In a seat air conditioning unit, a first blower is mounted to a seat cushion and a second blower is mounted to a seat back such that a suction port of the second blower is located on a rear side of the seat back. A duct is provided for leading air blown by the first blower toward the suction port of the second blower. Further, a Peltier module is provided in the duct. A first end of the duct is connected to a discharge portion of the first blower and a second end of the duct defines a duct opening. The duct opening is disposed to open at a position adjacent to the suction port so that a volume of air sucked in the suction port is larger than a volume of air discharged from the duct opening toward the suction port.
FIG. 3

31  SEAT TEMP. SENSOR
32  FRONT A/C ECU
30  SEAT A/C ECU
     |   1st BLOWER 6
     |   2nd BLOWER 13
     |   1st PELTIER 8
     |   2nd PELTIER 20
     |   DOOR 21

FIG. 4

START
S100  COOL DOWN REQUIRED?
      |   NO
      |   YES
      |   1st BLOWER, 2nd BLOWER ON S120
      |   1st PELTIER, 2nd PELTIER ON S130
      |   NO COOL DOWN FINISHES S140
      |   YES
      |   2nd PELTIER OFF S160
      |   DOOR CLOSE S150
      |   REGULAR OPERATION S170
SEAT AIR CONDITIONING UNIT

CROSS REFERENCE TO RELATED APPLICATION


FIELD OF THE INVENTION

[0002] The present invention relates to a seat air conditioning unit that blows air from a seat surface.

BACKGROUND OF THE INVENTION

[0003] It is conventionally known to blow a conditioned air from a surface of a seat back toward a hip or back of a person sitting on a seat. For example, in a seat air conditioning unit disclosed in Japanese Unexamined Patent Publication No. 2004-215748 (U.S. Pat. No. 6,928,829), air produced by a blower unit that is mounted in a seat cushion is introduced to a Peltier module mounted in the seat back through a long duct. The air is heated or cooled through the Peltier module and then is blown to the surface of the seat back.

[0004] In this air conditioning unit, since the duct is mounted in the seat back, it is difficult to increase a diameter or a size of the duct. Also, approximately half of air having passed through the Peltier module is dispersed as to waste heat and the remaining half of the air is blown to the surface of the seat back. Therefore, the volume of air blown to the seat surface is limited.

[0005] In another type of seat air conditioning unit, for example, disclosed in Japanese Unexamined Patent Publication No. 2003-252036, a Peltier module and a blower unit are integrated and mounted in the seat back. This air conditioning unit does not have a duct to supply air to the Peltier module. Accordingly, a large volume of air can be blown to the seat surface, as compared to the above first air conditioning unit.

[0006] Further, a seat air conditioning unit disclosed in Japanese Unexamined Patent Publication No. 2003-285628 (U.S. Pat. No. 6,848,742) does not have a Peltier module in the seat back. A large volume of air is blown to the seat surface by a blower unit mounted in the seat back without dispersion. However, because the air blown from the seat back is not heated or cooled, it does not provide a cooling and heating effect.

SUMMARY OF THE INVENTION

[0007] The present invention is made in view of the foregoing matter, and it is an object of the present invention to provide a seat air conditioning unit capable of blowing a sufficient volume of air from a seat surface of a seat back with a heating and cooling effect.

[0008] According to an aspect of the seat air conditioning unit, a first blower is mounted to a seat cushion for blowing air to a surface of the seat cushion through an opening formed on the seat cushion. A second blower is mounted to a seat back of the seat such that a suction port thereof is open on a rear side of the seat back and air sucked in the suction port is blown to a surface of the seat back through an opening formed on the seat back. A duct is provided to lead air produced by the first blower toward the second blower. The duct encloses a Peltier module therein. A first end of the duct is connected to the discharge portion of the first blower and a second end of the duct is located adjacent to the suction port of the second blower. Further, the second end of the duct defines a duct opening. The duct opening is disposed adjacent to the suction port of the second blower so that a volume of air sucked in the section port is larger than a volume of air discharged from the duct opening toward the suction port.

[0009] Accordingly, the air, which has passed through the Peltier module in the duct and discharged from the duct opening, is sucked in the suction port of the second blower. Further, the second blower sucks air, in addition to the air discharged from the duct opening. Thus, a sufficient volume of air having a heating and cooling effect is blown from the seat back.

[0010] According to a second aspect of the present invention, a blower is mounted to a seat back of the seat such that a suction port thereof is located on a rear side of the seat back. A duct is disposed on the rear side of the seat back for introducing air toward the blower. The duct defines a duct opening at a position adjacent to the suction port of the blower. A Peltier module is disposed in the duct. Further, a back board is mounted to the rear side of the seat back, wherein the back board defines a space with the rear side of the seat back and an opening to allow air to flow in the space. The suction port and the duct opening are open in the space.

[0011] Accordingly, the blower sucks air discharged from the duct opening and air existing in the space. Therefore, a large volume of air is blown to the surface of the seat back.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Other objects, features and advantages of the present invention will become more apparent from the following detailed description made with reference to the accompanying drawings, in which like parts are designated by like reference numbers and in which:

[0013] FIG. 1 is a schematic view of a seat air conditioning unit according to a first example embodiment of the present invention;

[0014] FIG. 2 is a perspective view of a second blower unit and a duct of the seat air conditioning unit according to the first example embodiment;

[0015] FIG. 3 is a schematic diagram of an electric control unit of the seat air conditioning unit according to the first example embodiment;

[0016] FIG. 4 is a flowchart for showing a control operation of the seat air conditioning unit according to the first example embodiment;

[0017] FIG. 5 is a diagram for explaining air distribution in a cool down operation of the seat air conditioning unit according to the first example embodiment;

[0018] FIG. 6 is a diagram for explaining air distribution in a regular operation of the seat air conditioning unit according to the first example embodiment;

[0019] FIG. 7 is a schematic view of a part of the seat air conditioning unit according to a second example embodiment of the present invention; and
[0020] FIG. 8 is a perspective view of the second blower unit with a guide member according to another example embodiment of the present invention.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENT

[0021] A first example embodiment of the present invention will now be described with reference to FIGS. 1 to 6. In the drawings, arrows denote flow directions of air. As shown in FIG. 1, a seat air conditioning unit 1 of the first example embodiment has a first blower unit 6 and a second blower unit 13. The first blower unit 6 is mounted to a seat cushion 2 of a seat for producing a flow of air toward a surface 3 of the seat cushion 2. The second blower unit 13 is mounted to a seat back 9 of the seat for blowing air toward a surface 10 of the seat back 9.

[0022] The first blower unit 6 is for example arranged under a cushion member 4 of the seat cushion 2. A first Peltier module 8 is mounted in the seat cushion 2. A first duct 7 is connected to a discharge portion of the first blower unit 6. Air produced by the first blower unit 6 is introduced to the first Peltier module 8 through the first duct 7. The air is heated or cooled through the first Peltier module 8, and then blown toward the surface 3 through an opening 5 formed in the seat cushion 2. The seat surface 3 is for example formed of a breathable cover member. In the seat back 9, a second Peltier module 20 is mounted.

[0023] Each of the first Peltier module 8 and the second Peltier module 20 have a Peltier element defining a heat radiating side and a heat absorbing side. The heat radiating side and the heat absorbing side are switched according to a flow direction of electric current supplied to the Peltier element. Thus, the air passing through the Peltier module 8, 20 is heated or cooled. Namely, the Peltier module 8, 20 can be used for both heating and cooling air by changing the flow direction of the electric current in the Peltier element. The air introduced to one side of the Peltier module 8, 20 is not used for a seat air conditioning operation. Namely, approximately half of the air introduced in the Peltier module 8, 20 is discharged to a position without affecting the air conditioning operation as a waste heat.

[0024] The second blower unit 13 is arranged in a cushion member 11 of the seat back 9 so that a suction port 14 of the second blower unit 13 opens on a rear side 15 of the cushion member 11. The second blower unit 13 sucks air from the suction port 14 and blows it toward the seat surface 10 through an opening 12 formed in the seat back 9. Similar to the surface 3 of the seat cushion 2, the surface 10 of the seat back 9 is made of a breathable cover member.

[0025] The rear side 15 of the seat back 9 is covered with a back board 16. The back board 16 defines a space between itself and the rear side 15 of the seat back 9. A second duct 18 is provided on the rear side 15 of the seat back 9 in the space defined by the back board 16. An upstream end 18a of the second duct 18 is connected to the discharge portion of the first blower unit 6. The second duct 18 extends upward from the discharge portion of the first blower unit 6 toward the second blower unit 13. A downstream end of the second duct 18 defines a duct opening 19. As shown in FIG. 2, the duct opening 19 opens at a position adjacent to the suction port 14 of the second blower unit 13, in the space defined by the back board 16.

[0026] Further, a ventilation opening 17 is formed at a lower portion of the seat back 9, around the second duct 18. For example, the ventilation opening 17 is formed between the second duct 18 and the back board 16 and between the rear side 15 and the second duct 18. Air (e.g., inside air in a compartment) around the seat back 9 is introduced in the space defined in the back board 16 through the ventilation opening 17. Namely, the second duct 18 is disposed such that the volume of air sucked in the suction port 14 is larger than the volume of air discharged from the duct opening 19 toward the suction port 14.

[0027] The second Peltier module 20 is disposed adjacent to the duct opening 19 in the second duct 18. The second Peltier module 20 performs heat exchange with the air passing through the second duct 18. Accordingly, the air introduced in the second duct 18 from the first blower unit 6 is heated or cooled while passing through the second Peltier module 20 and blown from the duct opening 19 toward the suction port 14 as a conditioned air.

[0028] With the operation of the second blower unit 13, an upstream position of the suction port 14 is negatively pressurized. Thus, the conditioned air blown from the duct opening 19 is sucked in the second blower unit 13. Further, air that flows in the space through the ventilation opening 17 and reaches around the suction port 14 is also sucked in the second blower unit 13.

[0029] The conditioned air from the second duct 18 and the inside air introduced in the space through the ventilation opening 17 are mixed and blown by the second blower unit 13. Accordingly, a sufficient volume of air is blown to the seat back opening 12, while reducing an effect of pressure loss.

[0030] In the second duct 18, a ventilation door 21 is provided adjacent to the upstream end 18a. The position/ open degree of the door 21 is controlled through an actuator (not shown). A flow rate of air in the second duct 18 is controlled according to the position of the door 21. When the door 21 is operated to a fully open position as shown in a solid line in FIG. 1, an air flow resistance in the second duct 18 is minimum, that is, the flow rate of air in the second duct 18 is maximum. When the door 21 is operated to a fully closed position as shown in a dotted line in FIG. 1, the second duct 18 is fully closed so that the flow rate of air in the second duct 18 is zero. Also, when the door 21 is operated to a position between the fully closed position and the fully open position, the flow rate of air is set accordingly.

[0031] When the door 21 is at the fully closed position, the air blown by the first blower unit 6 is fully introduced to the first Peltier module 8 through the first duct 7. On the contrary, when the door 21 is at the fully open position, the air blown by the first blower unit 6 is partly introduced into the second duct 18 and the remaining air is introduced to the first Peltier module 8 through the first duct 7.

[0032] Next, control operation of the seat air conditioning unit 1 of the first example embodiment will be described. The seat air conditioning unit 1 has a seat air conditioner ECU (hereafter, seat a/c ECU) 30 as a control means. The seat a/c ECU 30 is composed of a microcomputer and peripheral circuits.

[0033] As shown in FIG. 3, a seat temperature sensor 31 and an air conditioner ECU (hereafter, front a/c ECU) 32 are
connected to inlet ports of the seat a/c ECU 30. The seat temperature sensor 31 is arranged at an appropriate position in the cushion member 4, 11. The seat temperature sensor 31 detects the temperature of the cushion member 4 or 11 as a representative seat temperature. Further, the seat temperature sensor 31 outputs the detected seat temperature as in a detection signal to the seat a/c ECU 30.

[0034] The front a/c ECU 32 is a control device of a front air conditioning unit disposed at a front part of the compartment. In the first example embodiment, the front a/c ECU 32 outputs signals relating to inside air temperature, outside air temperature, the quantity of solar radiation and a target blowing air temperature TAO, which are used in a control operation of the front a/c unit, to the ECU 30.

[0035] The seat a/c ECU 30 is connected to the first blower unit 6, the second blower unit 13, the first Peltier module 8, the second Peltier module 20 and the door 21. The seat a/c ECU 30 operates motors of the first blower unit 6 and the second blower unit 13 in duty system control, respectively, to produce the necessary volume of air.

[0036] The seat a/c ECU 30 controls ON-OFF operation of the Peltier modules 8, 20. Namely, the seat a/c ECU 30 controls electric current supply to the Peltier elements of the Peltier modules 8, 20. Also, the seat a/c ECU 30 controls the direction of the electric current supplied to the Peltier elements, thereby to control the cooling or heating operation in the Peltier modules 8, 20. Further, the seat a/c ECU 30 operates the actuator (not shown) of the door 21 for rotating the door 21 to the predetermined position.

[0037] Next, operation of the seat air conditioning unit 1 will be described with reference to FIG. 4. FIG. 4 shows a control operation performed by the seat a/c ECU 30. The control operation is started when the electric power supply to the seat air conditioner ECU 30 is started. The control operation is repeated in a predetermined cycle.

[0038] First, at a step S100, it is determined whether a cool down operation is necessary. When the seat temperature detected by the seat temperature sensor 31 is equal to or higher than a threshold value, it is determined that the cool down operation is necessary. Namely, it is determined that it is necessary to immediately reduce the seat temperature.

[0039] Alternatively, at the step S100, the necessity of the cool down operation can be determined based on one or some of other physical values such as the inside air temperature, the outside air temperature, the quantity of solar radiation and the target blowing air temperature TAO outputted from the ECU 32. When the front air conditioning unit is operated in a manual mode, it can be determined that the cool down operation is necessary at a timing shortly after a cooling operation is selected in the front air conditioning unit.

[0040] When it is determined that the cool down operation is not necessary, the control operation proceeds to a step S170. At the step S170, a regular operation of the seat air conditioning unit 1 is performed. When it is determined that the cool down operation is necessary, the control operation proceeds to a step S110. At the step S110, the door 21 is operated to the fully open position.

[0041] Then, at a step S120, a fan of the first blower unit 6 and a fan of the second blower unit 13 are operated at the maximum level, respectively. At a step S130, the electric current is supplied to the first Peltier module 8 and the second Peltier module 20.

[0042] In this condition, air flows in the seat air conditioning unit 1 as shown in FIG. 5. In FIG. 5, each numeral in a parenthesis denotes a ratio of air volume at an illustrated position to an air volume introduced in the second duct 18 from the first blower unit 6. The volume ratio of air blown by the first blower unit 6 is 3, and the volume ratio of air blown by the second blower unit 13 is 1.5. The volume of air discharged from each of the Peltier module 8, 20 is half of the volume of air passing through the Peltier module 8, 20. Here, it is assumed that there is no pressure loss and air leakage in respective positions.

[0043] When the volume ratio of air produced by the first blower unit 6 is 3, the volume ratio of air introduced to the second duct 18 is 1 and the volume ratio of air introduced to the first Peltier module 8 is 2 in a condition that the door 21 is at the fully open position. In the first Peltier module 8, approximately half of the air is cooled, and the cooled air is blown toward the seat surface 3 of the seat cushion 2 through the seat cushion opening 5. Namely, the volume ratio of air introduced to the seat cushion opening 5 of the seat cushion 2 is 1.

[0044] In the second Peltier module 20, approximately half of the air introduced in the second duct 18 is cooled, and is blown from the duct opening 19. The second blower unit 13 sucks the cooled air discharged from the duct opening 19 with the volume ratio of 0.5 and the inside air introduced from the ventilation opening 17 with the volume ratio of 1. The cooled air and the inside air are mixed and blown to the surface 10 through the seat back opening 12 by the second blower unit 13. Namely, the volume ratio of air blown to the seat surface 10 of the seat back 2 is 1.5.

[0045] Accordingly, in the seat back 9, the air produced from the second blower unit 13 is blown to the back of a person sitting on the seat through the seat surface 10 with a maximum volume. Further, the air blown by the second blower unit 13 contains the cooled air having passed through the second Peltier module 20. Therefore, a large volume of air having a cooling effect is blown from the surface 10 to cool the seat back 9, in the cool down operation.

[0046] Namely, the volume of air blown from the seat surface 10 is increased by the air introduced in the space from the ventilation opening 17. With this, the volume of air introduced to the second Peltier module 20 is reduced. Accordingly, the second duct 18 can be narrowed. Furthermore, since the volume of air introduced to the second duct 8 from the first blower unit 6 is reduced, the volume of air blown from the seat cushion 2 is increased without increasing a size of the first blower unit 6 more than necessary. Namely, the volume of air blown from the seat cushion 2 is ensured with a relatively small, low performance blower.

[0047] At a step S140, it is determined whether the cool down operation is unnecessary. Namely, it is determined whether to terminate the cool down operation. For example, when the seat temperature detected by the seat temperature sensor 31 is lower than the threshold value, it is determined that the cool down operation is not necessary.

[0048] Alternatively, the termination of the cool down operation is determined based on one of or some of other
physical values such as the inside air temperature, the outside air temperature, the quantity of solar radiation and the target air blow temperature TAO outputted from the front a/e ECU 32. When the front air conditioner is operated in the manual mode, the timing of terminating the cool down operation can be determined at a timing when a predetermined time period has elapsed after the start of the cool down operation at the step S100.

[0049] When it is determined that the cool down operation is still necessary at the step S140, the control operation returns to the step S110 to continue the cool down operation. When the termination of the cool down operation is determined, the control operation proceeds to the step S150. At the step S150, the door 21 is operated to the fully closed position.

[0050] At the same time, the electric current supply to the second Peltier module 20 is stopped at a step S160. If the electric current is supplied to the Peltier module in a condition that air is not introduced to the Peltier module, the Peltier element is likely to be broken. Since the electric current supply to the Peltier module 20 is stopped at the same time as closing the door 21, it is less likely that the Peltier element will be broken.

[0051] Then, at a step S170, the regular operation of the seat air conditioning unit 1 is performed. In the regular operation, the first blower unit 6 and the first Peltier module 8 are controlled to produce a predetermined cooling effect required in the seat cushion 2. In the seat back 9, the second blower unit 13 is controlled to blow the inside air so that unnecessary cold feeling at the back of the user is reduced.

[0052] In the regular operation after the termination of the cool down operation, air flows in the seat air conditioning unit 1 as shown in FIG. 6. Similar to FIG. 5, the volume ratio of air blown by the first blower unit 6 is defined as 3. The volume ratio of air blown by the second blower unit 13 is 1.5. Also, a half of air having passed through each Peltier module 8, 20 is discharged as dissused air. Also, it is assumed that there is no pressure loss and air leakage.

[0053] Further, the air blown by the first blower unit 6 is fully introduced to the first Peltier module 8 without flowing in the second duct 18. A half of the air introduced to the Peltier module 8 is cooled and blown to the seat surface 3 of the seat cushion 2 through the seat cushion opening 5. Namely, the volume ratio of cooled air blown from the seat surface 3 is 1.5.

[0054] The volume of air discharged from the duct opening 19 of the second duct 18 is zero. Thus, the air introduced in the space of the back board 16 from the opening 17 is only sucked in the second blower unit 13 from the suction port 14 with the volume ratio of 1.5.

[0055] Accordingly, since the air is not introduced to the second duct 18 in the regular operation, the air produced by the first blower unit 6 is fully introduced to the first Peltier module 8. In the seat back 9, the inside air introduced from the ventilation opening 17 is blown to the seat surface 10. The volume of the inside air blown to the seat surface 10 is controlled independently or irrespective to the volume of air blown by the first blower unit 6.

[0056] Next, a second example embodiment will be described with reference to FIG. 7. In the second example embodiment, the seat air conditioning unit 1 has a guide member 22 in addition to the structure of the first example embodiment. Structure other than the guide member 22 is similar to that of the first example embodiment. The guide member 22 is disposed at the duct opening 19 of the second duct 18.

[0057] As shown in FIG. 7, the opening 19 of the second duct 18 is open in the space defined in the back board 16, at a position adjacent to the suction port 14, similar to the first example embodiment. The guide member 22 is formed to extend from the surface of the back board 16, the surface facing the seat back 9. For example, the guide member 22 is integrally molded with the resinos back board 16.

[0058] The guide member 22 has a shape to guide air to the suction port 14 of the second blower unit 13. For example, the guide member 22 has a substantially rectangular plate shape, and is bent to have a recessed portion on one side.

[0059] Also, the guide member 22 is shaped so that the end 22a of the guide member 22 is located adjacent to an end 14a of the suction port 14 when the back board 16 is mounted on the seat back 9. The end 14a is on a side opposite to a side that is located adjacent to the opening 19. Accordingly, when the seat air conditioning unit 1 is assembled, the guide member 22 is easily arranged to an appropriate position with respect to the duct opening 19 and the suction port 14.

[0060] Accordingly, the air blown from the duct opening 19 is effectively introduced to the suction port 14 of the second blower unit 13. Further, the sides 22b of the guide member 22 are open in the transverse direction of the seat. Accordingly, the inside air introduced from the ventilation opening 17 and exists around the sides 22b is sucked into the second blower unit 13.

[0061] Alternatively, the guide member 22 can be formed to extend from the downstream end of the second duct 18, as shown in FIG. 8. Further, the guide member 22 can be formed to extend from the perimeter of the suction port 14 of the second blower unit 13.

[0062] In the above example embodiments, since the door 12 is provided in the second duct 18 for controlling a flow rate of air in the second duct 18, the cooling or heating effect of the air blown by the second blower unit 13 can be controlled.

[0063] Further, when the cool down operation is not necessary, the door 12 is closed and the electric current supply to the second Peltier module 20 is stopped. Since the air without having the cooling effect is blown from the second blower unit 13, it is less likely that the back of the user, which is generally sensitive to coldness, will be cooled more than necessary. Accordingly, a comfortable air conditioning feeling is provided.

[0064] In the above example embodiments, the back board 16 covers the suction port 14 of the second blower unit 13. Thus, it is less likely that a temperature of air to be sucked in the suction port 14 will be immediately changed.

[0065] In the above example embodiments, the control operation is described based on the cooling down operation. When the seat surface is cold, a heating operation is per-
formed in a similar manner by supplying the electric current to the Peltier element in the opposite direction.

[0066] Further, the openings 5, 12 formed on the cushion members 4, 11 are not limited to the illustrated shapes. For example, the openings 5, 12 can be divided into plural openings over the cushion members 4, 11.

[0067] The example embodiments of the present invention are described above. However, the present invention is not limited to the above example embodiments, but may be implemented in other ways without departing from the spirit of the invention.

What is claimed is:

1. A seat air conditioning unit for blowing air from a surface of a seat cushion and a surface of a seat back, the seat air conditioning unit comprising:
   a first blower mounted to the seat cushion for blowing air to the surface of the seat cushion through an opening formed on the seat cushion;
   a second blower defining a suction port, the second blower mounted to the seat back so that the suction port is open on a rear side of the seat back and air sucked in the suction port is blown to the surface of the seat back through an opening formed on the seat back;
   a duct having a first end and a second end, the first end connected to a discharge portion of the first blower and the second end disposed adjacent to the suction port of the second blower for introducing air blown by the first blower toward the second blower; and
   a Peltier module disposed in the duct, wherein
   the second end of the duct defines a duct opening, and the duct opening is disposed adjacent to the suction port of the second blower such that a volume of air sucked in the suction port is larger than a volume of air discharged from the duct opening toward the suction port.
2. The seat air conditioning unit according to claim 1, further comprising:
   a guide member disposed adjacent to the suction port of the second blower for leading air from the duct opening toward the suction port.
3. The seat air conditioning unit according to claim 2, further comprising:
   a back board mounted to the rear side of the seat back to surround the suction port of the second blower and the second end of the duct, wherein the guide member is provided on a wall of the back board that faces the rear side of the seat back.
4. The seat air conditioning unit according to claim 1, further comprising a door disposed in the duct for controlling a flow rate of air in the duct.
5. The seat air conditioning unit according to claim 4, further comprising:
   a control unit that controls an electric current supply to the Peltier module and an operation of the door and determines whether a predetermined operation is necessary, wherein
   when it is determined that the predetermined operation is necessary, the door is operated to a fully open position to allow air to flow in the duct and an electric current is supplied to the Peltier module.
6. The seat air conditioning unit according to claim 5, wherein when it is determined that the predetermined operation is unnecessary, the door is operated to a fully closed position to close the duct and the electric current supply to the Peltier module is stopped.
7. The seat air conditioning unit according to claim 5, wherein the predetermined operation is a cool down operation for blowing air having a cooling effect to the surface of the seat back.
8. The seat air conditioning unit according to claim 1, further comprising:
   another Peltier module disposed between the discharge portion of the first blower and the opening of the seat cushion.
9. The seat air conditioning unit according to claim 1; further comprising:
   a back board mounted to the rear side of the seat back, wherein
   the back board defines a space with the rear side of the seat back and the duct opening is open in the space, and
   the back board further defines an opening so that air around the seat back and the back board is introduced in the space.
10. The seat air conditioning unit according to claim 2, wherein the guide member extends from at least one of an end of the suction port and the second end of the duct.
11. An air conditioning unit for a seat, comprising:
   a blower mounted to a seat back of the seat such that a suction port thereof is located on a rear side of the seat back;
   a duct disposed on the rear side of the seat back, the duct having a first end for introducing air therein and a second end defining a duct opening at a position adjacent to the suction port of the blower;
   a Peltier module disposed in the duct; and
   a back board mounted to the rear side of the seat back, wherein the back board defines a space with the rear side of the seat back and an opening to allow air to flow in the space, and
   the suction port and the duct opening are open in the space.

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