members have a width greater than a width of the ventilation holes. In the configuration of the Patent Document 1, the seal members and both of the end surface portions of the case are in contact with each other, preventing the honeycomb body from making direct contact with the seal member. Wear of the honeycomb body can thus be avoided.

CITATION LIST

PATENT DOCUMENT

[0005]

Patent Document 1: Japanese Patent No. 3755708

SUMMARY OF THE INVENTION

TECHNICAL PROBLEM

[0006]

However, according to the configuration of Patent Document 1, edges of the seal members are brought into contact with both of the end surface portions of the case all the time, and loads are concentrated on the edges; therefore, the edges of the seal members are shaved faster than the other portions of the seal members, and wear progresses. As a result, air leakage occurs at the edges of the seal members, resulting in problems such as reduced effective ventilation and increased unnecessary airflow volume.

[0007]

Embodiments of the present disclosure reduce air leakage due to wear of a seal member defining an air passage in an air conditioning rotating body having a rotor.

SOLUTION TO THE PROBLEM

[0008]

According to a first aspect of the present disclosure, there is provided an air conditioning rotating body having a rotor in a cylindrical shape, the rotor being housed in a casing so as to be freely rotatable, the air conditioning rotating body being configured to treat air passing through the rotor in an axial direction, wherein the casing includes a seal member extending in a radial direction of the rotor and separating air passages, an end face of the rotor in the axial direction is provided with at least one spoke in contact with the seal member, and a contact point of the seal member with the spoke moves in the radial direction as the rotor rotates, wherein the seal member is brought into contact with a plurality of the spokes.

[0009]

According to the first aspect, the contact point between the spoke on the end face of the rotor in the axial direction and the seal member that separates the air passages moves in the radial direction as the rotor rotates. It is therefore possible to reduce air leakage due to local progress of wear caused by concentration of loads on a specific portion of the seal member. Furthermore, the structure of supporting the seal member by the spokes at multiple points can further reduce local wear of the seal member.

[0010]

[0011]

[0012]

In an embodiment of the first aspect, the spoke is curved in a circumferential direction of the rotor.

[0013]

According to the above embodiment, the seal member is supported by the spoke curved in the circumferential direction, the support point for the seal member is movable as the rotor rotates. Wear of the seal member can thus be reduced.

[0014]

In an embodiment of the first aspect, the end face of the rotor is further provided with a reinforcing rib extending in the radial direction.

[0015]

According to the above embodiment, the reinforcing rib is provided on the end face of the rotor in the axial direction. This configuration can reinforce the support structure for the rotor and reduce warpage of the rotor. An increase in gap between the rotor and the seal member can thus be reduced, making it possible to reduce air leakage.

[0016]

In an embodiment of the first aspect, the end face of the rotor is further provided with an annular member surrounding a center of the rotor circumferentially.

[0017]

According to the above embodiment, the arrangement of the annular member increases the number of support points for the seal member, spreading the load per support point on the seal member. Local wear of the seal member can thus be further reduced. Connecting the annular member with the spoke can reinforce the spoke.

[0018]

In an embodiment of the first aspect, the spoke is provided on each of both end faces of the rotor in the axial direction, and the spokes provided on both the end faces overlap each other when viewed from the axial direction.

[0019]

According to the above embodiment, the air that has flowed into the rotor through open regions on one side in the axial direction of the rotor flows out through open regions on the other side in the axial direction of the rotor without colliding with non-opening regions on the other side. The substantial opening area is therefore increased on both sides in the axial direction of the rotor, making it possible to improve the air conditioning capacity.

[0020]

According to a second aspect of the present disclosure, there is provided an air treatment device having the air conditioning rotating body according to the first aspect.

[0021]

The air treatment device of the second aspect has the air conditioning rotating body that can reduce the air leakage caused by wear of the seal member separating air passages. Thus, the performance of the air treatment device, such as dehumidification and humidification performance and heat exchange performance, can be improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022]

FIG. 1 is a schematic view illustrating a general configuration of an air treatment device according to an embodiment.

FIG. 2 is a schematic view illustrating a cross-sectional configuration of an air conditioning rotating body according to the embodiment.

FIG. 3 is a perspective view of a rotor constituting the air conditioning rotating body according to the embodiment.

CLAIMS

1. An air conditioning rotating body having a rotor in a cylindrical shape, the rotor being housed in a casing so as to be freely rotatable, the air conditioning rotating body being configured to treat air passing through the rotor in an axial direction, wherein

the casing includes a seal member extending in a radial direction of the rotor and separating air passages,

an end face of the rotor in the axial direction is provided with at least one spoke in contact with the seal member, and

a contact point of the seal member with the spoke moves in the radial direction as the rotor rotates,

wherein the seal member is brought into contact with a plurality of the spokes.

2. The air conditioning rotating body of claim 1, wherein

the spoke is curved in a circumferential direction of the rotor.

3. The air conditioning rotating body of claim 1 or 2, wherein

the end face of the rotor is further provided with a reinforcing rib extending in the radial direction.

4. The air conditioning rotating body of any one of claims 1 to 3, wherein

the end face of the rotor is further provided with an annular member surrounding a center of the rotor circumferentially.

5. The air conditioning rotating body of any one of claims 1 to 4, wherein the spoke is provided on each of both end faces of the rotor in the axial direction, and the spokes provided on both the end faces overlap each other when viewed from the axial direction.

6. An air treatment device comprising the air conditioning rotating body of any one of claims 1 to 5.