CLAIMS

[Claim 1]

An air conditioning system comprising:

a rotor that is partitioned into a processing zone including an absorbent of carbon dioxide which is an amine-carrying solid absorbent and allowing the absorbent to absorb carbon dioxide contained in processing air when the processing air flows therein and a regeneration zone allowing carbon dioxide absorbed by the absorbent to be desorbed to regeneration air when the regeneration air flows therein;

a first processing air supply part that is configured to supply air in a room as the processing air to the processing zone;

a second processing air supply part that is configured to supply the processing air passing through the processing zone to the room;

a regeneration air supply part that is configured to supply outdoor air as the regeneration air to the regeneration zone;

a regeneration air discharge part that is configured to discharge the regeneration air passing through the regeneration zone to outside of the room; and

a fan coil unit that is separated from the rotor and configured to cause air in the room to circulate,

wherein a total heat exchanger and a cooling device are sequentially provided from upstream to downstream in a supply direction in the first processing air supply part,

wherein the regeneration air supply part is configured to share the total heat exchanger,

wherein the total heat exchanger and a heating device are sequentially provided from upstream to downstream in the supply direction in the regeneration air supply part,

wherein the total heat exchanger, the cooling device, the heating device and the fan coil unit are driven so that an enthalpy difference between the processing air supplied to the processing zone and the regeneration air supplied to the regeneration zone is equal to or greater than 30 kJ/kg (DA),

wherein the total heat exchanger and the heating device are set to an OFF state and the cooling device and the fan coil unit are set to an ON state when a temperature of outdoor air is higher than a determined temperature of summer season and humidity of outdoor air is higher than a determined humidity of summer season,

wherein the cooling device is set to an OFF state and the total heat exchanger, the heating device and the fan coil unit are set to an ON state when temperature of outdoor air is lower than a determined temperature of winter season and humidity of outdoor air is lower than a determined humidity of winter season, and

wherein the total heat exchanger, the cooling device, the heating device and the fan coil unit are set to an ON state when temperature of outdoor air is between the determined temperature of winter season and the determined temperature of summer season and humidity of outdoor air is between the determined humidity of winter season and the determined humidity of summer season.

[Claim 2]

An air conditioning system comprising:

a rotor that is partitioned into a processing zone including an absorbent of carbon dioxide which is an amine-carrying solid absorbent and allowing the absorbent to absorb carbon dioxide contained in processing air when the processing air flows therein and a regeneration zone allowing carbon dioxide absorbed by the absorbent to be desorbed to regeneration air when the regeneration air flows therein;

a first processing air supply part that is configured to supply air in a room as the processing air to the processing zone;

a second processing air supply part that is configured to supply the processing air passing through the processing zone to the room;

a regeneration air supply part that is configured to supply outdoor air as the regeneration air to the regeneration zone;

a regeneration air discharge part that is configured to discharge the regeneration air passing through the regeneration zone to outside of the room; and

a fan coil unit that is separated from the rotor and configured to cause air in the room to circulate,

processing air supply part, wherein a heating device is provided in the regeneration air supply part,

wherein a part of the air of the room is configured to supply to the regeneration air supply part upstream from the heating device,

wherein the cooling device, the heating device and the fan coil unit are driven so that an enthalpy difference between the processing air supplied to the processing zone and the regeneration air supplied to the regeneration zone is equal to or greater than 30 kJ/kg (DA),

wherein the air of the room is configured not to supply upstream to the heating device in the regeneration air supply part when temperature of outdoor air is higher than a determined temperature of summer season and humidity of outdoor air is higher than a determined humidity of summer season, and

wherein the air of the room is configured to supply upstream to the heating device in the regeneration air supply part when temperature of outdoor air is lower than a determined temperature of winter season and humidity of outdoor air is lower than a determined humidity of winter season.

[Claim 3]

An air conditioning system comprising:

a rotor that is partitioned into a processing zone including an absorbent of carbon dioxide which is an amine-carrying solid absorbent and allowing the absorbent to absorb carbon dioxide contained in processing air when the processing air flows therein and a regeneration zone allowing carbon dioxide absorbed by the absorbent to be desorbed to regeneration air when the regeneration air flows therein;

a first processing air supply part that is configured to supply air in a room as the processing air to the processing zone;

a second processing air supply part that is configured to supply the processing air passing through the processing zone to the room;

a regeneration air supply part that is configured to supply outdoor air as the regeneration air to the regeneration zone;

a regeneration air discharge part that is configured to discharge the regeneration air passing through the regeneration zone to outside of the room; and

an air handling unit and a cooling device are provided from upstream to downstream in a supply direction in the first processing air supply part,

wherein a part of air supplied from the air handling unit is configured to supply to the room,

wherein the remaining part of the air supplied from the air handling unit is configured to supply to the cooling device,

wherein a first heating device, a humidifier and a second heating device are provided from upstream to downstream in a supply direction in the regeneration air supply part,

wherein the air handling unit, the cooling device, the first heating device, the humidifier and the second heating device are driven so that an enthalpy difference between the processing air supplied to the processing zone and the regeneration air supplied to the regeneration zone is equal to or greater than 30 kJ/kg (DA),

wherein conditions of the processing air supplied to the air handling unit are changed when temperature of outdoor air is higher than a determined temperature of summer season and humidity of outdoor air is higher than a determined humidity of summer season, and

wherein conditions of the processing air supplied to the air handling unit are maintained when temperature of outdoor air is lower than a determined temperature of winter season and humidity of outdoor air is lower than a determined humidity of winter season.

[Claim 4]

An air conditioning system comprising:

a rotor that is partitioned into a processing zone including an absorbent of carbon dioxide which is an amine-carrying solid absorbent and allowing the absorbent to absorb carbon dioxide contained in processing air when the processing air flows therein and a regeneration zone allowing carbon dioxide absorbed by the absorbent to be desorbed to regeneration air when the regeneration air flows therein;

a first processing air supply part that is configured to supply air in a room as the processing air to the processing zone;

a second processing air supply part that is configured to supply the processing air passing through the processing zone to the room;

a regeneration air supply part that is configured to supply outdoor air as the regeneration air to the regeneration zone;

a regeneration air discharge part that is configured to discharge the regeneration air passing through the regeneration zone to outside of the room,

a fan coil unit that is separated from the rotor and configured to cause air in the room to circulate; and

a heat pump including a compressor, an expansion valve, a condenser that is configured to condense a heat medium which circulates between the compressor and the expansion valve, and a first evaporator and a second evaporator that expand the heat medium;

wherein a humidifier is provided in the regeneration air discharge part,

wherein the processing air is configured to pass through the first evaporator in the first processing air supply part,

wherein the regeneration air is configured to sequentially pass through the condenser and the humidifier in the regeneration air supply part,

wherein the regeneration air passed through the regeneration zone is configured to pass through the second evaporator,

wherein the fan coil unit, the compressor, the expansion valve, a condenser, the first evaporator and the second evaporator are driven so that an enthalpy difference between the processing air supplied to the processing zone and the regeneration air supplied to the regeneration zone is equal to or greater than 30 kJ/kg (DA),

wherein conditions of the condenser and the first evaporator are changed using the compressor and the expansion value when temperature of outdoor air is higher than a determined temperature of summer season and humidity of outdoor air is higher than a determined humidity of summer season, and

wherein conditions of the condenser and the first evaporator are changed using the compressor and the expansion value and recovering heat from the first evaporator and the second evaporator when temperature of outdoor air is lower than a determined temperature of winter season and humidity of outdoor air is lower than a determined humidity of winter season.

[Claim 5]

The air conditioning system according to claims 1 to 4, wherein a carbon dioxide removal ratio in the room is equal to or greater than 30%.