GAS-FIRED CLOTHES DRYER CAPABLE OF REDUCING ENERGY CONSUMPTION AND ACHIEVING SAFE USE

Technical Field

The present invention relates to the technical field of gas-fired clothes dryers, in particular to a gas-fired clothes dryer capable of reducing energy consumption and achieving safe use.

Background Art

Gas-fired clothes dryers utilise high-temperature hot air generated by gas combustion to quickly dry clothes. Compared with traditional drying methods, the clothes drying time is greatly shortened. Some high-end gas-fired clothes dryers are also equipped with intelligent control systems, which can automatically adjust the drying temperature and time according to materials and humidities of the clothes, ensuring that the clothes are dried evenly without being damaged by overheating, and meanwhile, energy consumption is saved.

For example, the patent with the publication number CN207376319U discloses a clothes dryer housing structure, which comprises a casing and a door body disposed on the casing; the top of the casing is provided with an air outlet, and the casing is further provided with an air inlet in communication with the air outlet. The present invention also provides a clothes dryer, which comprises a heating device, an air extraction mechanism, a drum, a driving device for driving the drum to rotate, a control device and the above-mentioned clothes dryer housing structure; the drum, the driving device and the control device are all disposed inside the casing; an air inlet duct and an air outlet duct are disposed in the casing, the air inlet duct is in communication with the air inlet and the drum, and the air outlet duct is in communication with the drum and the air outlet; the heating device is disposed inside the air inlet duct or the drum, and the air extraction mechanism is disposed in the air outlet duct; and the heating device, the air extraction mechanism and the driving device are all electrically connected to the control device.

The above-mentioned technology has the following problems: when the clothes dryer is in use, air enters from the air inlet to provide air for the heating device, enabling full combustion of the gas, then smoke of combustion can enter the drum through the air inlet duct to dry the clothes inside the drum, and then the smoke inside the drum can be discharged from the air outlet duct and the air outlet. However, when the clothes dryer is placed and used indoors, it consumes indoor air, thereby reducing the indoor oxygen content, which may seriously affect the user's health.

Therefore, a gas-fired clothes dryer capable of reducing energy consumption and achieving safe use is proposed to solve the above technical problems.

Summary of the Invention

In order to solve the above technical problems, the purpose of the present invention is to provide a gas-fired clothes dryer capable of reducing energy consumption and achieving safe use, which can reduce energy consumption and achieve safe operation.

The technical solution adopted by the present invention to solve the problems is as follows: a gas-fired clothes dryer capable of reducing energy consumption and achieving safe use, comprising a housing; a cavity is disposed inside the housing; a drum with a front opening, a heating device, a driving device and an air extraction mechanism are disposed in the cavity; the heating device and the driving device are both disposed below the drum; the air extraction mechanism is disposed at the rear of the drum; an exhaust duct in communication with the air extraction mechanism is disposed above the air extraction mechanism; an opening is disposed on the housing; an exhaust port is disposed on the exhaust duct; the exhaust port is disposed at the opening; both the exhaust port and the cavity are in communication with the opening; a gas connecting pipe is disposed at the opening; gas inlets and a gas outlet are disposed on the gas connecting pipe; the gas inlets are in communication with the cavity; and the gas outlet is in communication with the exhaust port.

As a further improvement of the above technical solution, the gas connecting pipe comprises an inner ring and an outer ring; the gas outlet is disposed on the inner ring; several partition strips are annularly arrayed between the inner ring and the outer

ring; and the gas inlets are formed between adjacent partition strips.

As a further improvement of the above technical solution, a mounting groove is disposed on the housing; the opening is disposed at the mounting groove; a mounting frame with a central opening is disposed inside the mounting groove; a through groove is disposed around an inner edge of the mounting frame; a limiting groove is in communication with a side of the through groove; a limiting block is disposed on an outer edge of the outer ring; and the limiting block and the limiting groove are clamped.

As a further improvement of the above technical solution, a first mounting hole is disposed between the outer ring and the inner ring; a second mounting hole is disposed on the inner edge of the mounting frame; and a threaded hole is disposed on a side of the exhaust port, and projections of the first mounting hole and the second mounting hole overlap with the threaded hole.

As a further improvement of the above technical solution, an extension part extends outwardly from the exhaust port, and the inner ring is sleeved on the extension part.

As a further improvement of the above technical solution, several screw holes corresponding to each other are disposed on both the mounting groove and the mounting frame.

The beneficial effects of the present invention are as follows: the gas connecting pipe can be connected to a smoke exhaust pipe in communication with the outside. In use, air can enter the cavity from the gas inlets of the gas connecting pipe, thereby providing air for the heating device. The smoke in the drum can be discharged into the exhaust duct through the air extraction mechanism, and finally the smoke can be discharged from the gas outlet of the gas connecting pipe. When the air enters the cavity, it flows through the outer wall of the drum, and the heat of the drum preheats the air, thereby reducing the energy consumption of the heating device. The gas-fired clothes dryer provides air to the heating device through the gas connecting pipe without consuming indoor air, thereby not reducing the indoor oxygen content and being capable of providing safety guarantees for users.

Brief Description of the Drawings

The present invention is further explained and illustrated below in conjunction with the description of the drawings and the specific embodiments.

FIG. 1 is a first structural view of the present invention;

FIG. 2 is a side view of the present invention;

FIG. 3 is a sectional view of part A-A of FIG. 2;

FIG. 4 is a partially enlarged view of part A of FIG. 3;

FIG. 5 is a sectional view of part B-B of FIG. 2;

FIG. 6 is a partially enlarged view of part B of FIG. 5;

FIG. 7 is a second structural view of the present invention;

FIG. 8 is a partially enlarged view of part C of FIG. 7;

FIG. 9 is a structural view of a gas connecting pipe of the present invention; and

FIG. 10 is a structural view of a mounting frame of the present invention.

In the figures: 1-housing, 11-cavity, 12-opening, 13-mounting groove, 2-drum, 3-heating device, 4-driving device, 5-air extraction mechanism, 6-exhaust duct, 61-exhaust port, 62-threaded hole, 63-extension part, 7-gas connecting pipe, 71-gas inlet, 72-gas outlet, 73-inner ring, 74-outer ring, 75-partition strip, 76-limiting block, 77-first mounting hole, 8-mounting frame, 81-through groove, 82-limiting groove, 83-second mounting hole, 9-screw hole.

Detailed Description of Embodiments

This section describes the specific embodiments of the present invention in detail. The preferred embodiments of the present invention are shown in the accompanying drawings. The function of the accompanying drawings is to supplement the textual description of the specification with figures, enabling an intuitive and visual understanding of each technical feature and the overall technical solution of the present invention. However, this shall not be construed as limiting the scope of protection of the present invention.

In the description of the present invention, it should be understood that orientations or positional relationships indicated by orientation descriptions such as

"upper", "lower", "front", "rear", "left", and "right" are orientations or positional relationships shown based on the accompanying drawings, which are merely for facilitating the description of the present invention and simplifying the description, but do not indicate or imply that the referred device or element must have a specific orientation and be constructed and operated in a specific orientation, and thus shall not be construed as limiting the present invention.

In the description of the present invention, "several" means one or more, "plurality" means two or more, "greater than", "smaller than", "more than", etc. are understood as excluding the number itself, and "above", "below", "within", etc. are understood as including the number itself. If there is a description that "first" and "second" are merely for the purpose of distinguishing technical features, it should not be understood as indicating or implying the relative importance, or implicitly indicating the number of the indicated technical features, or implicitly indicating the sequence of the indicated technical features.

In the description of the present invention, unless otherwise explicitly specified, terms such as "arrange", "install", and "connect" should be understood in a broad sense, and those skilled in the art can reasonably determine the specific meanings of the above terms in the present invention with reference to the specific content of the technical solutions.

Referring to FIG. 1 to FIG. 10, a gas-fired clothes dryer capable of reducing energy consumption and achieving safe use comprises a housing 1. A cavity 11 is disposed inside the housing 1. A drum 2 with a front opening 12, a heating device 3, a driving device 4, and an air extraction mechanism 5 are disposed inside the cavity 11. The heating device 3 and the driving device 4 are both disposed below the drum 2, and the air extraction mechanism 5 is disposed at the rear of the drum 2. An exhaust duct 6 in communication with the air extraction mechanism 5 is disposed above the air extraction mechanism 5. An opening 12 is disposed on the housing 1, and an exhaust port 61 is disposed on the exhaust duct 6. The exhaust port 61 is disposed at the opening 12, and both the exhaust port 61 and the cavity 11 are in communication with the opening 12. A gas connecting pipe 7 is disposed at the opening 12, and gas

inlets 71 and a gas outlet 72 are disposed on the gas connecting pipe 7. The gas inlets 71 are in communication with the cavity 11, and the gas outlet 72 is in communication with the exhaust port 61.

The gas connecting pipe 7 can be connected to a smoke exhaust pipe in communication with the outside. In use, air can enter the cavity 11 from the gas inlets 71 of the gas connecting pipe 7, thereby providing air for the heating device 3. The smoke inside the drum 2 can be discharged into the exhaust duct 6 through the air extraction mechanism 5, and finally the smoke can be discharged from the gas outlet 72 of the gas connecting pipe 7. When the heating device 3 malfunctions or fails to fully combust the gas, part of the carbon dioxide will enter the gas inlets 71 of the gas connecting pipe 7 from the cavity 11 and be discharged to the outside through the smoke exhaust pipe, which will not pollute the indoor air and can prevent harm to human health;

the gas connecting pipe 7 can be connected to a smoke exhaust pipe in communication with the outside. In use, air can enter the cavity 11 from the gas inlet 71 of the gas connecting pipe 7, thereby providing air for the heating device 3. The smoke inside the drum 2 can be discharged into the exhaust duct 6 through the air extraction mechanism 5, and finally the smoke can be discharged from the gas outlet 72 of the gas connecting pipe 7; and

when air enters the cavity 11, it flows through the outer wall of the drum 2, and the heat of the drum 2 preheats the air, thereby reducing the energy consumption of the heating device 3. The gas-fired clothes dryer provides air for the heating device 3 through the gas connecting pipe 7 without consuming indoor air, thereby not reducing the indoor oxygen content and being capable of providing safety guarantees for users.

In a preferred embodiment, the gas connecting pipe 7 comprises an inner ring 73 and an outer ring 74. The gas outlet 72 is disposed on the inner ring 73. Several partition strips 75 are annularly arrayed between the inner ring 73 and the outer ring 74, and gas inlets 71 are formed between adjacent partition strips 75.

In a preferred embodiment, a mounting groove 13 is disposed on the housing 1, and the opening 12 is disposed at the mounting groove 13. A mounting frame 8 with a

central opening is disposed in the mounting groove 13. A through groove 81 is disposed around an inner edge of the mounting frame 8, and a limiting groove 82 is in communication with a side of the through groove 81. A limiting block 76 is disposed on an outer edge of the outer ring 74, and the limiting block 76 and the limiting groove 82 are clamped; and

during installation, the limiting block 76 can pass through the through groove 81. By rotating the gas connecting pipe 7, the limiting block 76 can be rotated into the limiting groove 82, thereby mounting the gas connecting pipe 7 on the mounting frame 8.

In a preferred embodiment, a first mounting hole 77 is disposed between the outer ring 74 and the inner ring 73. A second mounting hole 83 is disposed on the inner edge of the mounting frame 8. A threaded hole 62 is disposed on a side of the exhaust port 61, and projections of the first mounting hole 77 and the second mounting hole 83 overlap with the threaded hole 62. By passing screws through the first mounting hole 77 and the second mounting hole 83 in sequence and screwing them with the threaded hole 62, the gas connecting pipe 7, the mounting frame 8, and the exhaust duct 6 can be mounted more stably.

In a preferred embodiment, to achieve better airtightness, an extension part 63 extends outwardly from the exhaust port 61, and the inner ring 73 is sleeved on the extension part 63.

In a preferred embodiment, for the convenience of installation, several screw holes 9 corresponding to each other are disposed on both the mounting groove 13 and the mounting frame 8. By passing screws through the screw holes 9 on the mounting frame 8 and the screw holes 9 on the mounting groove 13, the mounting frame 8 can be mounted on the mounting groove 13.

The above are merely preferred embodiments of the present invention, and shall not be construed as limiting the patent scope of the present invention. Under the inventive concept of the present invention, any equivalent structural transformation made by using the contents of the specification and accompanying drawings of the present invention, or direct or indirect application in other related technical fields, shall be

included in the patent protection scope of the present invention.

Claims

1. A gas-fired clothes dryer capable of reducing energy consumption and achieving safe use, characterized in that

it comprises: a housing (1), wherein a cavity (11) is disposed inside the housing (1), a drum (2) with a front opening (12), a heating device (3), a driving device (4), and an air extraction mechanism (5) are disposed inside the cavity (11), the heating device (3) and the driving device (4) are both disposed below the drum (2), the air extraction mechanism (5) is disposed at the rear of the drum (2), and an exhaust duct (6) in communication with the air extraction mechanism (5) is disposed above the air extraction mechanism (5); and

an opening (12) is disposed on the housing (1), an exhaust port (61) is disposed on the exhaust duct (6), the exhaust port (61) is disposed at the opening (12), both the exhaust port (61) and the cavity (11) are in communication with the opening (12), a gas connecting pipe (7) is disposed at the opening (12), gas inlets (71) and a gas outlet (72) are disposed on the gas connecting pipe (7), the gas inlets (71) are in communication with the cavity (11); and the gas outlet (72) is in communication with the exhaust port (61).

2. The gas-fired clothes dryer capable of reducing energy consumption and achieving safe use according to claim 1, characterized in that

the gas connecting pipe (7) comprises an inner ring (73) and an outer ring (74); the gas outlet (72) is disposed on the inner ring (73); several partition strips (75) are annularly arrayed between the inner ring (73) and the outer ring (74); and the gas inlets (71) are formed between the adjacent partition strips (75).

3. The gas-fired clothes dryer capable of reducing energy consumption and achieving safe use according to claim 2, characterized in that

a mounting groove (13) is disposed on the housing (1); the opening (12) is disposed at the mounting groove (13); a mounting frame (8) with a central opening is

disposed inside the mounting groove (13); a through groove (81) is disposed around an inner edge of the mounting frame (8), and a limiting groove (82) is in communication with a side of the through groove (81); a limiting block (76) is disposed on an outer edge of the outer ring (74); and the limiting block (76) and the limiting groove (82) are clamped.

4. The gas-fired clothes dryer capable of reducing energy consumption and achieving safe use according to claim 3, characterized in that

a first mounting hole (77) is disposed between the outer ring (74) and the inner ring (73); a second mounting hole (83) is disposed on the inner edge of the mounting frame (8); a threaded hole (62) is disposed on a side of the exhaust port (61); and projections of the first mounting hole (77) and the second mounting hole (83) overlap with the threaded hole (62).

5. The gas-fired clothes dryer capable of reducing energy consumption and achieving safe use according to claim 2, characterized in that

an extension part (63) extends outwardly from the exhaust port (61); and the inner ring (73) is sleeved on the extension part (63).

6. The gas-fired clothes dryer capable of reducing energy consumption and achieving safe use according to claim 3, characterized in that

several screw holes (9) corresponding to each other are disposed on the mounting groove (13) and the mounting frame (8).