

Description

Title of the Invention: Device for distributing air-conditioning air for a turret

5 The field of the invention is that of devices for distributing air-conditioning air for military vehicles having a turret.

 Military vehicles with turrets require air conditioning and ventilation in order to ensure satisfactory living
10 conditions for the crew and adequate operating temperatures for the on-board equipment.

 Circulation of air in the vehicle body is typically provided by a ventilation unit coupled to an air conditioner and a ventilation network that includes pipes moving air
15 towards the occupants and equipment. The ventilation of the turret, on the other hand, is quite delicate given the confined nature of the turret and the fact that it pivots, which makes it difficult to connect the ventilation network of the vehicle body with a ventilation network of the turret.

20 Patent EP3077235 proposes a device for distributing air-conditioning air between the body of a vehicle and the turret, which includes at least one circular chute located at the periphery of the bottom of the turret basket.

 This chute is secured to the body, whilst a lid secured to
25 the turret covers the open part of the chute whilst rotating relative to the chute. Fresh air injected through an opening of the chute can thus circulate freely within it until it exits into the turret through an outlet opening in the lid, and this applies in all angular orientations of the turret
30 relative to the body.

 Such a device raises the issue of cluttering the periphery of the bottom of the turret basket, and requires a circular shape that is not always suited for optimal coexistence with

nearby equipment that is, for example, parallelepiped in shape.

Thus, the invention proposes an air distribution device for a turret with reduced clutter and facilitating its
5 adaptation to the shape of surrounding equipment.

Patent application FR3057948 discloses a device for distributing air-conditioning air as defined in the preamble of claim 1.

Thus, the invention relates to a device for distributing
10 air-conditioning air for a turret of a vehicle that is rotatably mounted relative to a chassis of the vehicle, the device comprising a rotating joint intended for electrically connecting the turret and the chassis of the vehicle and to be coaxial with the turret, the rotating joint including a stator
15 intended to be secured to the chassis and a rotor intended to be secured to the turret, wherein the device is characterized in that it includes a cover that forms a chamber delimiting a volume in which the rotor is housed and that is perforated by at least one air outlet, wherein the cover is secured in an
20 airtight fashion to the rotor, wherein the cover is located at the center of a first disc to which the edges of the side walls of the cover are secured, the device includes a second disc which is pressed against the first disc with a sealing means interposed therebetween, wherein the second disc has
25 substantially the same diameter as the first disc, is coaxial with it and is secured to the stator, and can thus rotate in an airtight fashion relative to the first disc and seals the chamber delimited by the cover, wherein the second disc includes an air inlet provided near the stator, wherein the
30 side walls of the cover are located at such a distance from the rotor that the air inlet provided in the second disc is always at least partly open into the volume of the chamber in all angular orientations of the rotor relative to the stator.

In one embodiment, the air inlet may have an L shape delimited in part by the stator.

Advantageously, the rotor may be secured to a bottom wall of the cover.

5 In a particular embodiment, at least one air outlet of the one or more air outlets is provided at one of the side walls of the cover.

In a particular embodiment, at least one air outlet of the one or more air outlets is provided at a bottom wall of the
10 cover.

The invention will be better understood upon reading the following description, with reference to the drawings appended hereto, which show:

[Fig. 1] is a schematic longitudinal section view of a
15 vehicle equipped with a device according to the invention.

[Fig.2] is a partial longitudinal section view of the device according to the invention.

[Fig. 3] is a partial cross section view of the device according to the invention.

20 [Fig. 4] is similar to [Fig. 3], but shows the rotor pivoted approximately 35° anticlockwise.

[Fig. 5] is similar to [Fig. 3], but shows the rotor pivoted approximately 100° clockwise.

In Figure 1, a military vehicle 100 includes a chassis 101
25 and an armed turret 102 mounted pivotably relative to the chassis 101 about a vertical axis Z.

The vehicle 100 includes an electrical rotating joint 10
that allows for data and energy to be transferred between the chassis 101 and the turret 102 in all angular orientations of
30 the turret about the relative bearing axis Z, independently of the number of rotations of the turret 102 relative to the chassis 101.

The vehicle 100 includes a device 1 for distributing air-conditioning air that allows fresh air produced in the chassis

101 and blown into a first duct 11 of the device 1 to be transmitted. The fresh air is then expelled from the device 1 into the turret 102 via a second duct 12. The device 1 will be shown in greater detail in the following figures.

5 In Figure 2, it can be seen that the electrical rotating joint 10 includes a stator 10a secured to the chassis 101 and a rotor 10b secured to the turret 102. One pivots relative to the other about the relative bearing axis Z of the turret 102. The rotor 10b and the stator 10a are separated by a mounting
10 plane 10c.

The device 1 includes a cover 4, which is secured to the rotor 10b and forms a chamber 4 delimiting a volume in which the rotor 10b is housed. In the embodiment shown, the cover 4 covers the rotor 10b and is secured to the turret 102.

15 Side walls of the cover 4 are secured to a first disc 5 that is parallel to the mounting plane 10c and centered on the relative bearing axis Z. This first disc 5 is better shown in Figures 3 to 5.

As shown in Figure 2, the device includes a second disc 6
20 that is parallel to and coaxial with the first disc 5 and is located facing the first disc. The two discs 5 and 6 have the same diameter and are substantially pressed up against one another with the interposition of a sealing means 7 adjacent to their respective circumference. For example, the sealing
25 means 7 may be a lip seal 7 that enables the discs 5 and 6 to pivot relative to one another.

The second disc 6 is secured to the stator 10a, which itself is secured to the chassis 101. The securing of the stator 10a and the second disc 6 is airtight.

30 It should be noted in Figure 2 and Figure 3 that the side walls of the cover 4 are located at a distance D from the side walls of the rotor 10b, thus defining, in the internal volume of the chamber formed by the cover 4, a channel G for the circulation of air directly around the electrical rotating

joint 10. The second disc 6 and the stator 10a seal the cover 4 and thus the channel G. The channel G has a rectangular cross-section, given the geometries of the chamber and the rotor 10b.

5 The second disc 6 includes an air inlet (Figure 2) adjoining the stator 10a. The distance D between the side walls of the cover/chamber 4 and the walls of the rotor 10b should be selected such that the air inlet 3 always includes part of its section S that opens into the channel G, i.e.
10 between the walls of the cover/chamber 4 and the walls of the rotor 10b, in all angular orientations of the turret 101 relative to the chassis 102. Specifically, this is always ensured when the first disc 5 and the second disc 6 have substantially the same diameter, or at least when the second
15 disc 6 has a diameter greater than the internal diagonal of the chamber 4 whilst having a diameter that is nonetheless sufficient to receive the sealing means 7 between the two discs 5 and 6.

At least one air outlet 2 is provided in the bottom wall
20 of the chamber/cover 4 or in one of the side walls of the chamber/cover 4.

As shown in Figure 3, the air inlet 3 has an L shape delimited in part by the stator 10a. This air inlet has a maximum section S that is hatched in Figure 3.

25 Given the polygonal shapes of the rotating joint 10 and the channel G surrounding it, which are shown in Figures 3 to 5 for various orientations of the rotor 10b relative to the stator 10a, the section S of the air inlet 3 (hatched) may vary, but it always enables air to penetrate into the channel
30 G.

Arranging the discs 5 and 6 to face one another prevents air leaks at the channel G or at the air inlet 3. Thus, in Figure 4, the channel G is facing a part P of the second disc 6, thus preventing air from escaping the channel G. On the

same principle, a part K of the first disc 5 is facing part of the air inlet 3 to prevent air leaking out of the device 1.

Advantageously, the direct circulation of air around the walls of the rotor 10b enables an effective cooling thereof.

5 It should be noted that the channel G is traversed by electrical conductors 16 that benefit from the circulation of fresh air in the channel G. Electrical conductors 15 connected to the stator, in turn, benefit from the air conditioning of the chassis 101.

10 As shown in Figure 1, air ducts 13 and 14 are respectively connected to the air inlet 11 and the air outlet 12 of the device 1 to facilitate movement of fresh air from an air conditioner 111, located in the chassis 101, to equipment 112 located inside the turret 102.

15 Thus, the invention ensures continuity of air distribution between a chassis and a turret in all orientations of the turret relative to the chassis whilst occupying a minimum of space around the electrical rotating joint.

CLAIMS

1. Device (1) for distributing air-conditioning air for a turret (102) of a vehicle (100) that is rotatably mounted relative to a chassis (101) of the vehicle, the device (1) comprising a rotating joint (10) intended for electrically connecting the turret (102) and the chassis (101) of the vehicle (100) and to be coaxial with the turret (102), the rotating joint (10) including a stator (10a) intended to be secured to the chassis (101) and a rotor (10b) intended to be secured to the turret (102), wherein the device (1) is characterized in that it includes a cover (4) that forms a chamber delimiting a volume in which the rotor (10b) is housed and that is perforated by at least one air outlet (2), wherein the cover (4) is secured in an airtight fashion to the rotor (10b), wherein the cover (4) is located at the center of a first disc (5) to which the edges of the side walls of the cover (4) are secured, the device (1) includes a second disc (6) which is pressed against the first disc (5) with a sealing means (7) interposed therebetween, wherein the second disc (6) has substantially the same diameter as the first disc (5), is coaxial with it and is secured to the stator (10a), and can thus rotate in an airtight fashion relative to the first disc (5) and seals the chamber delimited by the cover (4), wherein the second disc (6) includes an air inlet (3) provided near the stator (10a), wherein the side walls of the cover (4) are located at such a distance (D) from the rotor (10b) that the air inlet (3) provided in the second disc (6) is always at least partly open into the volume of the chamber in all angular orientations of the rotor (10b) relative to the stator (10a).

2. The device (1) for distributing air according to claim 1, characterized in that the air inlet (3) has an L shape delimited in part by the stator (10a).

3. The device (1) for distributing air according to any one of claims 1 and 2, characterized in that the rotor (10b) is secured to a bottom wall of the cover (4).

5 4. The device (1) for distributing air according to any one of claims 1 to 3, characterized in that at least one air outlet (2) of the one or more air outlets (2) is provided at one of the side walls of the cover (4).

10 5. The device (1) for distributing air according to any any one of claims 1 to 4, characterized in that at least one air outlet (2) of the one or more air outlets (2) is provided at a bottom wall of the cover (4).