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(54) **VENTILATING SYSTEM**

(75) Inventor: **Jeong Yong Kim**, Seoul (KR)

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)

(73) Assignee: **LG Electronics Inc.**

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(57) **ABSTRACT**

Ventilating system including at least one regenerative duct assembly including a case having a discharge flow passage for passing room air, and a supply flow passage for passing outdoor air, formed therein, a crossflow type heat exchanger in the case, the crossflow type heat exchanger being provided to make the discharge flow passage, and the supply flow passage to cross each other, discharge ducts on an outdoor side and an indoor side of the case, the discharge ducts being in communication with the discharge flow passage, and supply ducts on the indoor side and the outdoor side of the case, the supply ducts being in communication with the supply flow passage; and fan assemblies in communication with the discharge flow passage and the supply flow passage respectively, thereby improving interchangeability and space utilization of the ventilating system.

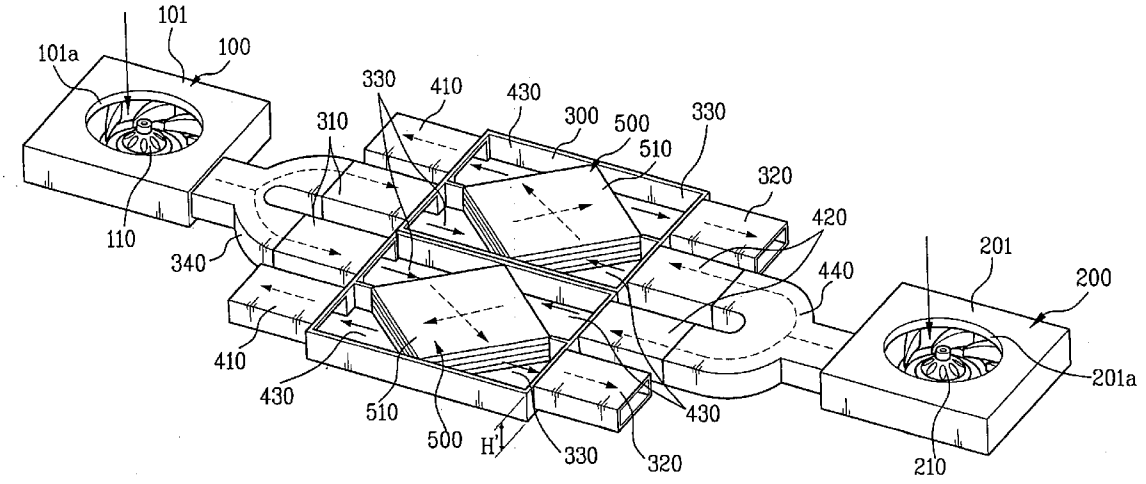


FIG. 1

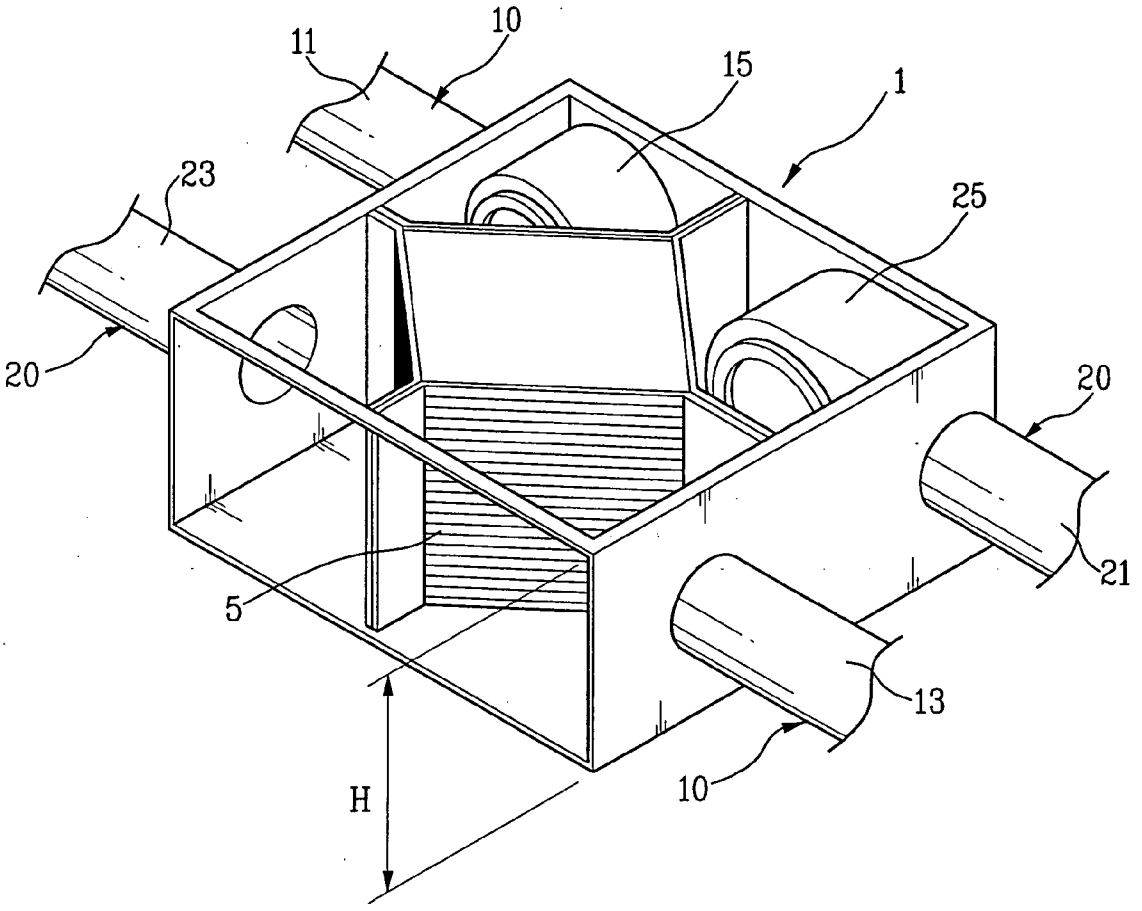


FIG. 2

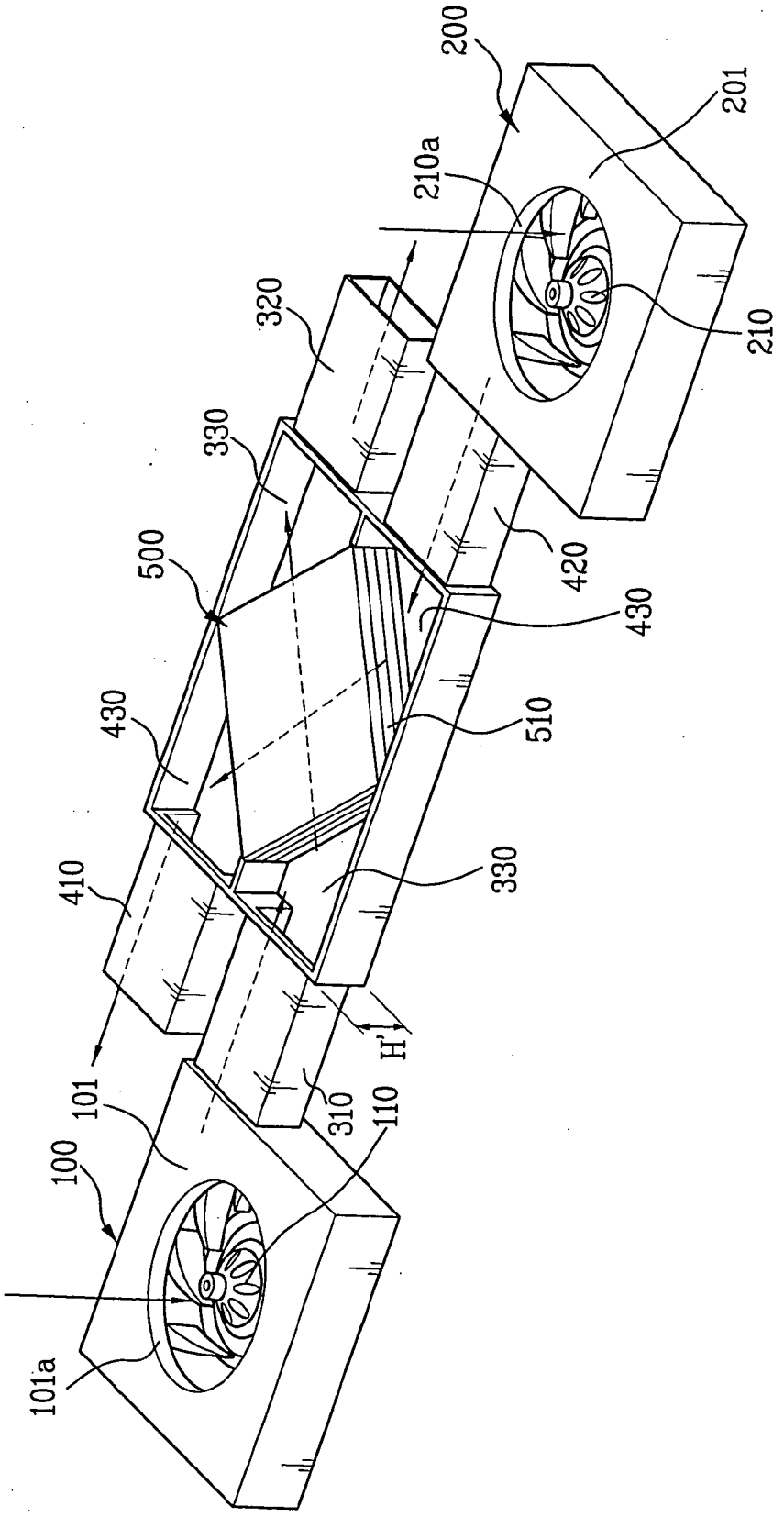

200
201
210a
210
320
330
500
420
430
430
510
330
410
H'
101
100
310
110
101a

FIG. 3

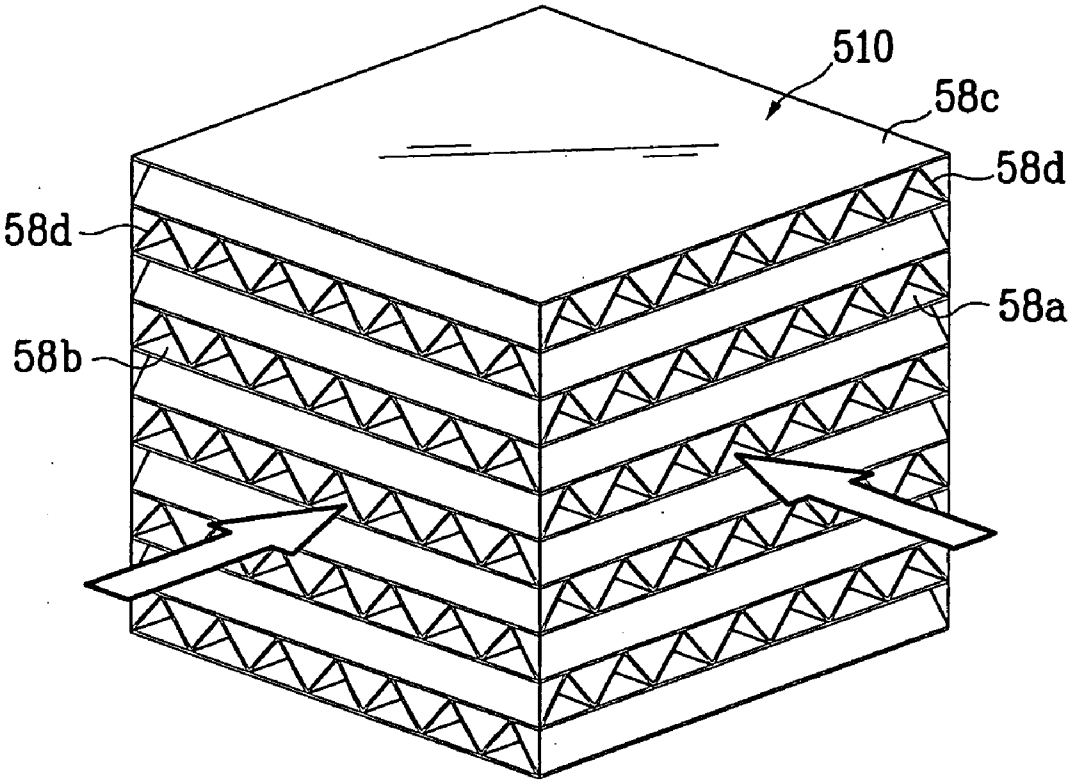


FIG. 4

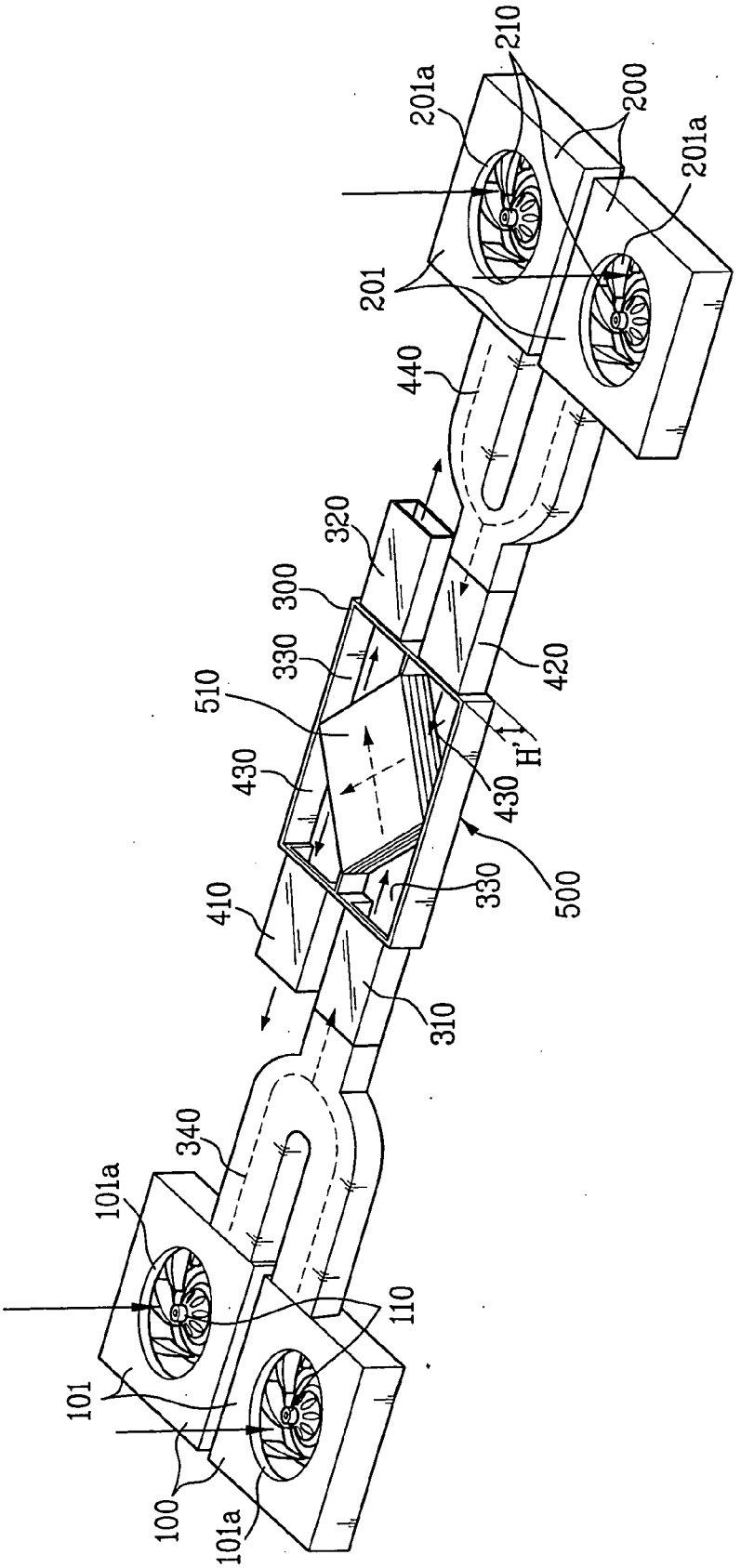
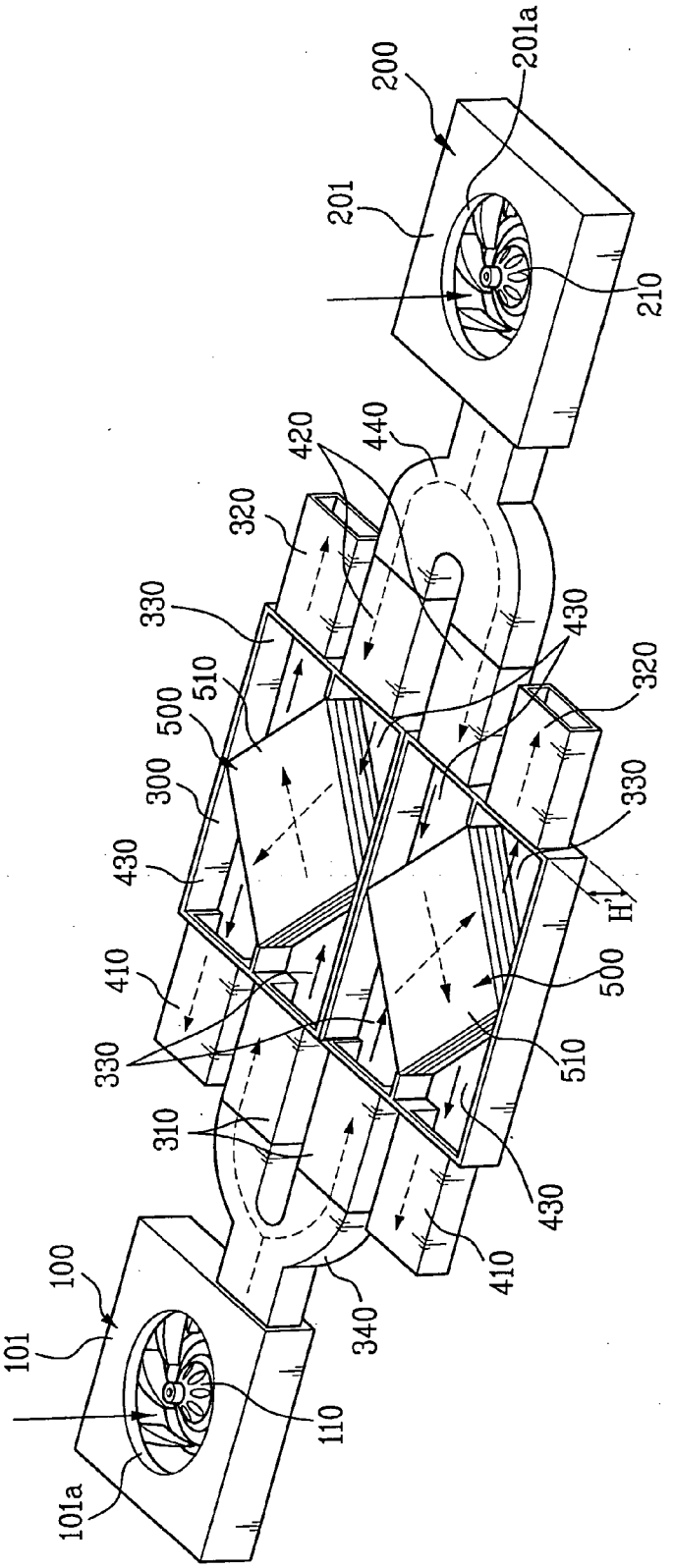

210
201a
200
201a
201
440
320
300
330
510
420
H'
430
430
500
330
410
310
340
101a
110
101
100
101a

FIG. 5


200
201a
201
210
420
440
320
330
430
510
500
300
320
330
H'
430
410
500
330
510
310
430
410
340
100
101
110
101a

VENTILATING SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Application No. P2004-36356 filed on May 21, 2004, which is hereby incorporated by reference as if fully set forth herein.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to ventilating systems, and more particularly, to a ventilating system of an improved structure.

[0004] 2. Discussion of the Related Art

[0005] In general, a carbon dioxide content in air of an enclosed space increases as time passes as organisms respire, and makes the organism difficult to breathe. Therefore, in a case many people stay in a small space, such as an office, or a car, it is required to replace room air with outdoor fresh air. To do this, the ventilating system is used.

[0006] A related art ventilating system uses one fan for forced discharge of room air to an outside of the room. If the room air has been cooled or heated by other air conditioner, the cold, or warm air is discharged from the room to an outside of the room, while outdoor air leaks through gaps between door or window, without heat exchange, wasting an energy required for cooling or heating the room.

[0007] Moreover, the leaking air changes a temperature of the room air suddenly to give unpleasant feeling to the people in the room. Furthermore, the failure in conditioning of humidity of the room air causes to fail in maintaining a comfortable room environment.

[0008] Particularly, because introduction of fresh air into the room is blocked while the room air is discharged to the outside of room in a state all the window and door to the room are closed, there is shortage of oxygen in the room.

SUMMARY OF THE INVENTION

[0009] Accordingly, the present invention is directed to a ventilating system that substantially obviates one or more problems due to limitations and disadvantages of the related art.

[0010] An object of the present invention is to provide a ventilating system which can reduce an energy loss for air conditioning.

[0011] Additional advantages, objects, and features of the invention will be set forth in part in the description which follows and in part will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention may be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[0012] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a ventilating system includes at least one regenerative duct assembly including a case having a discharge flow passage for passing room air, and a supply flow passage for passing outdoor air, formed therein, a crossflow type heat exchanger in the case, the crossflow type heat exchanger being provided to make the discharge flow passage, and the supply flow passage to cross each other, discharge ducts on an outdoor side and an indoor side of the case, the discharge ducts being in communication with the discharge flow passage, and supply ducts on the indoor side and the outdoor side of the case, the supply ducts being in communication with the supply flow passage; and fan assemblies in communication with the discharge flow passage and the supply flow passage, respectively.

[0013] The fan assembly includes a cabinet having an inlet in one side, and a fan in the cabinet for drawing the air through the inlet. It is preferable that the fan is a centrifugal fan for drawing the air in an axial direction and discharging the air in a radial direction.

[0014] The fan assemblies are provided to ends of the indoor side discharge duct and the outdoor side supply duct, respectively.

[0015] The crossflow type heat exchanger includes at least one first flow passage in communication with the supply flow passage, at least one second flow passage in communication with the discharge flow passage, the second flow passage being provided to cross the first flow passage, and flat plates separating the first flow passage and the second flow passage.

[0016] In the meantime, one pairs of fan assemblies are connected to the indoor side discharge duct, and the outdoor side supply duct in parallel, respectively. The ventilating system further includes a connection duct between the indoor side discharge duct and the fan assemblies, the connection duct having two inlets and one outlet, wherein the outlet is connected to the indoor side discharge duct, and the inlets are connected to the one pair of fan assemblies, respectively.

[0017] The ventilating system further includes a connection duct between the outdoor side discharge duct and the fan assemblies, the connection duct having two inlets and one outlet, wherein the outlet is connected to the outdoor side supply duct, and the inlets are connected to the fan assemblies, respectively.

[0018] Preferably, the indoor side supply duct and the outdoor side supply duct are mounted at opposite positions of the case in a diagonal direction, and the indoor side discharge duct and the outdoor side supply duct are mounted at positions crossed with the supply ducts.

[0019] The outdoor side supply duct has one end connected to the fan assembly, and the other end connected to one side of the case, and the indoor side supply duct has one end connected to the other side of the case, and the other end in communication with the room.

[0020] The outdoor discharge duct has one end in communication with an outdoor space, and the other end connected to one side of the case, and the indoor side discharge duct has one end connected to the other side of the case, and the other end connected to the fan assembly.

[0021] In the meantime, preferably one pair of the regenerative duct assemblies are provided in parallel to each other.

The outdoor side supply ducts of the regenerative duct assemblies are connected to each other with a connection duct having two outlets and one inlet.

[0022] The outlets are connected to the outdoor side supply ducts in parallel, and the inlet is connected to the fan assembly. The indoor side discharge ducts of the regenerative duct assemblies are connected with a connection duct having two outlets and one inlet. The outlets are connected to the indoor side discharge ducts in parallel respectively, and the inlet is connected to the fan assembly.

[0023] In another aspect of the present invention, a ventilating system includes a regenerative duct assembly including a case having a discharge flow passage for passing room air, and a supply flow passage for passing outdoor air, formed therein, a crossflow type heat exchanger in the case, the crossflow type heat exchanger being provided to make the flow passages to cross each other, discharge ducts on an outdoor side and an indoor side of the case, the discharge ducts being in communication with the discharge flow passage, and supply ducts on the indoor side and the outdoor side of the case, the supply ducts being in communication with the supply flow passage; and fan assemblies in communication with the outdoor side supply duct and the indoor side discharge duct respectively, the fan assemblies having fans in the cabinet for drawing air through the inlet.

[0024] It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] 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;

[0026] **FIG. 1** illustrates a perspective view of a ventilating system in accordance with a first preferred embodiment of the present invention;

[0027] **FIG. 2** illustrates a perspective view of a ventilating system in accordance with a second preferred embodiment of the present invention;

[0028] **FIG. 3** illustrates a perspective view of a crossflow type heat exchanger applicable to a ventilating system of the present invention;

[0029] **FIG. 4** illustrates a perspective view of a ventilating system in accordance with a third preferred embodiment of the present invention; and

[0030] **FIG. 5** illustrates a perspective view of a ventilating system in accordance with a fourth preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0031] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0032] A ventilating system in accordance with embodiments of the present invention will be described in detail, with reference to FIGS. **1** to **5** attached.

[0033] **FIG. 1** illustrates a perspective view of a ventilating system in accordance with a first preferred embodiment of the present invention.

[0034] Referring to **FIG. 1**, in a case **1**, there is a crossflow type heat exchanger **5**, having a discharge passage for passing room air, and a supply passage for passing outdoor air, formed to cross each other therein. In this instance, air passing through the passages of the heat exchanger **5** make heat exchange to each other. For an example, heat recovered from a high temperature air being discharged from the room is transferred to a low temperature air supplied to the room from an outside of room, to regenerate a thermal energy of the room.

[0035] On opposite sides of the box shaped case **1**, there are a supply portion **10** for guiding outdoor air into the room, and a discharge portion **20** for guiding room air to an outside of the room.

[0036] The supply portion **10** includes an outdoor side supply duct **11** on an outdoor side of the case **1**, and an indoor side supply duct **13** on an indoor side of the case **1**. The discharge portion **20** includes an outdoor side discharge duct **23** on an outdoor side of the case **1** and an indoor side discharge duct **21** on an indoor side of the case **1**. In conformity to the crossed supply passage and discharge passage in the case **1**, the supply ducts **11**, and **13**, and the discharge ducts **21**, and **23** are provided at crossed positions with reference to the case **1**.

[0037] In the meantime, there is a supply fan **15** at one end of the outdoor side supply duct **11** positioned in the case **1**, and there is a discharge fan **25** at one end of the indoor side supply duct **11**.

[0038] The heat regenerative ventilating system will be described.

[0039] When it is required to ventilate room air, power is applied to the discharge fan **25**, so that room air is discharged to an outside of room through the indoor side discharge duct **21**, the crossflow type heat exchanger **5**, and the outdoor side discharge duct **23**.

[0040] At the same time with this, a power is applied to the supply fan **15**, so that, after outdoor fresh air is introduced through the outdoor side supply duct **11**, the outdoor air is supplied to the room through the crossflow type heat exchanger **5** and the indoor side supply duct **13**. In this instance, the room air and the outdoor air passing through the crossflow type heat exchanger make heat exchange to each other.

[0041] In view of air flow configuration in the case **1**, the supply fan **15** and the discharge fan **25** are axial for drawing, and discharging air in an axial direction. According to this, heights of the heat exchangers **5** and the ducts **10**, and **20** become higher suitable to a height of the axial fan.

[0042] Moreover, the integrated ventilating system has a low versatility in application to various ventilating conditions. That is, in a case a flow passage resistance is changed

according to a length of the duct, it is required to replace the ventilating system itself for securing a desired ventilating rate.

[0043] A ventilating system in accordance with a second preferred embodiment of the present invention will be described, which solves the foregoing problems.

[0044] **FIG. 2** illustrates a perspective view of a ventilating system in accordance with a second preferred embodiment of the present invention.

[0045] Referring to **FIG. 2**, the ventilating system includes a regenerative duct assembly **500**, and at least one fan assembly **100**, and **200**. The regenerative duct assembly **500** includes a case **300**, a crossflow type heat exchanger **500**, discharge ducts **410**, and **420**, and supply ducts **310**, and **320**. Particularly, the regenerative duct assembly **500**, or the fan assemblies **100**, and **200** are modular devices, such that the devices can be replaced, or changed, selectively.

[0046] In side of the box shaped case **300**, there are a discharge flow passage **430** for passing room air, and a supply flow passage **330** for passing outdoor air. The crossflow type heat exchanger **510** is mounted on an inside of the case **300**, and has flow passages that make the discharge flow passage **430** and the supply flow passage **330** to cross.

[0047] **FIG. 3** illustrates a perspective view of a crossflow type heat exchanger applicable to a ventilating system of the present invention.

[0048] Referring to **FIG. 3**, the crossflow type heat exchanger **510** includes first flow passages **58***a*, second flow passages **58***b*, and flat plates **58***c* which separate the first flow passages **58***a* and the second flow passages **58***b*. The first flow passages **58***a* are provided to cross the first flow passages **58***a* such that the first flow passages **58***a* are in communication with the supply flow passage, and the second flow passages **58***b* are in communication with the discharge flow passage.

[0049] Moreover, in order to increase an area of heat exchange with air passing through the flow passages, bent plates **58***d* of metal bent in a zigzag shape are mounted on the flow passages respectively. According to this, a heat transfer rate is improved between the air passing through the flow passages, and the plates **58***c*, and **58***d*.

[0050] According to this, the outdoor air passing through the first flow passage **58** heat exchanges with the room air passing through the second flow passage **58***b*. Therefore, a portion of thermal energy can be recovered from the room air being discharged to an outside of the room, and regenerated, again.

[0051] Moreover, because the outdoor air being supplied to the room is introduced into the room after the outdoor air is air conditioned by means of heat exchange with the room air being discharged to an outside of the room, sudden change of a room environment can be protected.

[0052] In the meantime, referring to **FIG. 2**, the discharge ducts **410**, and **420** are connected to the case **300** so that the discharge ducts **410**, and **420** are in communication with the discharge flow passage **430**, and divided into an outdoor side discharge duct **410** and an indoor side discharge duct **420** with reference to the case **300**. The supply ducts **310**, and **320** are connected to the case **300** so that the supply ducts **310**, and **320** are in communication with the supply flow passage **330**, and divided into an outdoor side supply duct **310** and an indoor side supply duct **320** of the case **300**.

[0053] The fresh outdoor air is supplied to the room through the indoor side supply duct **320** after being introduced into the case **300** and the heat exchanger **510** through the outdoor side supply duct **310**. Contaminated room air is discharged to an outside of the room through the outdoor side supply duct **310** after being introduced into the case **300** and the heat exchanger **510** through the indoor side discharge duct **420**.

[0054] In the meantime, for making the room air and the outdoor air to move, the fan assemblies **100**, and **200** are mounted so as to be in communication with the discharge flow passage **430** and the supply flow passage **330**. In more detail, an indoor fan assembly **200** is mounted at one end of the indoor side discharge duct **420**, and an outdoor fan assembly **100** is mounted at one end of the outdoor side supply duct **310**.

[0055] The fan assemblies **100**, and **200** include cabinets **101**, and **201**, and fans **110**, and **210**, respectively. The cabinets **101**, and **201**, exteriors of the fan assemblies **100**, and **200**, each has a circular inlet **101***a*, or **201***a* in one side of an upper surface for drawing air, and a connection opening (not shown) in one side in communication with the duct.

[0056] In the cabinet **101**, or **201**, there is a fan **110**, or **210** for drawing air through the inlet **101***a*, or **201***a*. Preferably, the fan **110**, or **210** is of a centrifugal type which draws air in an axial direction, and discharges the air in a radial direction. That is, as the fan **110**, or **210** rotates, air is introduced therein through the inlet **101***a*, or **201***a*, and directed toward the duct through the connection opening.

[0057] Since the centrifugal fan can be designed to have a height H' lower than an axial flow fan by about ½, a height H' of the ventilating system can be designed low in overall, enabling to install the ventilating system even in a comparatively small space of a ceiling.

[0058] In the meantime, connection structures of the ducts will be described in detail, with reference to **FIG. 2**.

[0059] As shown, it is preferable that the indoor side supply duct **320** and the outdoor side supply duct **310** are mounted at opposite positions of the case **300** in a diagonal direction. It is also preferable that the indoor side discharge duct **420** and the outdoor side supply duct **410** are mounted at positions crossed with the supply ducts **320**, and **310**.

[0060] The outdoor side supply duct **310** has one end connected to the outdoor fan assembly **100**, and the other end connected to one side of the case **300**, and the indoor side supply duct **320** has one end connected to the other side of the case **300**, and the other end in communication with the room.

[0061] The outdoor side discharge duct **410** has one end in communication with an outdoor space, and the other end connected to one side of the case **300**, and the indoor side discharge duct **420** has one end connected to the other end of the case **300**, and the other end connected to the indoor fan assembly **200**.

[0062] According to this, the outdoor air drawn by the outdoor fan assembly **100** is introduced to the case **300** and

the heat exchanger **510** through the outdoor side supply duct **310**. Opposite to this, the room air drawn by the indoor fan assembly **200** is introduced to the case **300** and the heat exchanger **510** through the indoor side discharge duct **420**.

[**0063**] The room air and the outdoor air make heat exchange with each other as the room air and the outdoor air cross each other along the flow passages in the crossflow type heat exchanger **510**. Then, the room air is discharged to an outside of the room through the outdoor side discharge duct **410**, and the outdoor air is supplied to the room through the indoor side supply duct **310**.

[**0064**] In to the second embodiment of the present invention, the modular regenerative duct assembly **500** is interchangeable according to an environmental condition. If there are great pressure losses caused by flow passage resistance coming from long supply duct and the discharge duct, the ventilating system may be changed as follows.

[**0065**] **FIG. 4** illustrates a perspective view of a ventilating system in accordance with a third preferred embodiment of the present invention.

[**0066**] Referring to **FIG. 4**, each of the indoor side discharge duct **430** and the outdoor side supply duct **310** has one pair of fan assemblies **100**, or **200** connected thereto in parallel. For connection to the one pair of fan assemblies **100**, or **200**, a connection duct **340**, or **440** is employed, which has two inlets and one outlet.

[**0067**] That is, the indoor side discharge duct **420** and the one pair of the indoor fan assemblies **200** are connected with the inside connection duct **440**. The outlet of the connection duct **440** is connected to the indoor side discharge duct **420**, and the inlets thereof are connected to the one pair of the fan assemblies **200**, respectively.

[**0068**] Also, the outdoor side supply duct **310** and the one pair of the outdoor fan assemblies **100** are connected with the outside connection duct **340**. In this instance, the outlet of the connection duct **340** is connected to the outdoor side supply duct **310**, and the inlets thereof are connected to the one pair of fan assemblies **100**, respectively.

[**0069**] As air is drawn, and blown by the one pair of fan assemblies **100**, and **200**, the room air and the outdoor air can be moved through the discharge flow passage **430** and the supply flow passage **300**, well.

[**0070**] Even though a case is taken as an example, in which one pair of fan assemblies are connected in parallel with one duct, the present invention is not limited to this, but more than two fan assemblies may be connected with on duct in parallel.

[**0071**] In the meantime, in a case there is a great temperature difference between room air and outdoor air, to require a higher rate of heat exchange, a ventilating system of the following embodiment may be used.

[**0072**] **FIG. 5** illustrates a perspective view of a ventilating system in accordance with a fourth preferred embodiment of the present invention.

[**0073**] Referring to **FIG. 5**, one pair of the regenerative duct assemblies **500** are installed in parallel, for split flow of the room air and the outdoor air into the two regenerative duct assemblies **500**, to increase an overall heat transfer area.

[**0074**] In a case the one pair of regenerative duct assemblies **500** are arranged in parallel, the outside connection duct **340** and the inside connection duct **440** are connected to ends of two adjacent outdoor side supply duct **310** and ends of two adjacent discharge duct **420**, respectively.

[**0075**] Each of the connection ducts **340**, and **440** has two outlets and one inlet. Therefore, the adjacent outdoor side supply ducts **310** are connected to the outlets of the outside connection duct **340** in parallel respectively, and the inlet is connected to the outdoor fan assembly **100**. Also, the one pair of adjacent indoor side discharge ducts **420** are connected to the outlets of the inside connection duct **440** in parallel respectively, and the inlet is connected to the indoor fan assembly **200**.

[**0076**] A plurality of fan assemblies may be connected to the inlets of the connection ducts, for stronger blowing of the air.

[**0077**] The ventilating system in accordance with a fourth embodiment of the present invention will be described.

[**0078**] Upon supplying power to the indoor fan assembly **200**, room air drawn as the fan **210** rotates is split at the inside connection duct **440**, passes the indoor side discharge ducts **420**, the one pair of cases **300**, and the crossflow type heat exchangers **510**. Then, the air is discharged to the room through the outdoor side discharge ducts **410**.

[**0079**] At the same time with this, when power is supplied to the outdoor fan assembly **100**, the outdoor air drawn as the fan **110** rotates is split at the outside connection duct **340**, passes the outdoor side supply ducts **310**, one pair of cases **300**, and the crossflow type heat exchangers **510**. Then, the air is supplied to an inside of the room through the indoor side supply ducts **320**.

[**0080**] Thus, because the room air and the outdoor air split, and pass the one pair of crossflow type heat exchanger **510**, a heat transfer area increases. According to this, a heat transfer rate between the room air and the outdoor air can be improved. Moreover, if it is desired to enhance the heat exchanger rate further, a plurality of the regenerative duct assemblies **500** and the fan assemblies **100**, and **200** may be arranged in parallel. According to this, the outdoor air can be supplied to the room after the outdoor air heat exchanges with the room air to a more suitable temperature.

[**0081**] As has been described, the ventilating system of the present invention has the following advantages.

[**0082**] First, the fan assembly of a centrifugal type for blowing the room air and the outdoor air permits to reduce a height of the ventilating system, enabling to install the ventilating system in a small space, like a ceiling.

[**0083**] Second, the modularized regenerative duct assembly and the fan assembly of the ventilating system permits various combination of the assemblies according to a ventilating condition.

[**0084**] Third, the fan assembly provided separate from the regenerative duct assembly permits to deal with a ventilating condition more actively by providing more fan assembly additionally in a case an increase of air supply rate is required.

[**0085**] It will be apparent to those skilled in the art that various modifications and variations can be made in the

present invention without departing from the spirit or scope of the inventions. Thus, it is intended that the present invention covers the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A ventilating system comprising:

at least one regenerative duct assembly including;

a case having a discharge flow passage for passing room air, and a supply flow passage for passing outdoor air, formed therein,

a crossflow type heat exchanger in the case, the crossflow type heat exchanger being provided to make the discharge flow passage, and the supply flow passage to cross each other,

discharge ducts on an outdoor side and an indoor side of the case, the discharge ducts being in communication with the discharge flow passage, and

supply ducts on the indoor side and the outdoor side of the case, the supply ducts being in communication with the supply flow passage; and

fan assemblies in communication with the discharge flow passage and the supply flow passage, respectively.

2. The ventilating system as claimed in claim 1, wherein the fan assembly includes;

a cabinet having an inlet in one side, and

a fan in the cabinet for drawing the air through the inlet.

3. The ventilating system as claimed in claim 2, wherein the fan is a centrifugal fan for drawing the air in an axial direction and discharging the air in a radial direction.

4. The ventilating system as claimed in claim 1, wherein the fan assemblies are provided to ends of the indoor side discharge duct and the outdoor side supply duct, respectively.

5. The ventilating system as claimed in claim 1, wherein the crossflow type heat exchanger includes;

at least one first flow passage in communication with the supply flow passage,

at least one second flow passage in communication with the discharge flow passage, the second flow passage being provided to cross the first flow passage; and

flat plates separating the first flow passage and the second flow passage.

6. The ventilating system as claimed in claim 1, wherein one pairs of fan assemblies are connected to the indoor side discharge duct, and the outdoor side supply duct in parallel, respectively.

7. The ventilating system as claimed in claim 6, further comprising a connection duct between the indoor side discharge duct and the fan assemblies, the connection duct having two inlets and one outlet, wherein the outlet is connected to the indoor side discharge duct, and the inlets are connected to the one pair of fan assemblies, respectively.

8. The ventilating system as claimed in claim 6, further comprising a connection duct between the outdoor side discharge duct and the fan assemblies, the connection duct having two inlets and one outlet, wherein the outlet is connected to the outdoor side supply duct, and the inlets are connected to the fan assemblies, respectively.

9. The ventilating system as claimed in claim 1, wherein the indoor side supply duct and the outdoor side supply duct are mounted at opposite positions of the case in a diagonal direction, and the indoor side discharge duct and the outdoor side supply duct are mounted at positions crossed with the supply ducts.

10. The ventilating system as claimed in claim 9, wherein the outdoor side supply duct has one end connected to the fan assembly, and the other end connected to one side of the case, and

the indoor side supply duct has one end connected to the other side of the case, and the other end in communication with the room.

11. The ventilating system as claimed in claim 9, wherein the outdoor discharge duct has one end in communication with an outdoor space, and the other end connected to one side of the case, and

the indoor side discharge duct has one end connected to the other side of the case, and the other end connected to the fan assembly.

12. The ventilating system as claimed in claim 1, wherein one pair of the regenerative duct assemblies are provided in parallel to each other.

13. The ventilating system as claimed in claim 12, wherein the outdoor side supply ducts of the regenerative duct assemblies are connected to each other with a connection duct having two outlets and one inlet.

14. The ventilating system as claimed in claim 13, wherein the outlets are connected to the outdoor side supply ducts in parallel, and the inlet is connected to the fan assembly.

15. The ventilating system as claimed in claim 12, wherein the indoor side discharge ducts of the regenerative duct assemblies are connected with a connection duct having two outlets and one inlet.

16. The ventilating system as claimed in claim 15, wherein the outlets are connected to the indoor side discharge ducts in parallel respectively, and the inlet is connected to the fan assembly.

17. A ventilating system comprising:

a regenerative duct assembly including;

a case having a discharge flow passage for passing room air, and a supply flow passage for passing outdoor air, formed therein,

a crossflow type heat exchanger in the case, the crossflow type heat exchanger being provided to make the flow passages to cross each other,

discharge ducts on an outdoor side and an indoor side of the case, the discharge ducts being in communication with the discharge flow passage, and

supply ducts on the indoor side and the outdoor side of the case, the supply ducts being in communication with the supply flow passage; and

fan assemblies in communication with the outdoor side supply duct and the indoor side discharge duct respectively, the fan assemblies having fans in the cabinet for drawing air through the inlet.

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