

Claims

1. A heating, ventilation and air conditioning (HVAC) system for conditioning air within a chamber, the system comprising:
 - 5 an inlet,
 - an outlet, and
 - a conditioning unit,the conditioning unit comprising a fan configured to urge air into the system from the chamber via the inlet and out of the system into the chamber via the outlet, and a heat
10 exchanger configured to exchange heat with the air within the conditioning unit,
wherein during operation, air is urged through conditioning unit by the fan such that heat is exchanged between the air and the heat exchanger, wherein the fan is configured to vary the flow rate of air urged through the conditioning unit to thereby control the amount of heat transferred between the air and the heat exchanger.
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2. The HVAC system according to claim 1, wherein the heat exchanger is configured such that the temperature of the heat exchanger is adjustable (or the heat exchanger is configured such that the temperature of the surface of the heat exchanger is adjustable).
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3. The HVAC system according to claim 2, wherein the HVAC system is configured to reduce the humidity of the air passing through the conditioning unit by adjusting the temperature of the heat exchanger below the dew point of the air.
- 25 4. The HVAC system according to any preceding claim, wherein the heat exchanger is a cooling coil.
5. The HVAC system according to any preceding claim, wherein the heat exchanger contains a coolant that flows through the heat exchanger.
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6. The HVAC system according to any of claims 2 to 5, wherein the temperature of the heat exchanger is controlled by varying the coolant temperature.
7. The HVAC system according to any of claims 5 or 6, wherein the temperature of the
35 heat exchanger is controlled by varying the flow rate of coolant through the heat exchanger.

8. The HVAC system according to any preceding claim, wherein the conditioning unit further comprises a controller, one or more sensors adjacent to the inlet, and one or more sensors adjacent to the outlet, and during use the controller is configured to (i) receive signals from the one or more sensors adjacent to the inlet and the one or more sensors adjacent to the outlet, (ii) determine whether the air entering the inlet is at a target temperature, and/or a target humidity and (iii) adjust the fan speed such that the air contacts the heat exchanger to transfer heat between the heat exchanger and the air to thereby reach the target temperature and/or humidity.
9. The HVAC system according to any of claims 2 to 7, wherein the conditioning unit further comprises a controller, one or more sensors adjacent to the inlet, and one or more sensors adjacent to the outlet, and during use the controller is configured to (i) receive signals from the one or more sensors adjacent to the inlet and the one or more sensors adjacent to the outlet, (ii) determine whether the air entering the inlet is at the target temperature, and/or the target humidity, (iii) adjust the fan speed such that the air contacts the heat exchanger to transfer heat between the heat exchanger and the air to thereby reach the target temperature, and (iv) adjusts the temperature of the heat exchanger to thereby reach the target humidity.
10. The HVAC system according to any preceding claim further comprising a vent.
11. The HVAC system according to any preceding claim further comprising an external inlet.
12. An enclosed space comprising the HVAC system according to any preceding claim.
13. The enclosed space according to claim 12, wherein the enclosed space is selected from the group a greenhouse, a vertical growth tower, an office space, a retail space, an industrial space, a commercial space, or a domestic space.
14. A method of conditioning air within a closed space using the HVAC system of any of claims 1 to 11, the method comprising the steps:
- (a) providing a HVAC system comprising an inlet, an outlet, and a conditioning unit, the conditioning unit comprising a fan configured to urge air into the system from the chamber via the inlet and out of the system into the chamber via the outlet, and a heat exchanger configured to exchange heat with the air within the

conditioning unit, a controller, a first plurality of sensors adjacent to the inlet of the HVAC system;

(b) setting one or more target values selected from the group humidity and temperature;

5 (c) the controller receiving one or more readings from the first plurality of sensors and determining system values selected from the group humidity and temperature;

(d) the controller comparing the system values with the target values and determining the difference between the target values and the system values;

10 (e) the controller adjusting the fan speed and/or the temperature of the heat exchanger to adjust the heat exchanged between air in the conditioning unit and the heat exchanger and/or to adjust the humidity of the air;

(f) repeating steps (c) to (e) until the system values are equal to the target values, or until the system values are within a predetermined range of values around
15 the target values.