gases outlet of the humidification compartment is configured to sealingly connect to the gases outlet of the humidification chamber.

40. A respiratory assistance device according to claim 39 wherein the gases outlet of the humidification compartment comprises a seal that is configured to sealingly engage with the gases outlet of the humification chamber.

41. A respiratory assistance device according to any one of claims 35-40 wherein the humidification compartment comprises a powered heater pad upon which the humidification chamber sits and wherein the heater pad is configured to engage with a contact surface of the heater plate of the humidification chamber.

42. A respiratory device according to any one of claims 35-41 wherein the device is a CPAP respiratory device.