WHAT IS CLAIMED IS:

1. A respiratory support apparatus configured to provide a gases flow to a patient, the respiratory support apparatus comprising:

a flow generator configured to generate the gases flow;

a humidifier configured to humidify the gases flow, the humidifier comprising a humidifier heater;

a controller, the apparatus being controlled by the controller to function in at least two modes, being a normal mode and a high-temperature mode, wherein when in the high-temperature mode, the temperature of gases delivered to the patient is higher than the temperature of gases delivered to the patient in the normal mode;

the apparatus further being controlled by the controller in a further mode, being a cool-down mode, the cool-down mode being operative after the high-temperature mode ends, such that when in the cool-down mode, any one or more of:

a. the flow rate is controlled to a flow rate set point, wherein the rate of change of the flow rate from the flow rate used during high-temperature mode to the flow rate set point is controlled to be below a predetermined threshold;
b. the electrical power supplied to the humidifier heater is reduced from that used during normal and/or high-temperature mode; and/or
c. a temperature set point of the gases flow delivered to the patient is reduced from that during high-temperature mode;
d. the flow rate, and/or the rate of change of the flow rate from the flow rate used during high-temperature mode, is controlled according to a predetermined flow-time curve/relationship.

2. The apparatus of claim 1 wherein the cool-down mode is automatically selected by the controller, in response to one or more predetermined conditions of operation of the apparatus.

3. The apparatus of claim 2 wherein the one or more predetermined conditions of operation are selected from any one or more of:

    a. a predetermined period of time, as determined by a timer;
    b. a predetermined number of counts, as determined by a counter;
    c. a gases flow dew-point being exceeded;
    d. a gases flow enthalpy being exceeded;
    e. the user exiting high-temperature mode.

4. The apparatus of any one of claims 1 to 3 wherein the controller returns the apparatus to normal mode, after the cool-down mode.

5. The apparatus of claim 4 wherein the controller returns the apparatus to normal mode after a predetermined period of time, which may be in the range of 15 to 60 minutes, or 30 minutes.

6. The apparatus of claim 4 wherein the controller returns the apparatus to normal mode in dependence upon the temperature of the gases flow.

7. The apparatus of claim 6 wherein the controller returns the apparatus to normal mode in dependence upon the temperature of the gases flow being less than a predetermined temperature.

8. The apparatus of claim 4 wherein the controller returns the apparatus to normal mode in dependence upon the dew-point of the gases flow.

9. The apparatus of claim 4 wherein the controller returns the apparatus to normal mode in dependence upon the enthalpy of the gases flow.

10. The apparatus of any one of claims 1 to 9 wherein when in the high-temperature mode, the gases flow to the patient is in a temperature range of 41 to 50 °C, preferably 43 to 47 °C.

11. A respiratory support apparatus configured to provide a gases flow to a patient, the respiratory support apparatus comprising:

    a flow generator configured to generate the gases flow;

    a humidifier configured to humidify the gases flow;

a controller, the apparatus being controlled by the controller to function in at least two modes, being a normal mode and a high-temperature mode, wherein when in the high-temperature mode, the temperature of gases delivered to the patient is higher than the temperature of gases delivered to the patient in normal mode;

wherein the controller controls the apparatus to restrict a characteristic of the gases flow during high-temperature mode, and/or immediately after termination of high-temperature mode, such that the enthalpy and/or the dew-point of the gases flow is below a predetermined level.

12. The apparatus of any one of the preceding claims wherein when in the high-temperature mode, the gases flow to the patient is in a temperature range of 41 to 50 °C, preferably 43 to 47 °C.

13. The apparatus of claim 6 or 7 wherein the controller returns the apparatus to normal mode when a measured temperature at a humidifier outlet, or at a patient end of a hose delivering the gases flow to a patient interface from the humidifier is less than the predetermined temperature.

14. The apparatus of any of the previous claims wherein when in the cool-down mode the controller does not change the flow rate until the temperature measured at the patient end of a hose delivering the gases flow to a patient interface from the humidifier and/or at the outlet a humidifier outlet falls below a predetermined threshold.

15. The apparatus of any of claims 4 to 14 wherein in the normal mode, the controller controls the gases flow to have any one or more of the following characteristics:

a) a dew-point in the range of 31 °C – 37 °C;
b) a temperature in the range of 31 °C – 37 °C;
c) a flow rate in the range of 10 L/min – 70 L/min.