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(54) **Air conditioner**

(57) The present invention provides an air conditioner including a case, a compressor provided in the case, an evaporator, a condenser, an air duct system for heat ventilation or air refrigeration selectively, and piping members used thereof. The said compressor is positioned at the bottom of the case, and the said evaporator and condenser are mounted above the compressor side by side. The said air duct system is provided in the top of the case. On each side of the said case there are cooled air outlet for evaporator and heated air outlet for condenser. The air conditioner is convenient to use and a 4-way solenoid valve and repeated piping members, regularly used for transition between heating and cooling, are left out. The air conditioner provided by this invention is in a structure type of single refrigeration, but has function of cooling and heating.

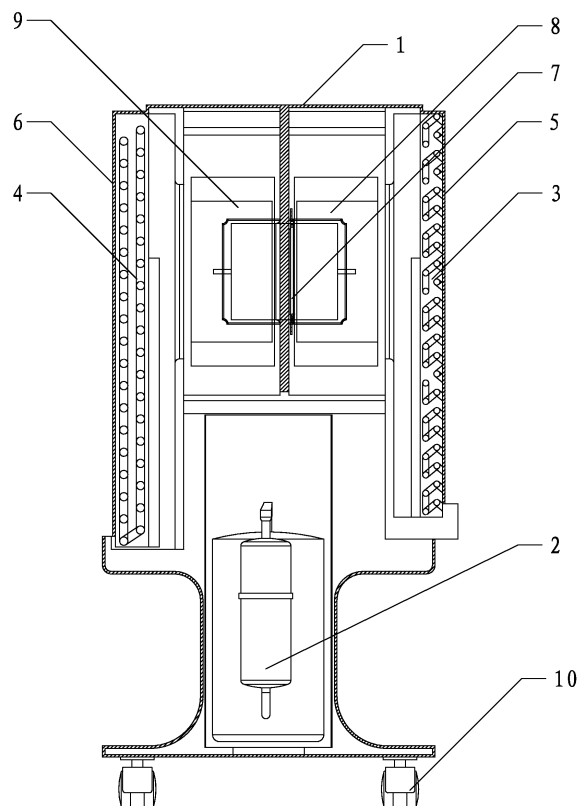


Fig. 1

Description

Field of invention

[0001] The present invention relates to an air conditioner, specifically to a heating, ventilation and air conditioning (HVAC) equipment.

Background

[0002] Air conditioner is a kind of equipment which can make the room air at a comfortable condition. According to the prior art, a kind of HVAC can be used to blow cooled air into the room and discharge heat to external environment to cool the room in summertime, while discharge heat to the room and blow the cold air into the external environment for heating the room air in wintertime. This kind of HVAC primarily comprises a case, a compressor provided in the case, an evaporator, a condenser, air duct systems for heat ventilation and air refrigeration, and two sets of exchange systems, with piping members etc. Comparing with the refrigeration air conditioner, it is not only larger and more complicated in structure, but also inconvenient to use when its mode is switched between cooling and heating.

Summary of the invention

[0003] Accordingly, to overcome the disadvantages of the related art, the present invention is to provide a heating and air conditioning equipment which is simpler in structure and easier to use.

[0004] In accordance with the purpose of the present invention, as embodied and broadly described herein, the air conditioner includes a case, a compressor provided in the case, an evaporator, a condenser, an air duct system for heat ventilation or air refrigeration selectively, and piping members used thereof. The said compressor is positioned at the bottom of the case, and the said evaporator and condenser are mounted above the compressor side by side. The said air duct system is provided in the top of the case. On each side of the said case there are cooled air outlet for evaporator and heated air outlet for condenser.

[0005] The present invention has advantages of setting the cooled air outlet towards the inside room to let heated air be extracted out to the external environment in the cooling estate and setting the heated air outlet towards the inside room to let cooled air be extracted out to the external environment in the heating estate, by rotating the case for a 180-degree angle, for the evaporator and condenser are mounted abreast, and on two opposite sides of the said case there are cooled air outlet and heated air outlet respectively, to make it be convenient to use.

[0006] The present invention also get rid of a regular four-way valve for heat exchange and redundant piping member, and have the compressor positioned at the bot-

tom of the case to make its structure simpler.

Brief description of the drawings

[0007] A further understanding of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

FIG. 1 is a section view of an air conditioner according to the present invention;

FIG. 2 is a view showing the air conditioner in the cooling mode; and

FIG. 3 is a view showing the air conditioner in the heating mode.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0008] As shown in Fig. 1 to 3, an air conditioner according to a preferred embodiment of the present invention includes a case 1, a compressor 2 located in the case 1, an evaporator 3, a condenser 4, an air duct system for heat ventilation or air conditioning selectively, and piping members, wherein the said compressor 2 is positioned at the bottom of the case 1, and the said evaporator 3 and condenser 4 are mounted above the compressor 2 side by side, with air duct system for heated air and cooled air is provided at the top of the case 1, on each side of the said case 1 there are cooled air outlet 5 corresponding to the evaporator 3 and heated air outlet 6 corresponding to condenser 4. Above the said compressor 2 is mounted a bidirectional motor 7, which has an air-cooled impeller 8 and a radiating impeller 9 above.

[0009] When the air conditioner is operated in a cooling mode, a vent-pipe 11 is inter-connected with heated air outlet 6, and rotate the said case 1 in a certain degree to make the cooled air outlet 5 face to the inside room. As the room temperature is high, hot room air is introduced by the air-cooled impeller 8 to the surface of the evaporator 3, and then the refrigerant in evaporator 3 absorbs heat of the air to cool it, causing the vapor in the air cooled to be condensed into liquid which is then discharged out of the room, and the refrigerant vaporized into steam with lower temperature and pressure after absorbing heat. After cooled by the evaporator 3, the air meeting the requirements is blown into room through the cooled air outlet 5, resulting in temperature drop in the room. In the meantime, lower-temperature-and -pressure refrigerant steam is introduced into compressor 2, to be compressed into higher-temperature-and-pressure steam which is then guided into condenser 4, and then in the action of the radiating impeller 9, the air becomes hotter after absorbing heat from the surface of the condenser 4 and is discharged into external environment through the vent-pipe 11. The refrigerant passes by throttle valve and is turned into lower-temperature liquid, for cooling the room air again which flows through the evap-

orator 3. The air conditioner repeats the foregoing processes to cool the room circularly.

[0010] In heating operation, the vent-pipe 11 is interconnected with cooled air outlet 5, while the said case 1 makes a 180-degree turn with the heated air outlet 6 faces to the inside room. As the temperature in the room is low, the cold air flows through the surface of condenser 4 with the help of radiating impeller 9 to absorb heat, then be discharged into room through heated air outlet 6, while the cold air from the room is discharged into external environment through the vent-pipe 11, resulting in heating the room air, by condensing and discharging heat.

[0011] Compared with the air conditioner to the prior art, the air conditioner according to the present invention is convenient to use and has reduced a 4-way solenoid valve and repeated piping members, regularly used for transition between heating and cooling. The air conditioner provided by this invention is in a structure type of single refrigeration, but has function of cooling and heating; and for the bidirectional motor 7 is utilized, a motor and start-up capacitance using thereof according to the prior art can be left out, for the convenience to assemble and maintain, and for saving space.

[0012] Additionally, the bottom of the case 1 is concave, so while packaging the air conditioner, the vent-pipe 11 can be deposited in the concave surface of case 1 for saving the package space.

[0013] Preferably, a universal wheel is provided on bottom side of the case, so while moving or turning the air conditioner, just a little force is needed to carry out the operation.

[0014] Some technical parts which have not been described in details have been acknowledged by technicians of the related field prior to this invention.

the said compressor.

3. The air conditioner according to claim 1, wherein the said case has a universal wheel provided on bottom side.

Claims

1. An air conditioner comprising,
 - A case;
 - A compressor provided in the case;
 - An evaporator;
 - A condenser;
 - An air duct system for heat ventilation or air refrigeration respectively; and
 - Piping members using thereof; is **characterized in that,**
 - The said compressor is positioned at the bottom of the case, with the air duct system situated at the top of the case, and the said evaporator and condenser are mounted above the compressor side by side, respectively corresponding to cooled air outlet and heated air outlet located on the two opposite sides of the said case.
2. The air conditioner according to claim 1, wherein a bidirectional motor which has an air-cooled impeller and a radiating impeller thereon, is mounted above

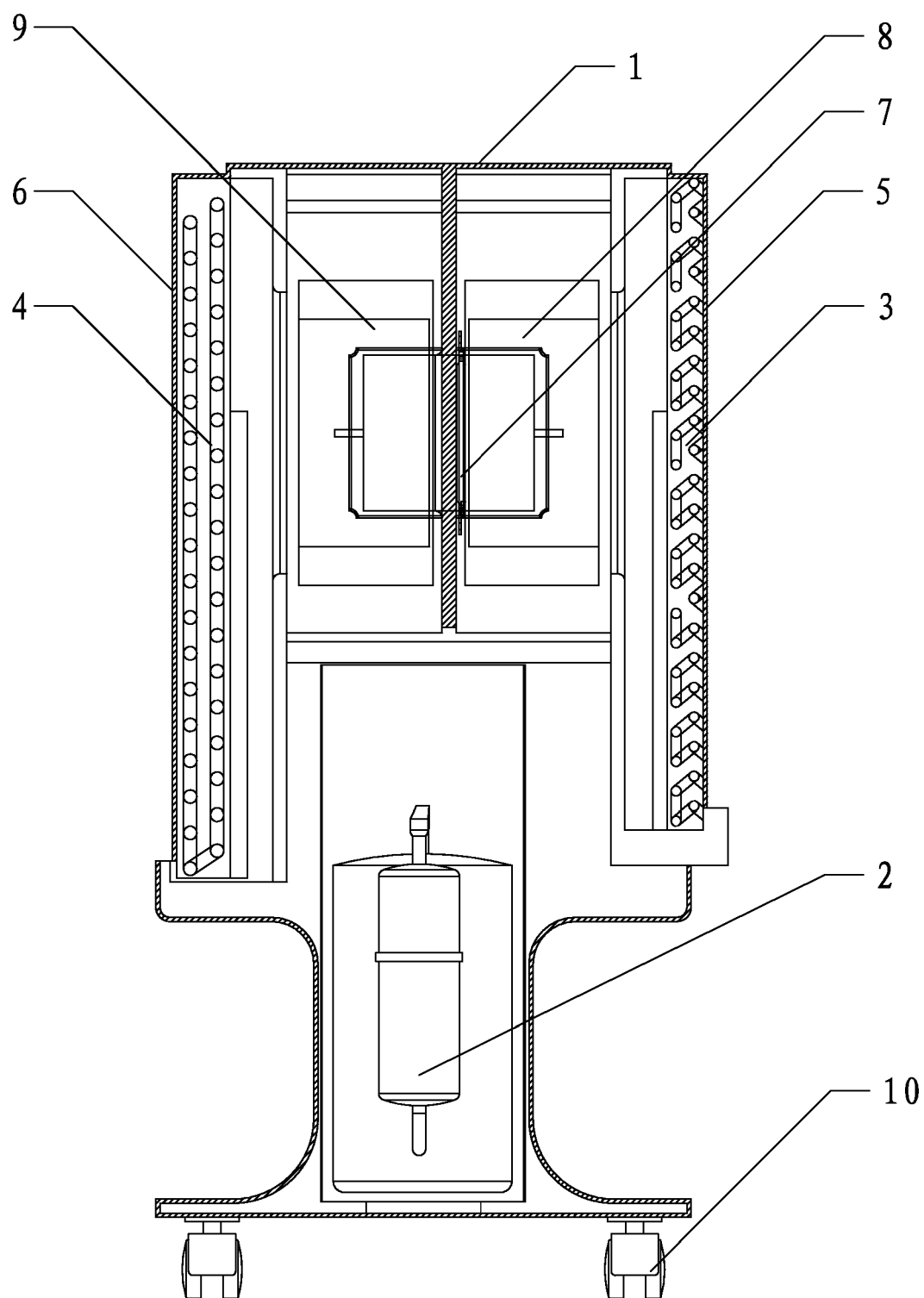


Fig. 1

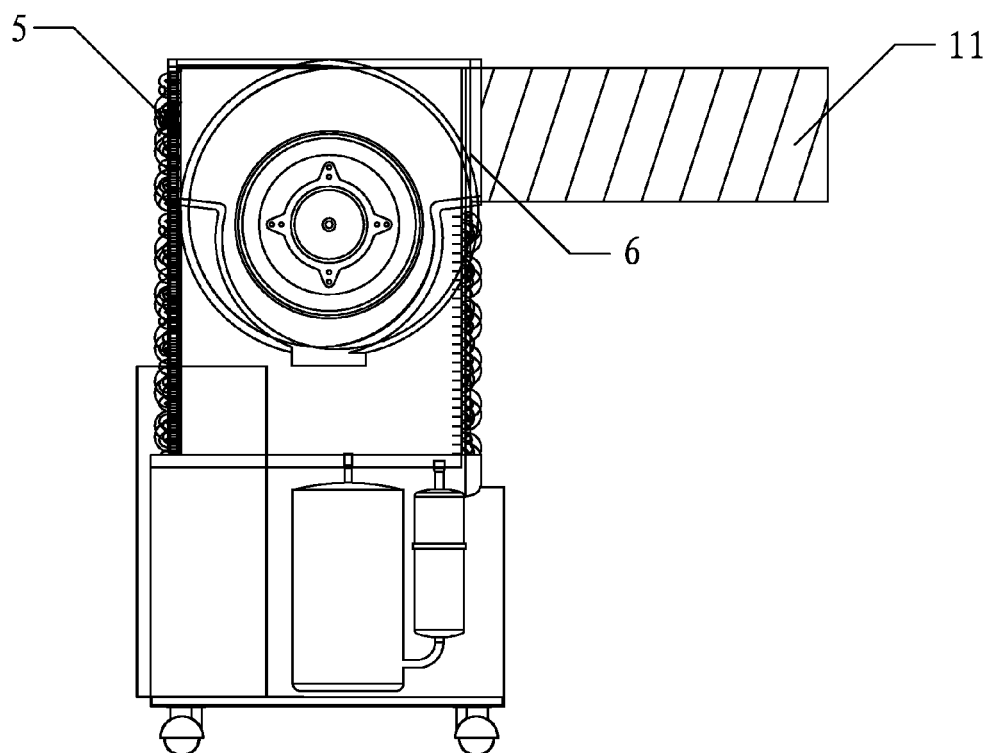


Fig. 2

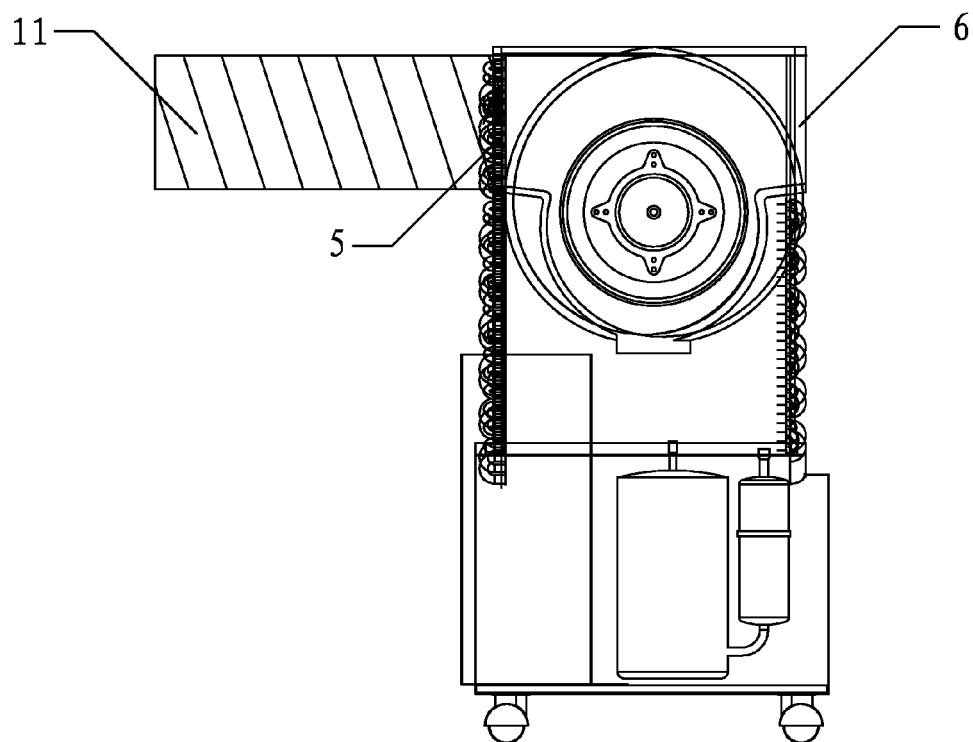


Fig. 3