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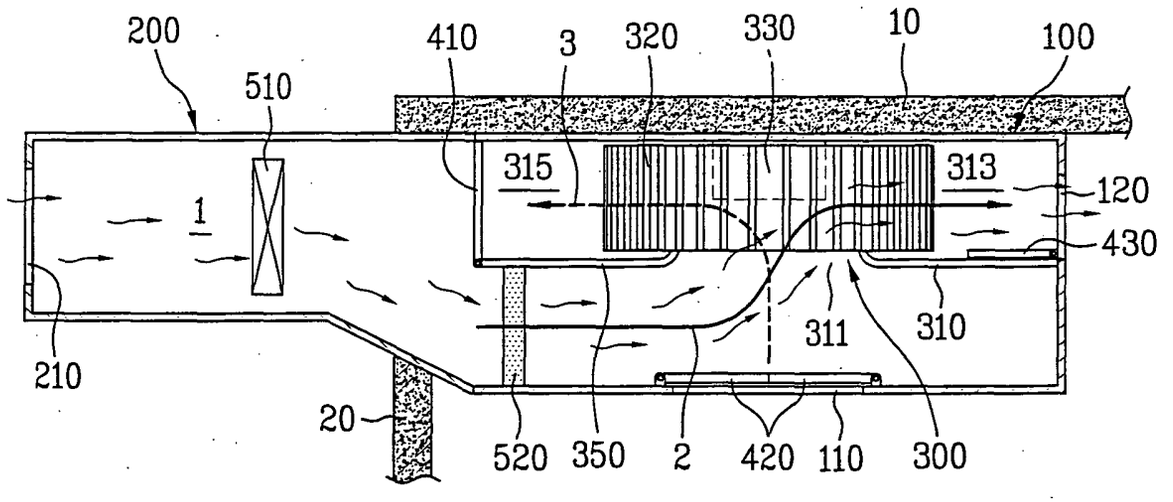
(54) Ventilating system

(57) Disclosed is to a ventilating system for supplying the outdoor air to the inside of a room or discharging the indoor air to the outside of a room. The ventilating system comprises a case having an inlet and an outlet fluid-communicated with the inside of a room. The case is fluid-communicated with the outside of the room through a first flow passageway. A second flow passageway is provided inside the case so as to fluid-communicate the outlet with the first flow passageway. A third flow passageway is provided inside the case so as to fluid-communicate the inlet with the first flow passageway. The case is provided with a fan unit, which functions to suction the indoor air through the third flow passageway and exhaust to the outside of the room through the first flow passageway, or to suction the outside air through the first and second flow passageway and supply into the inside of the room. A first damper is disposed between the outside of the room and the fan unit so as to open alternately the second or third flow passageway.

FIG. 1



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a ventilating system for supplying outdoor air to the inside of a room or exhausting indoor air to the outside of a room.

Background of the Related Art

[0002] The air in a closed room is gradually contaminated over time, due to the breathing, etc. by people inside the room. Thus, the contaminated air needs to be replaced frequently with the fresh outdoor air through a ventilating system or the like.

[0003] A common-type ventilating system is comprised of an air-supply fan for supplying the outdoor air into the inside of a room, an air-supply duct for guiding the outdoor air into the case of the ventilating system, an exhaust fan for exhausting the indoor air to the outside of the room, and an exhaust duct for guiding the indoor air into the outside. Here, the air-supply fan and the air-exhaust fan are commonly provided inside the case of the system and thus it leads to a bulky case of the system. In addition, the two fans and the two ducts increase the installation cost for the system. Furthermore, the conventional system uses two fans, which leads to a large amount of noise and also high power consumption.

SUMMARY OF THE INVENTION

[0004] Accordingly, the present invention has been made in order to solve the above problems in the art, and it is an object of the invention to provide a small and cost-effective ventilating system.

[0005] Another object of the invention is to provide a ventilating system, which can reduce the fan noise and the power consumption thereof.

[0006] In order to accomplish the above objects of the invention, according to one aspect of the invention, there is provided a ventilating system comprises: a case having an inlet and an outlet fluid-communicated with the inside of a room; a first flow passageway fluid-communicating the case with the outside of the room; a second flow passageway fluid-communicating the outlet with the first flow passageway, the second flow passageway being provided inside the case; a third flow passageway fluid-communicating the inlet with the first flow passageway, the third flow passageway being provided inside the case; a fan unit suctioning an indoor air through the third flow passageway and exhausting to the outside of the room through the first flow passageway, or suctioning an outdoor air through the first and second flow passageways and supplying into the inside of the room, the fan unit being provided inside the case; and a first damper opening alternately the second flow passageway and the third flow passageway; the first damper being disposed between the outside of the room and the fan unit.

[0007] The fan unit suctions the air in an axial direction and discharges it in a radial direction. The case may be provided in a ceiling.

[0008] In the above ventilating system, the second flow passageway and the third flow passageway are fluid-communicated with each other inside the case, and the fan unit is installed so as to suction the air through a point where the second and third flow passageways are fluid-communicatively connected to each other.

[0009] The fan unit comprises: a scroll casing provided inside the case; a fan provided inside the scroll casing; a common inlet, through which the outdoor air flowing the second flow passageway or the indoor air flowing the third flow passageway is in-flown, the common inlet being provided in the scroll casing; a first outlet fluid-communicated with the outlet of the case and provided in the scroll casing; and a second outlet fluid-communicated with the first flow passageway and provided in the scroll casing.

[0010] The fan suctions the air in-flown through the common inlet in an axial direction and thereafter discharges it in a radial direction towards the first outlet and the second outlet. The common inlet is disposed so as to be fluid-communicated with the connection portion of the first flow passageway and the second flow passageway and the inlet of the case.

[0011] The ventilating system of the invention may further comprise a partition plate dividing the inner space of the case into two spaces. The partition plate is provided inside the case. The fan unit is installed in such a manner that it is disposed in either one of the two spaces and suctions air inside the other space and discharges it into the either one of the two spaces.

[0012] The ventilating system of the invention may further comprise a second damper selectively opening and closing the inlet. The second damper is provided in the case. In addition, the system may further comprise a third damper selectively opening and closing the outlet. The third damper is provided in the case. Furthermore, the system may further comprise a fourth damper opening the inlet and the outlet alternately. The fourth damper is provided inside the case.

[0013] In the above ventilating system, the inlet is provided in a bottom face of the case and the outlet is provided in a side face of the case. Alternatively, the inlet may be provided in the lateral lower side of the case and the outlet may be provided in the lateral upper side of the case.

[0014] The ventilating system of the invention may further comprise a heater heating the outdoor air being supplied into the inside of the room. The heater is provided in the first flow passageway. In addition, the system of the invention may further comprise a filter purifying the outdoor air being supplied into the inside of the

room. The filter is provided in the second flow passageway.

[0015] According to another aspect of the invention, there is provided a ventilating system comprises: a case having an inlet and an outlet fluid-communicated with the inside of a room; a duct fluid-communicating the case with the outside of the room and guiding an outdoor air into the case or an indoor air inside the case into the outside of the room alternately; a fan unit suctioning an air entered into the case and then exhausting toward the outlet and the duct, the fan unit being provided inside the case; and a first damper blocking alternately the indoor air being discharged from the fan unit toward the duct and the outdoor air being supplied from the duct into the fan unit, the first damper being disposed between the duct and the fan unit.

[0016] The fan unit includes: a common inlet fluid-communicated with the inlet of the case and the duct; a fan suctioning an air through the common inlet and then discharging it; a first outlet guiding the air, which is discharged from the fan, into the outlet of the case; and a second outlet guiding the air, which is discharged from the fan, into the duct.

[0017] The above ventilating system may further comprise a partition plate provided inside the case. The partition plate divides the inner space of the case into two spaces, through one of which the air enters the unit fan and through the other one of which the air exits from the fan unit. Here, the first damper is assembled to the partition plate so as to close alternately the two spaces divided by the partition plate.

[0018] The ventilating system of the invention may further comprise at least one additional damper, which closes the inlet and the outlet of the case separately or alternately.

[0019] According to another aspect of the invention, there is provided a ventilating system comprises: a case including an inlet and an outlet fluid-communicated with the inside of a room, a lower space fluid-communicated with the inlet, an upper space fluid-communicated with the outlet, and a common inlet fluid-communicating the upper space and the lower space; a duct fluid-communicating the upper and lower spaces of the case with the outside of the room; a fan suctioning an air of the lower space and discharging it towards the upper space, the fan being provided inside the case; and a first damper fluid-communicating the duct alternately with the upper space or the lower space, the first damper being provided between the outside of the room and the fan.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings:

[0021] FIG. 1 is a schematic diagram showing a ventilating system according to a first embodiment of the invention when the system is operated in an air-supply mode;

[0022] FIG. 2 is a perspective view showing the appearance of the ventilating system of FIG. 1;

[0023] FIG. 3 is a schematic diagram showing the ventilating system according to the first embodiment of the invention where the system is operated in an air-exhaust mode;

[0024] FIG. 4 is a schematic diagram showing a ventilating system according to a second embodiment of the invention where the system is operated in an air-supply mode;

[0025] FIG. 5 is a perspective view showing the appearance of the system of FIG. 4;

[0026] FIG. 6 is a schematic diagram of the ventilating system according to the second embodiment of the invention where the system is operated in an air-exhaust mode; and

[0027] FIG. 7 is a perspective view showing the appearance of the ventilating system of FIG. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. In the description, like elements are denoted by like reference numerals and explanation for identical elements will not be repeated.

[0029] FIGS. 1 to 3 illustrate a ventilating system according to a first embodiment of the invention. Referring to FIGS. 1 to 3, the ventilating system of the invention is provided with a case 100, which is to be placed in the inside of a room. For example, the case 100 has an angular corner so as to be installed in the corner of a ceiling 10, as shown in FIG. 2. The case 100 is installed in such a manner that the top face of the case 100 is closely contacted with the ceiling 10, and the two lateral face thereof extended from the angular corner are closely contacted with a wall 20 of the inside of the room. This structure is very useful in case where between the ceiling 10 and the upstairs bottom face does not provide an adequate space to install a ventilation system case and ducts.

[0030] The case 100 is provided with an inlet 110 and an outlet 120, which are fluid-communicated with the interior of the room. In the ventilating system of the first embodiment, the inlet 110 is provided in the bottom face of the case 100 as shown in FIG. 1, and the outlet 120 is provided in a side face of the case 100 so as to face the interior of the room as shown in FIG. 2. In the case 100, the side face facing the interior of the room may have a rounded face, and the outlet 120 is disposed such that air can be supplied into the inside of the room in various directions.

[0031] As described above, the case 100 is fluid-communicatively connected with the interior of the room through the inlet 110 and the outlet 120 and fluid-communicatively connected with the outside of the room through a first flow passageway 1, as illustrated in FIGS. 1 and 3. The first flow passageway 1 is defined by a duct 200 installed so as to pass through the wall 20, and one end thereof is fluid-communicated, for example, with the outside of the room and the other end thereof is connected with the case 100. At one end of the duct 200 is provided an opening 210 and a grill, through which the duct 200 is fluid-communicated with the outside of the room. The other end of the duct 200 is formed in such a way that its diameter is expanded gradually towards the case 100. Along the first flow passageway 1 defined by the duct 200, the outdoor air is flown inside the case 100, or the indoor air introduced into the case 100 through the inlet 110 is exhausted to the outside of the room.

[0032] Inside the case 100 is formed a second flow passageway 2 through which the outdoor air entered into the case 100 through the duct 100 is guided into the inside of the room, and a third flow passageway 3 through which the indoor air entered into the case 100 through the inlet 110 is guided into the duct 200. Here, the second flow passageway 2 fluid-communicates the first flow passageway 1 with the outlet 120, and the third flow passageway 3 fluid-communicates the first flow passageway 1 with the inlet 110.

[0033] As shown in FIGS. 1 and 3, the second and third flow passageways 2 and 3 are fluid-communicated and crossed with each other inside the case 100. In addition, a fan unit 300 is provided at the position where the second and third flow passageways 2 and 3 are fluid-communicated and crossed with each other. The fan unit 300 functions to suction the outdoor air through the first and second flow passageways 1 and 2 and supply it to the inside of the room, or suction the indoor air through the third flow passageway 3 and exhaust it to the outside of the room through the first flow passageway 1. The fan unit 300 will be further explained below, with reference to FIGS. 1 and 3.

[0034] The fan unit 300 is formed of a scroll casing 310 and a fan 330 provided inside the scroll casing 310. The scroll casing 310 is provided, for example, upwards of the inside of the case 100, and the bottom face of the scroll casing 310 divides the inside space of the case 100 into a lower space and an upper space. Here, the upper space and the lower space may be divided by a partition plate 350, instead of the scroll casing 310. In this case, the partition plate 350 is installed in such a way as to cross horizontally the inside of the case 100 and the scroll casing 310 is mounted approximately at the middle of the partition wall 350.

[0035] On the other hand, the lower space is fluid-communicated with the inlet 110 and the upper space is fluid-communicated with the outlet 120. In addition, both the upper space and the lower space are fluid-communicated with the duct 200 defining the first flow passageway 1. The upper space and the lower space is not completely partitioned, but fluid-communicated with each other through a common inlet 311 formed approximately at the center of the scroll casing 310. Here, the second flow passageway 2 for guiding the outdoor air into the inside of the room is led from the place where the first flow passageway 1 and the lower space meet each other, passing the common inlet 311, until the outlet 120. The third flow passageway 3 for guiding the indoor air into the outside of the room is led from the inlet 110 via the common inlet 311 until the place where the first flow passageway 1 and the upper space meet each other.

[0036] The fan 330 is provided inside the case 100 and functions to suction the air in the lower space and discharge into the upper space. More specifically, the fan 330 is disposed in the upper space and installed such that the air in the lower space is suctioned along the axial direction through the common inlet 311, where the second and third flow passageways 2 and 3 are fluid-communicated with each other, and discharge it along the radial direction. The side face of the scroll casing 310 surrounds the side face of the fan 330 provided in the upper space, and also guides the air, which is discharged along the radial direction from the fan 330, towards the outlet 120 of the case 100 and the first duct 200. For this purpose, in the lateral side of the scroll casing 31 are provided a first outlet 313 fluid-communicated with the outlet 120 of the case 100 and a second outlet 315 fluid-communicated with the first duct 200.

[0037] Between the fan unit 300 and the exterior of the room is provided a first damper 410, which fluid-communicates the duct 200 alternately with the upper space or the lower space. More specifically, the first damper 410 is mounted on the partition plate 350 or the scroll casing 310, and functions to open alternately the second flow passageway 2 and the third flow passageway 3. As illustrated in FIGS. 1 and 3, the first damper 410 is pivotably installed in the partition plate 350 and turned about a hinge to thereby open alternately the second flow passageway 2 and the third flow passageway 3. However, the invention is not limited to the above illustration. Alternatively, the partition plate 350 may be provided with a plurality of louvers installed in the upper and lower sides thereof so as to open selectively the second outlet 120 and the second flow passageway 2.

[0038] The first damper 410 installed as above closes the third flow passageway 3 formed in the upper space when the ventilating system is operated in an air-supply mode, as shown in FIG. 1. Then, as the fan 330 rotates, the outdoor air flows into the lower space of the case 100 through the first and second flow passageways 1 and 2, and the indoor air flows into the lower space through the inlet 110 and the third flow passageway 3. The outdoor air and the indoor air flown into the lower space is suctioned into the fan 330 through the common inlet 311, and thereafter discharged towards the first inlet 313 and the second inlet 315 in the upper space.

Here, since the second inlet 315 is blocked by the first damper 410, the discharged air is supplied into the inside of the room through the first outlet 120.

[0039] The first damper 410 closes the second flow passageway 2 formed in the lower space, as shown in FIG.3, when the ventilating system is operated in an air-exhaust mode. Then, as the fan 330 rotates, the indoor air flows into the lower space through the inlet 110 and the third flow passageway 3 and thereafter suctioned into the fan 330 through the common inlet 311. The air suctioned into the fan 330 is discharged towards the first inlet 313 and the second inlet 315 in the upper space. At this time, since the first inlet 313 and the second inlet 313 are both opened, the air discharged towards the first inlet 313 is supplied into the inside of the room, and air discharged towards the second outlet 120 is exhausted to the outside through the first flow passageway 1.

[0040] As described above, the first damper 410 controls the flow of the indoor air and the outdoor air when the ventilating system of the invention is operated in an air-supply mode and an air-exhaust mode. However, a good ventilating efficiency can not be achieved through the first damper 410 only. In other words, as described above, when in the air-supply mode, the indoor air, together with the outdoor air, is flown into the case 100 and supplied into the interior of the room, and thus a large amount of outdoor air can not be introduced into the inside of the room within a short period of time. In addition, when in the air-exhaust mode, part of the indoor air flown into the case 100 is exhausted into the outside of the room, and the remaining portion thereof is supplied back into the inside of the room. Accordingly, a large amount of indoor air cannot be exhausted to the outside in a short period of time. Thus, in order to solve this problem to thereby achieve a high ventilation efficiency, the case 100 is provided with a second damper 420 and a third damper 430 respectively in the inlet 110 and the outlet 120, as shown in FIGS. 1 and 3.

[0041] The second damper 420 is provided in the case 100 so as to open and close the inlet 110. More specifically, the second damper 420 closes the inlet 110 when the ventilating system is operated in an air-supply mode to supply the outdoor air inside the room, as shown in FIG. 1. As shown in FIG. 3, in an air-exhaust mode to exhaust the indoor air into the outside of the room, the second damper opens the inlet 110. In addition, the third damper 430 is provided in the case 100 so as to open and close the outlet 120. More specifically, the third damper 430 opens the outlet 120 in the air-supply mode as shown in FIG. 1, and closes the outlet 120 in the air-exhaust mode as shown in FIG. 3.

[0042] On the other hand, inside the duct 200, i.e., in the first flow passageway 1 is further provided a heater 510, as shown in FIGS. 1 and 3. The heater 510 heats the outdoor air being supplied into the inside of a room in winter time when the temperature of the outdoor air is lower, thereby enabling to supply an air having a temperature appropriate to the indoor. Furthermore, a filter 520 is further provided in the lower space of the case, specifically at the place where the second flow passageway 2 and the first flow passageway 1, as shown in FIGS. 1 and 3. The filter 520 functions to filter the outdoor air being supplied into the inside of a room, when the ventilating system of the invention is operated in an air-supply mode.

[0043] As described above, the ventilating system of first embodiment having the above construction is operated in an air-supply mode and in an air-exhaust mode, which will be further explained below, in greater detail.

[0044] In the air-supply mode, as shown in FIG. 1, the first damper 410 blocks the duct 200 from the upper space where the fan 330 is provided, the second damper 420 blocks the inlet 110, and the third damper 430 opens the outlet 120. If the fan 330 is operated, the outdoor air is flown into the case 100 through the first flow passageway 1. At this time, in case of winter-time, the heater 510 heats up the outdoor air passing through the duct 200.

[0045] Due to the first damper 410, the outdoor air entered into the case 100 flows into the second flow passageway 2 formed in the lower space and is purified by the filter 520 installed in the second flow passageway 2. In addition, the outdoor air flowing along the second flow passageway 2 is suctioned in the axial direction of the fan 330 through the common inlet 311. Then, the fan 330 discharges the suctioned outdoor air towards the outlet 120 and the duct 200. Here, since the first damper 410 blocks the outdoor air moving towards the duct 200 from the upper space, the outdoor air discharged from the fan 330 is supplied, in its entirety, into the inside of the room through the outlet 120.

[0046] In the air-exhaust mode, as shown in FIG. 3, the first damper 410 blocks the duct 200 from the lower space where the filter 520 is provided, and the second damper 420 opens the inlet 110 and closes the outlet 120. If the fan 330 is operated, the indoor air is flown into the case 100 through the inlet 110. The indoor air entered into the case 100 moves along the second flow passageway 2 and flows towards the fan 330 through the common inlet 311. Then, the fan 330 discharges the indoor air towards the duct 200 and the outlet 120. At this time, the outlet 120 is closed by the third damper 430 and thus the indoor air flown into the fan 330 is discharged, in its entirety, into the outside of the room through the duct 200, as shown in FIG. 3.

[0047] FIGS. 4 to 7 illustrate a ventilating system according to a second embodiment of the invention. As shown in the figures, the ventilating system of the second embodiment has generally the same structure as that of the first embodiment, excepting the inlet 110 of the case. That is, in the previous embodiment, the case 110 is provided in the bottom face of the case, but in this embodiment the inlet 110 is provided in a lateral face of the case 100. Hereafter, the structure of the second embodiment will be described, focusing on features different from the first embodiment.

[0048] As shown in FIGS. 4 and 5, the inlet 110 is provided at the lower side of a lateral face of the case 110, and the outlet is provided at the upper side of a lateral face of the case 100. The inlet 110 and the outlet 120 are both fluid-communicated with the inside of a room and separated from each other by the scroll casing 310 or the partition plate 350. In the ventilating system of the second embodiment, the inlet 110 and the outlet 120 are installed adjacent to each other in the same face of the case 100. Therefore, in the ventilating system according to the second embodiment, the inlet 110 and the outlet 120 can be opened alternately by a single damper, dissimilar to the first embodiment. For this purpose, inside the case 100 is provided an additional damper, i.e., a fourth damper 440 for opening alternately the outlet 120 and the inlet 110. On the other hand, the outlet 120 and the inlet 110 may be configured so as to be opened and closed separately by the two dampers, similar to the first embodiment.

[0049] In an air-supply mode, the first damper 410 fluid-communicates the duct 200 with the lower space of the case 100 and prevents the air discharged from the fan 330 from entering the duct 200, as illustrated in FIG. 4. As shown in FIGS. 4 and 5, the fourth damper 440 opens the outlet 120 and closes the inlet 110. When the fan unit 300 operates, the outdoor air are supplied into the inside of the room through the outlet 120 provided in a lateral face of the case 100 via the duct 200, the lower space, and the common inlet 311, as illustrated in FIG. 5.

[0050] In an air-exhaust mode, the first damper 410 blocks the lower space of the case 100 from the duct 200 and guides the air discharged from the fan 330 into the duct 200, as shown in FIG. 6. In addition, the fourth damper 440 closes the outlet 120 and opens the inlet 110, as shown in FIGS. 6 and 7. When the fan unit 300 is operated, the indoor air is flown into the case 100 through the inlet 110 provided in a lateral face of the case 100 and discharged into the outside of the room through the third flow passageway 3, the common inlet 311, the upper space, and the duct 200.

[0051] As described above, in the ventilating system of the invention, a single fan unit is used for supplying the outdoor air into the inside of a room or exhausting the indoor air into the outside of the room. In addition, according to the invention, a single duct is connected to the case thereof so as to alternately supply or exhaust the air. Therefore, the present invention can provide a small and less expensive ventilating system, as compared with the conventional ones. In addition, the noise and power consumption by the fan can be reduced, as compared with the convention ones having plural fans. Furthermore, the ventilating system of the invention has a heater and a filter. Thus, even in winter time, an air heated up to an appropriate temperature can be supplied, and a purified air can be supplied to the inside of the room, thereby providing pleasant indoor environments.

[0052] The forgoing embodiments are merely exemplary and are not to be construed as limiting the present invention. The present teachings can be readily applied to other types of apparatuses. The description of the present invention is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art.

Claims

1. A ventilating system comprising:

a case having an inlet and an outlet fluid-communicated with the inside of a room;
a first flow passageway fluid-communicating the case with the outside of the room;
a second flow passageway fluid-communicating the outlet with the first flow passageway, the second flow passageway being provided inside the case;
a third flow passageway fluid-communicating the inlet with the first flow passageway, the third flow passageway being provided inside the case;
a fan unit suctioning an indoor air through the third flow passageway and exhausting to the outside of the room through the first flow passageway, or suctioning an outdoor air through the first and second flow passageways and supplying into the inside of the room, the fan unit being provided inside the case; and
a first damper opening alternately the second flow passageway and the third flow passageway, the first damper being disposed between the outside of the room and the fan unit.

2. The system according to claim 1, wherein the fan unit suctions the air in an axial direction and discharges it in a radial direction.

3. The system according to claim 1, wherein the case is provided in a ceiling.

4. The system according to claim 1, wherein the second flow passageway and the third flow passageway are fluid-communicated with each other inside the case, and the fan unit is installed so as to suction the air through a point where the second and third flow passageways are fluid-communicatively connected to each other.

5. The system according to claim 1, wherein the fan unit comprises:

a scroll casing provided inside the case;
a fan provided inside the scroll casing;

a common inlet, through which the outdoor air flowing the second flow passageway or the indoor air flowing the third flow passageway is inflown, the common inlet being provided in the scroll casing;
a first outlet fluid-communicated with the outlet of the case and provided in the scroll casing; and
a second outlet fluid-communicated with the first flow passageway and provided in the scroll casing.

6. The system according to claim 5, wherein the fan suctions the air in-flown through the common inlet in an axial direction and thereafter discharges it in a radial direction towards the first outlet and the second outlet.

7. The system according to claim 5, wherein the common inlet is disposed so as to be fluid-communicated with the connection portion of the first flow passageway and the second flow passageway and the inlet of the case.

8. The system according to claim 1, further comprising a partition plate dividing the inner space of the case into two spaces, the partition plate being provided inside the case, wherein the fan unit is installed in such a manner that it is disposed in either one of the two spaces and suctions air inside the other space and discharges it into the either one of the two spaces.

9. The system according to claim 1, further comprising a second damper selectively opening and closing the inlet, the second damper being provided in the case.

10. The system according to claim 1, further comprising a third damper selectively opening and closing the outlet, the third damper being provided in the case.

11. The system according to claim 1, further comprising a fourth damper opening the inlet and the outlet alternately, the fourth damper being provided in the case.

12. The system according to claim 1, wherein the inlet is provided in a bottom face of the case and the outlet is provided in a side face of the case.

13. The system according to claim 1, wherein the inlet is provided in the lateral lower side of the case and the outlet is provided in the lateral upper side of the case.

14. The system according to claim 1, further comprising a heater heating the outdoor air being supplied into the inside of the room, the heater being provided in the first flow passageway.

15. The system according to claim 1, further comprising a filter purifying the outdoor air being supplied into the inside of the room, the filter being provided in the second flow passageway.

16. A ventilating system comprising:

a case having an inlet and an outlet fluid-communicated with the inside of a room;
a duct fluid-communicating the case with the outside of the room and guiding an outdoor air into the case or an indoor air inside the case into the outside of the room alternately;
a fan unit suctioning an air entered into the case and then exhausting toward the outlet and the duct, the fan unit being provided inside the case; and
a first damper blocking alternately the indoor air being discharged from the fan unit toward the duct and the outdoor air being supplied from the duct into the fan unit, the first damper being disposed between the duct and the fan unit.

17. The system according to claim 16, wherein the fan unit includes:

a common inlet fluid-communicated with the inlet of the case and the duct;
a fan suctioning an air through the common inlet and then discharging it;
a first outlet guiding the air, which is discharged from the fan, into the outlet of the case; and
a second outlet guiding the air, which is discharged from the fan, into the duct.

18. The system according to claim 16, further comprising a partition plate provided inside the case, wherein the partition plate divides the inner space of the case into two spaces, through one of which the air enters the unit fan and through the other one of which the air exits from the fan unit.

19. The system according to claim 18, wherein the first damper is assembled to the partition plate so as to close alternately the two spaces divided by the partition plate.

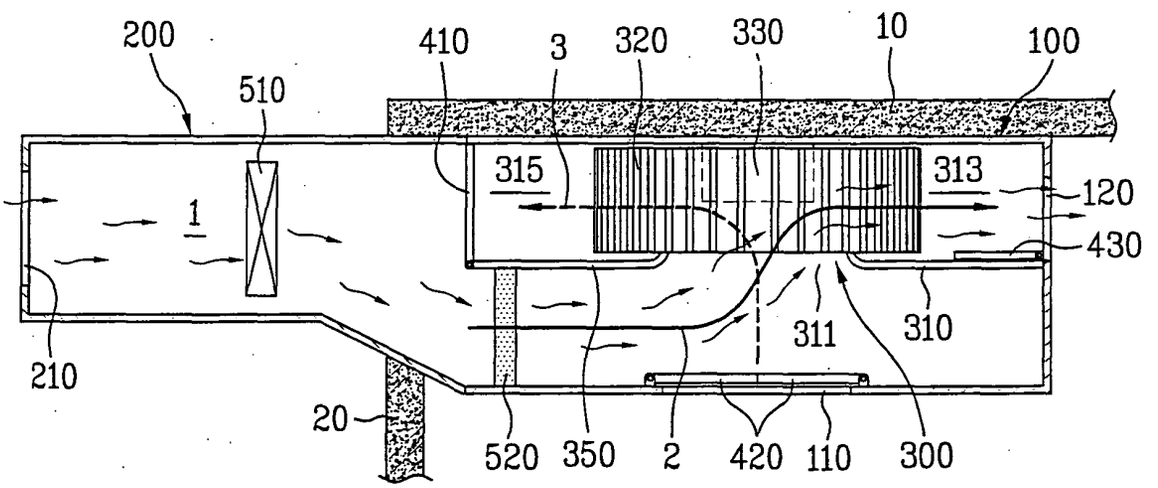
20. The system according to claim 16, further comprising at least one additional damper, which closes the inlet and the outlet of the case separately or alternately.

21. A ventilating system comprising:

a case including an inlet and an outlet fluid-

communicated with the inside of a room, a lower space fluid-communicated with the inlet, an upper space fluid-communicated with the outlet, and a common inlet fluid-communicating the upper space and the lower space;
a duct fluid-communicating the upper and lower spaces of the case with the outside of the room;
a fan suctioning an air of the lower space and discharging it towards the upper space, the fan being provided inside the case; and
a first damper fluid-communicating the duct alternately with the upper space or the lower space, the first damper being provided between the outside of the room and the fan.

FIG. 1


200
510
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3
320
330
10
100
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FIG. 2

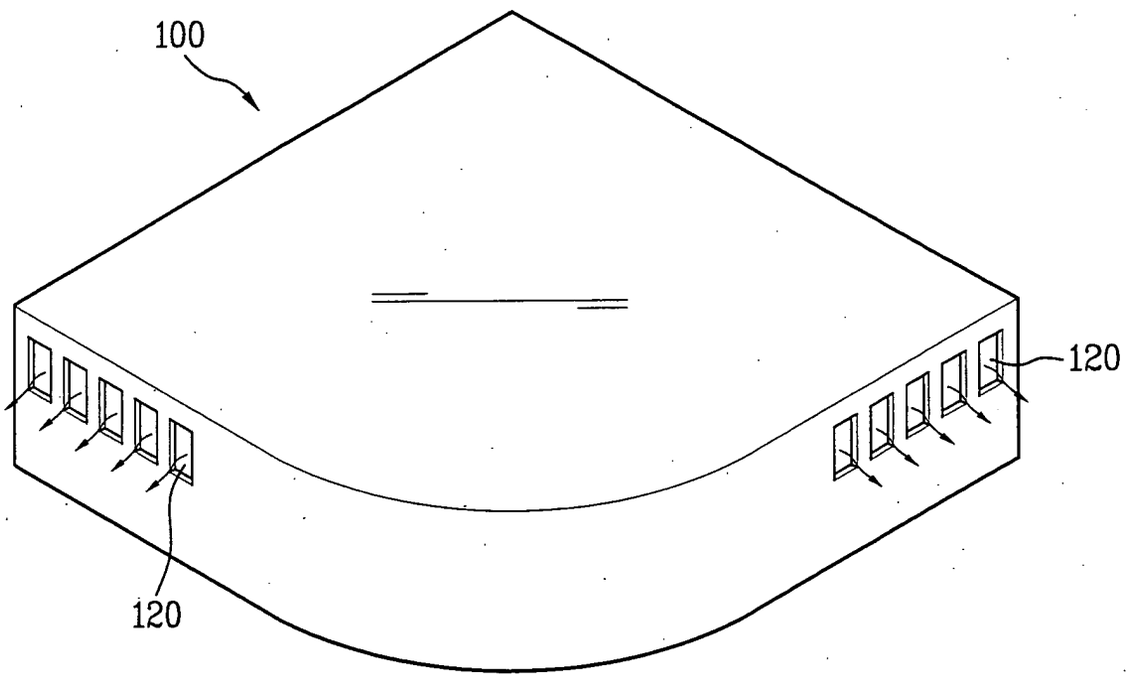

FIG. 3

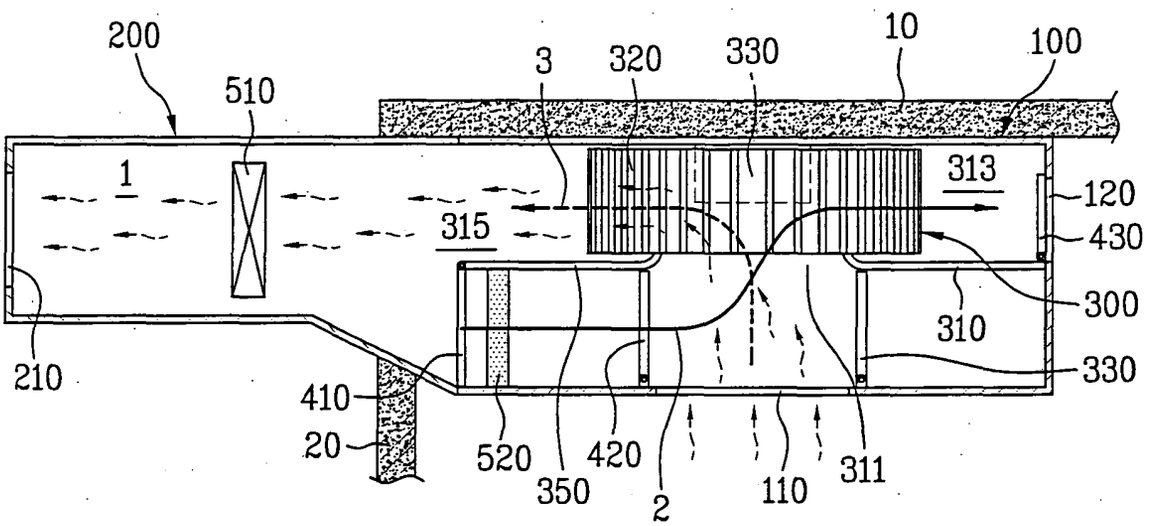
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FIG. 4

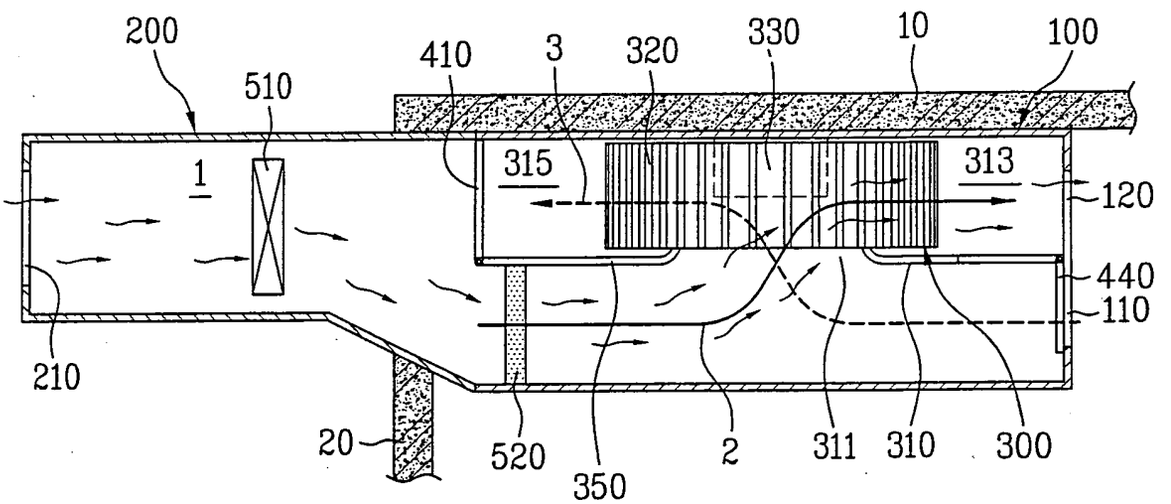
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FIG. 5

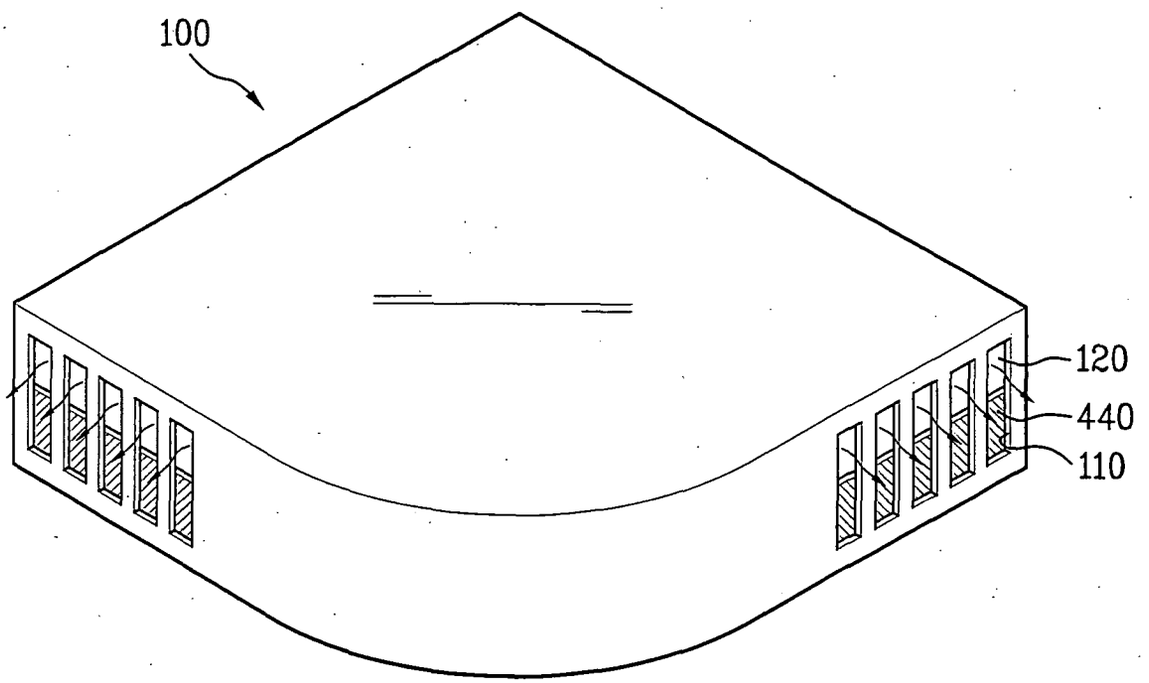

FIG. 6

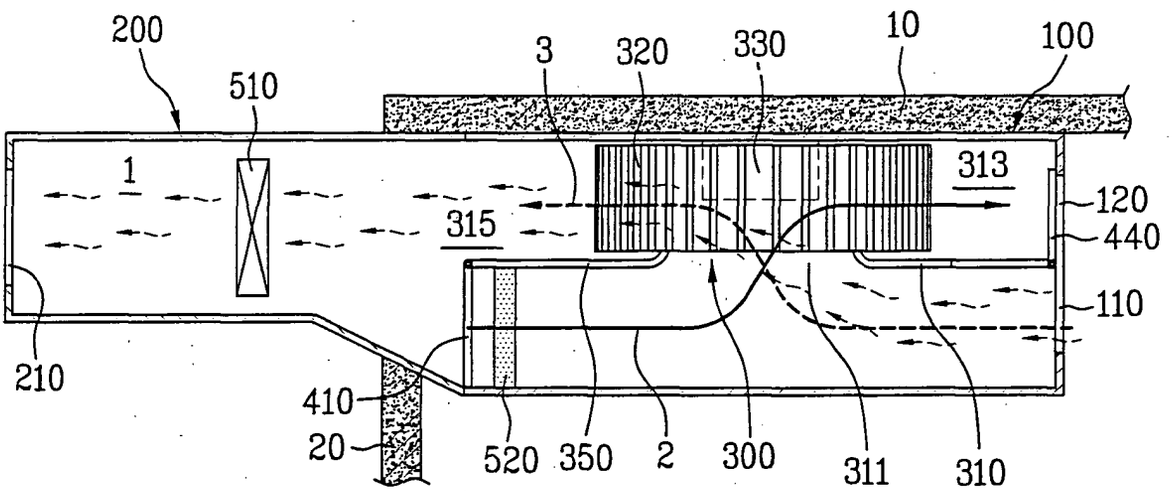
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FIG. 7