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(54) **CLOTHES DRYER**

(57) The present disclosure discloses a clothes dryer (100) including: a machine body (10); a drum body (20), disposed in the machine body (10) and defining a containing chamber (21) therein; an air passage (30) disposed in the machine body (10) and having an air outlet (32) in communication with the containing chamber (21); and a heat pump system including: a compressor (41), disposed in the machine body (10), located outside of the air passage (30), and having a compressor inlet (411) and a compressor outlet (412); a first heat exchanger (42), disposed in the air passage (30) and communicating with the compressor inlet (411); and a second heat exchanger (43), disposed in the air passage (30) and communicating with the compressor outlet (412) and the first heat exchanger (42), in which hot air generated by the first heat exchanger (42) and the second heat exchanger (43) is transported to the containing chamber (21) through the air outlet (32) of the air passage (30), and the air passage (30) is provided with at least one through hole (51, 52) in communication with a mounting chamber (80) of the compressor (41); so as to make heat in the mounting chamber (80) enter the air passage (30) to accelerate a temperature rising speed of air in the air passage (30), thus raising a utilization efficiency of the heat of the clothes dryer (100) and a drying efficiency of the clothes dryer (100).

communicating with the compressor outlet (412) and the first heat exchanger (42), in which hot air generated by the first heat exchanger (42) and the second heat exchanger (43) is transported to the containing chamber (21) through the air outlet (32) of the air passage (30), and the air passage (30) is provided with at least one through hole (51, 52) in communication with a mounting chamber (80) of the compressor (41); so as to make heat in the mounting chamber (80) enter the air passage (30) to accelerate a temperature rising speed of air in the air passage (30), thus raising a utilization efficiency of the heat of the clothes dryer (100) and a drying efficiency of the clothes dryer (100).

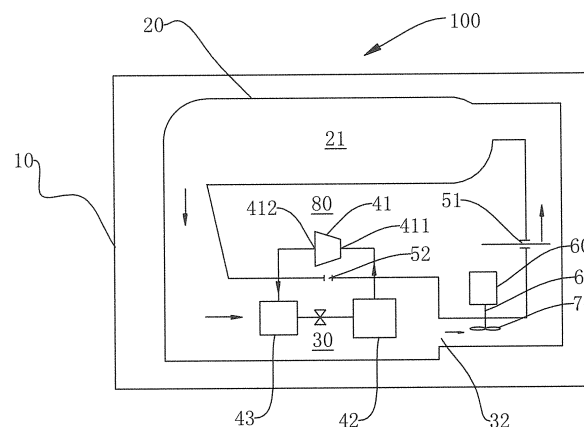


Fig. 1

Description

FIELD

[0001] The present disclosure relates to a technical field of household electrical appliances, and particularly to a clothes dryer.

BACKGROUND

[0002] A current drum-type clothes dryer usually adopts a heat pump system to dry clothes. The heat pump system is usually composed of a compressor, a condenser and an evaporator. Usually, heated air is used to dry the clothes after air is heated only by the condenser. However, the condenser has a limited heating effect on air, so a clothes drying efficiency is low.

SUMMARY

[0003] The present disclosure seeks to solve at least one of the above problems to at least some extent.

[0004] Therefore, the present disclosure provides a clothes dryer that is simple in structure and high in drying efficiency.

[0005] The clothes dryer according to an embodiment of the present disclosure includes a machine body; a drum body, disposed in the machine body and defining a containing chamber therein; an air passage disposed in the machine body and having an air outlet in communication with the containing chamber; and a heat pump system including: a compressor, disposed in the machine body, located outside of the air passage, and having a compressor inlet and a compressor outlet; a first heat exchanger, disposed in the air passage and communicating with the compressor inlet; and a second heat exchanger, disposed in the air passage and communicating with the compressor outlet and the first heat exchanger, in which hot air generated by the first heat exchanger and the second heat exchanger is transported to the containing chamber through the air outlet of the air passage, and the air passage is provided with at least one through hole in communication with a mounting chamber of the compressor.

[0006] With the clothes dryer according to an embodiment of the present disclosure, the at least one through hole is provided in the air passage to make the air passage communicate with the mounting chamber, so as to make heat in the mounting chamber enter the air passage to accelerate a temperature rising speed of air in the air passage, thus raising a utilization efficiency of the heat during a working process of the clothes dryer, and raising a drying efficiency of the clothes dryer.

[0007] According to an embodiment of the present disclosure, the clothes dryer further includes a motor, disposed in the machine body, located outside of the air passage, and having a motor shaft; and an impeller, disposed on the motor shaft, and located between the air

outlet and the containing chamber to guide an air flow in the air passage into the containing chamber.

[0008] According to an embodiment of the present disclosure, one through hole is provided in a position of the air passage close to the compressor and the motor.

[0009] According to an embodiment of the present disclosure, the through hole has an axis located between the compressor and the motor.

[0010] According to an embodiment of the present disclosure, one through hole is provided between the first heat exchanger and the second heat exchanger and located close to the compressor.

[0011] According to an embodiment of the present disclosure, the through hole is right opposite the compressor.

[0012] According to an embodiment of the present disclosure, the at least one through hole comprises a first through hole and a second through hole, the first through hole is provided in a position of the air passage close to the compressor and the motor, and the second through hole is located between the first heat exchanger and the second heat exchanger.

[0013] According to an embodiment of the present disclosure, the first through hole has an axis located between the compressor and the motor.

[0014] According to an embodiment of the present disclosure, the second through hole is right opposite the compressor.

[0015] Additional aspects and advantages of embodiments of present disclosure will be given in part in the following descriptions, become apparent in part from the following descriptions, or be learned from the practice of the embodiments of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The above and/or additional aspects and advantages of the present disclosure will become apparent and more readily appreciated from the descriptions of embodiments made with reference to the following drawings, in which:

Fig. 1 is a schematic view of a clothes dryer according to an embodiment of the present disclosure.

Reference numerals:

[0017]

clothes dryer 100;
machine body 10;
drum body 20; containing chamber 21;
air passage 30; air outlet 32;
compressor 41; compressor inlet 411; compressor outlet 412; first heat exchanger 42; second heat exchanger 43;
first through hole 51; second through hole 52;
motor 60; motor shaft 61;

impeller 70;
mounting chamber 80.

DETAILED DESCRIPTION

[0018] Examples of the embodiments are shown in the drawings. The same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions. The embodiments described herein with reference to drawings are explanatory, illustrative, and used to generally understand the present disclosure. The embodiments shall not be construed to limit the present disclosure.

[0019] In the following, a clothes dryer 100 according to an embodiment of the present disclosure is described with reference to Fig. 1.

[0020] As shown in Fig. 1, the clothes dryer 100 according to an embodiment of the present disclosure may include a machine body 10, a drum body 20, an air passage 30 and a heat pump system.

[0021] Specifically, the drum body 20 is disposed in the machine body 10 and defines a containing chamber 21 therein. The air passage 30 is disposed in the machine body 10 and has an air outlet 32, and the air outlet 32 is in communication with the containing chamber 21.

[0022] The heat pump system may include a compressor 41, a first heat exchanger 42 and a second heat exchanger 43. The compressor 41 is disposed in the machine body 10 and located outside of the air passage 30. The compressor 41 has a compressor inlet 411 and a compressor outlet 412. The first heat exchanger 42 and the second heat exchanger 43 are both disposed in the air passage 30, the first heat exchanger 42 is in communication with the compressor inlet 411, and the second heat exchanger 43 is in communication with the compressor outlet 412. A refrigerant in the compressor 41, the first heat exchanger 42 and the second heat exchanger 43 releases a lot of heat during conversion from a gaseous refrigerant to a liquid refrigerant, the heat may heat air entering the air passage 30, and heated air is transported into the containing chamber 21 to dry clothes in the containing chamber 21. A specific work principle of the clothes dryer 100 can be understood by those skilled in the art, and will not be described in detail herein.

[0023] The air passage 30 may be provided with at least one through hole in communication with a mounting chamber 80 of the compressor 41. That is, one or more through holes are provided between the air passage 30 and the mounting chamber 80. In this way, heat generated during a working process of the compressor 41 can enter the air passage 30 through the through holes, to accelerate a temperature rising speed of air in the air passage 30. A fan may be provided in the mounting chamber 80, to accelerate an air flowing speed in the mounting chamber 80, so as to make hot air around the compressor 41 enter the air passage 30 more quickly.

[0024] With the clothes dryer 100 according to an embodiment of the present disclosure, the at least one

through hole is provided in the air passage 30 to make the air passage 30 communicate with the mounting chamber 80, so as to make heat in the mounting chamber 80 enter the air passage 30 to accelerate the temperature rising speed of the air in the air passage 30, thus raising a utilization efficiency of the heat during a working process of the clothes dryer 100, and raising a drying efficiency of the clothes dryer 100.

[0025] In some embodiments of the present disclosure, the clothes dryer may further include a motor 60 and an impeller 70. The motor 60 is disposed in the machine body 10 and located outside of the air passage 30, and the motor has a motor shaft 61. The impeller 70 is disposed to the motor shaft 61 and located between the air outlet 32 and the containing chamber 21, to guide air flow in the air passage 30 into the containing chamber 21.

[0026] As shown in Fig. 1, the motor 60 may be disposed in the mounting chamber 80, the motor shaft 61 has a first end connected with the motor 60 and a second end connected with the impeller 70 after penetrating through the air passage 30. The motor 60 drives the impeller 70 to rotate and accelerate the air flow in the air passage 30, thus raising the amount of hot air entering the containing chamber 21 per unit time, and raising the drying efficiency of the clothes dryer 100.

[0027] In a specific embodiment of the present disclosure, the air passage 30 may be provided with one through hole, and the through hole may be provided in a position of the air passage 30 close to the compressor 41 and the motor 60. In this way, heat generated by the compressor 41 and the motor 60 during work may enter the air passage 30 through the through hole, thus further raising the temperature rising speed of the air in the air passage 30, and raising the drying efficiency of the clothes dryer 100.

[0028] Further, the through hole has an axis located between the compressor 41 and the motor 60. In this way, heat irradiated from the compressor 41 and the motor 60 to the surrounding may enter the air passage 30 evenly, to avoid that part of the heat remains in local areas of the mounting chamber 80 and that locally excessive heat in the compressor 41 or the motor 60 influence normal work.

[0029] In another specific embodiment of the present disclosure, the air passage 30 may be provided with only one through hole, and the through hole may be provided between the first heat exchanger 42 and the second heat exchanger 43 and located close to the compressor 41. A fan may be provided in the mounting chamber 80, and the impeller 70 may be provided at the downstream of the air passage 30. Such design is advantageous in that hot air in the mounting chamber 80 may be driven by the fan to enter the air passage 30 quickly, to converge with heat released by the first heat exchanger 42 and the second heat exchanger 43, and that a lot of hot air is driven by the impeller 70 to enter the containing chamber 21 quickly, to raise a drying speed of clothes in the containing chamber 21. It can be understood that the above de-

scription is explanatory and is not constructed to limit the present disclosure.

[0030] In another specific embodiment of the present disclosure, the through hole may be right opposite the compressor 41, thus further raising the temperature rising speed of the air in the air passage 30, and raising a drying efficiency of clothes in the containing chamber 21.

[0031] In some other embodiments of the present disclosure, the through holes may include a first through hole 51 and a second through hole 52, in which the first through hole 51 may be provided in a position of the air passage 30 close to the compressor 41 and the motor 60, and the second through hole 52 may be located between the first heat exchanger 42 and the second heat exchanger 43.

[0032] In other words, part of hot air in the mounting chamber 80 may enter the air passage 30 through the first through hole 51, and the other part of the hot air in the mounting chamber 80 may enter the air passage 30 through the second through hole 52. The hot air can enter the air passage 30 through the first through hole 51 and the second through hole 52 at the same time, so as to raise a speed of the hot air entering the air passage 30, to make a temperature of the air in the air passage 30 rise quickly and transport the air into the containing chamber 21 continuously, thus further raising the drying efficiency of the clothes dryer 100. The first through hole 51 has an axis located between the compressor 41 and the motor 60. The second through hole 52 may be right opposite the compressor 41.

[0033] Other configurations and operation of the clothes dryer 100 according to embodiments of the present disclosure are known for those skilled in the art, which will not be described in detail herein.

[0034] In the specification, it is to be understood that terms such as "bottom," "inner," and "outer," should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present invention be constructed or operated in a particular orientation.

[0035] In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. In the description of the present invention, "a plurality of" means two or more than two, unless specified otherwise.

[0036] In the present invention, unless specified or limited otherwise, the terms "mounted," "connected," "coupled," "fixed" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements, which can be understood by those skilled in the art according to specific

situations.

[0037] In the present invention, unless specified or limited otherwise, a structure in which a first feature is "on" or "below" a second feature may include an embodiment in which the first feature is in direct contact with the second feature, and may also include an embodiment in which the first feature and the second feature are not in direct contact with each other, but are contacted via an additional feature formed therebetween. Furthermore, a first feature "on," "above," or "on top of" a second feature may include an embodiment in which the first feature is right or obliquely "on," "above," or "on top of" the second feature, or just means that the first feature is at a height higher than that of the second feature; while a first feature "below," "under," or "on bottom of" a second feature may include an embodiment in which the first feature is right or obliquely "below," "under," or "on bottom of" the second feature, or just means that the first feature is at a height lower than that of the second feature.

[0038] Reference throughout this specification to "an embodiment," "some embodiments," "an example," "a specific example," or "some examples," means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present disclosure. Thus, the appearances of the phrases in various places throughout this specification are not necessarily referring to the same embodiment or example of the present disclosure. Furthermore, the particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples. Furthermore, different embodiments or examples in this specification can be jointed and combined by those skilled in the art.

[0039] Although explanatory embodiments have been shown and described, it would be appreciated by those skilled in the art that the above embodiments cannot be construed to limit the present disclosure, and changes, alternatives, and modifications can be made in the embodiments without departing from spirit, principles and scope of the present disclosure.

Claims

1. A clothes dryer (100), comprising:

a machine body (10);
a drum body (20), disposed in the machine body (10) and defining a containing chamber (21) therein;
an air passage (30) disposed in the machine body (10) and having an air outlet (32) in communication with the containing chamber (21);
and
a heat pump system, comprising:

a compressor (41), disposed in the machine

body (10), located outside of the air passage (30), and having a compressor inlet (411) and a compressor outlet (412); a first heat exchanger (42), disposed in the air passage (30) and communicating with the compressor inlet (411); and a second heat exchanger (43), disposed in the air passage (30) and communicating with the compressor outlet (412) and the first heat exchanger (42),

wherein hot air generated by the first heat exchanger (42) and the second heat exchanger (43) is transported to the containing chamber (21) through the air outlet (32) of the air passage (30), and the air passage (30) is provided with at least one through hole in communication with a mounting chamber (80) of the compressor (41) of the least one through hole.

2. The clothes dryer (100) according to claim 1, further comprising:

a motor (60), disposed in the machine body (10), located outside of the air passage (30), and having a motor shaft (61); and an impeller (70), disposed on the motor shaft (61), and located between the air outlet (32) and the containing chamber (21) to guide an air flow in the air passage (30) into the containing chamber (21).

3. The clothes dryer (100) according to claim 2, wherein one through hole is provided in a position of the air passage (30) close to the compressor (41) and the motor (60).

4. The clothes dryer (100) according to claim 3, wherein the through hole has an axis located between the compressor (41) and the motor (60).

5. The clothes dryer (100) according to claim 2, wherein one through hole is provided between the first heat exchanger (42) and the second heat exchanger (43) and located close to the compressor (41).

6. The clothes dryer (100) according to claim 5, wherein the through hole is right opposite the compressor (41).

7. The clothes dryer (100) according to claim 2, wherein the at least one through hole comprises a first through hole (51) and a second through hole (52), the first through hole (51) is provided in a position of the air passage (30) close to the compressor (41) and the motor (60), and the second through hole (52) is located between the first heat exchanger (42) and the second heat exchanger (43).

8. The clothes dryer (100) according to claim 7, wherein the first through hole (51) has an axis located between the compressor (41) and the motor (60).

9. The clothes dryer (100) according to claim 7, wherein the second through hole (52) is right opposite the compressor (41).

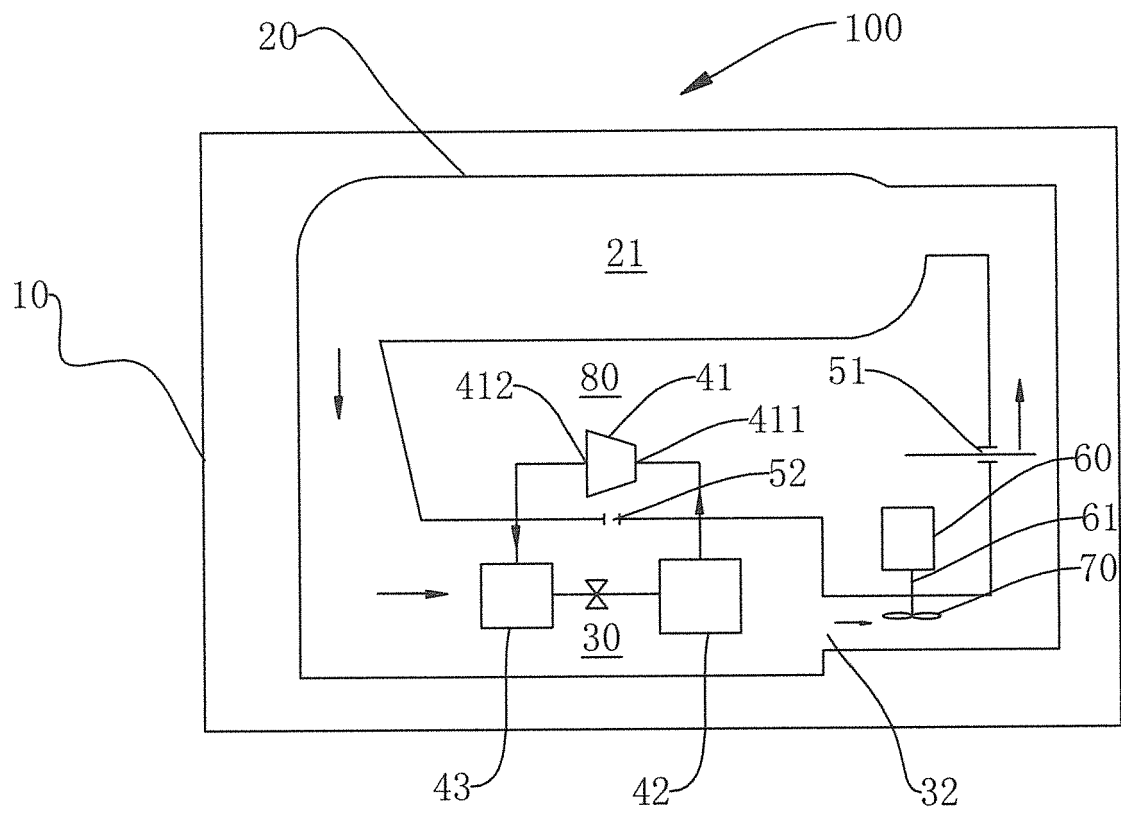


Fig. 1



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Application Number
EP 16 20 0081

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 February 2017	Examiner Bermejo, Marco
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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