

COMBUSTION FURNACE

BACKGROUND

Field of the Invention

[0001] The present invention relates to a combustion furnace, and more particularly
5 to a combustion furnace with a combustion-assisting device.

Description of Related Art

[0002] The combustion furnace can be used to burn combustibles. The furnace body
of the existing combustion furnace has a combustion chamber, and combustibles (such
as joss paper, branches, leaves, paper, etc.) can be put into the combustion chamber
10 through the feeding port for combustion.

[0003] However, most of the existing combustion furnaces have problems such as
easy smoldering, incomplete combustion, and low combustion efficiency. Once the
convection holes or through holes are blocked, the combustion efficiency will be greatly
reduced, and then black smoke will be generated, affecting air quality.

SUMMARY

[0004] An objective of the present invention is to provide a combustion furnace with a
combustion-assisting device, which can effectively maintain the combustion efficiency.

[0005] To achieve the above objective, a combustion furnace of the present invention
comprises:

20 [0006] a furnace body including an inner annular wall, an accommodating space
formed by the inner annular wall, an annular flange protruding from the inner annular
wall and located in the accommodating space, and an exhaust port located above the
accommodating space, wherein the annular flange divides the accommodating space
into a combustion space and a debris-collecting space located below the combustion
25 space, the furnace body further includes a feeding port provided on the inner annular
wall corresponding to the combustion space;

[0007] a sieve frame disposed in the accommodating space and abutting against the annular flange, the sieve frame including a plurality of sieve holes and a positioning hole located at a center of the sieve frame;

[0008] a combustion-assisting device including a combustion-assisting pipe and a gas supply unit;

[0009] wherein the combustion-assisting pipe is disposed in the accommodating space and inserted in the positioning hole of the sieve frame, and the combustion-assisting pipe includes a gas-guiding channel, a plurality of combustion-assisting holes communicating the gas-guiding channel with the combustion space, and an air inlet communicating with the gas-guiding channel;

[0010] the gas supply unit includes a blower and an air-conveying pipe connecting the blower, the blower is used to generate a gas, and the air-conveying pipe is connected to the air inlet;

[0011] a heat-insulating net including a main heat-insulating portion, wherein the main heat-insulating portion is fixed to the inner annular wall through a main support assembly and is separated from the furnace body, the main heat-insulating portion is provided with a grid entrance located corresponding to the feeding port;

[0012] a combustion-assisting member disposed in the combustion space and in an annular shape, wherein the combustion-assisting member includes a plurality of convex portions and a plurality of concave portions connected in sequence, the convex portions and the concave portions are arranged at intervals, every two adjacent convex portions and the concave portion connected therebetween jointly form a combustion-assisting space; and

[0013] the furnace body further includes a middle annular wall portion and an arc-top wall is connected between the inner annular wall and the middle annular wall portion.

[0014] It can be seen from the above that when the combustion furnace burns

combustibles, the blower of the gas supply unit is started. At this time, the activated blower outputs a gas, and the gas enters the gas-guiding channel of the combustion-assisting pipe through the air-conveying pipe. Subsequently, the gas is output from the combustion-assisting holes of the combustion-assisting pipe to the combustion space of the furnace body, so that the combustion space of the furnace body is filled with the gas sent in from the outside, thereby effectively maintaining the combustion efficiency. In addition, it can also cooperate with the exhaust port of the furnace body to generate convection, so as to effectively maintain the combustion efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

FIG. 1 is a three-dimensional view of the combustion furnace according to one embodiment of the present invention.

FIG. 2 is a cross-sectional view of the combustion furnace according to one embodiment of the present invention; and

FIG. 3 is a cross-sectional view of another embodiment of the combustion furnace of the present invention.

DETAILED DESCRIPTION

[0016] A combustion furnace in accordance with one embodiment of the present invention is shown in FIGs. 1-2, and includes:

[0017] A furnace body 10, a sieve frame 20, and a combustion-assisting device 30, where:

[0018] The furnace body 10 includes an inner annular wall 11, an accommodating space 12 formed by the inner annular wall 11, an annular flange 13 protruding from the inner annular wall 11 and located in the accommodating space 12, and an exhaust port 14 located above the accommodating space 12. The annular flange 13 divides the

accommodating space 12 into a combustion space 121 and a debris-collecting space 122 located below the combustion space 121. In this embodiment, the furnace body 10 further includes a feeding port 15 provided on the inner annular wall 11 corresponding to the combustion space 121, and a debris-removing port 16 provided on the inner
5 annular wall 11 corresponding to the debris-collecting space 122.

[0019] Preferably, the inner annular wall 11 of the furnace body 10 includes a plurality of convection holes 11A. These convection holes 11A are arranged in an annular manner on the inner annular wall 11 and are used to enhance the air convection in the accommodating space 12.

10 [0020] The sieve frame 20 is set in the accommodating space 12 of the furnace body 10 and abuts against the annular flange 13. The sieve frame 20 includes a plurality of sieve holes 21 and a positioning hole 22 located at the center of the sieve frame 20.

[0021] The combustion-assisting device 30 includes a combustion-assisting pipe 31 and a gas supply unit 32.

15 [0022] The combustion-assisting pipe 31 is disposed in the accommodating space 12 of the furnace body 10 and partially exposed outside the accommodating space 12. At the same time, the combustion-assisting pipe 31 is inserted in the positioning hole 22 of the sieve frame 20, and includes a gas-guiding channel 311, a plurality of combustion-assisting holes 312 communicating the gas-guiding channel 311 with the
20 combustion space 121, and an air inlet 313 communicating with the gas-guiding channel 311. In this embodiment, the combustion-assisting pipe 31 further includes an outer pipe section 314 located outside the bottom of the furnace body 10, and the air inlet 313 is disposed in the outer pipe section 314 and located outside the furnace body 10. In another implementation, the combustion-assisting pipe 31 can also be completely
25 set inside the accommodating space 12 of the furnace body 10, so that the air inlet 313 is located in the debris-collecting space 122 of the furnace body 10 or on the outer

surface of the furnace body 10.

[0023] The gas supply unit 32 includes a blower 321 and an air-conveying pipe 322 connecting the blower 321. The blower 321 is used to generate a gas. The air-conveying pipe 322 is connected to the air inlet 313 of the combustion-assisting pipe 31. The gas generated by the blower 321 enters the gas-guiding channel 311 of the combustion-assisting pipe 31 through the air-conveying pipe 322 and is output from the combustion-assisting holes 312 of the combustion-assisting pipe 31 to the combustion space 121 of the furnace body 10.

[0024] Preferably, define the height that the combustion-assisting pipe 31 extends into the combustion space 121 as a first height D1, the height of the combustion space 121 as a second height D2. The ratio of the first height D1 to the second height D2 is between 1:2 and 2:3, including the ratios of 1:2 and 2:3.

[0025] A heat-insulating net 40 includes a main heat-insulating portion 41. The main heat-insulating portion 41 is fixed to the inner annular wall 11 of the furnace body 10 through a main support assembly 50 with multiple supports and is separated from the furnace body 10 in the radial direction. The main heat-insulating portion 41 is provided with a grid entrance 411 located corresponding to the feeding port 15, so that the combustibles can enter the combustion space 121 through the feeding port 15 and the grid entrance 411.

[0026] In this way, the furnace body 10 of the present creation can separate the user from the inner annular wall 11 by setting the heat-insulating net 40 outside its inner annular wall 11, so as to prevent the user from directly touching the inner annular wall 11 and getting burned.

[0027] In this embodiment, the above-mentioned main heat-insulating portion 41 is a one-piece mesh sheet and surrounds the entire inner annular wall 11 in the circumferential direction. However, the present creation is not limited thereto. In other

embodiments, the one-piece mesh-sheet-shaped main heat-insulating portion 41 can be changed to only cover part of the inner annular wall 11 in the circumferential direction; or the main heat-insulating portion 41 can be changed to segmented mesh sheets, and these mesh sheets surround the inner annular wall 11 in a fixed or non-fixed interval arrangement.

[0028] A combustion-assisting member 60 is disposed in the combustion space 121 and is generally in an annular shape. The combustion-assisting member 60 includes a plurality of convex portions 61 and a plurality of concave portions 62 connected in sequence. The convex portions 61 and the concave portions 62 are arranged at intervals. One concave portion 62 is connected between every two adjacent convex portions 61, and one convex portion 61 is connected between every two adjacent concave portions 62. The combustion-assisting member 60 includes an inner surface 60A and an outer surface 60B opposite to each other. The outer surface 60B faces the inner annular wall 11. The combustion-assisting member 60 surrounds and defines a center O. The inner surface 60A of the convex portion 61 is closer to the center O than the inner surface 60A of the concave portion 62. Every two adjacent convex portions 61 and the concave portion 62 connected therebetween jointly form a combustion-assisting space 63. Thereby, the combustion-assisting member 60 forms a plurality of combustion-assisting spaces 63, and the combustion-assisting spaces 63 are used for air circulation.

[0029] Preferably, the furnace body 10 further includes a middle annular wall portion 17 and a top annular wall portion 18. The inner annular wall 11, the middle annular wall portion 17, and the top annular wall portion 18 are all cylindrical. One end of the top annular wall portion 18 is connected to the middle annular wall portion 17, and the exhaust port 14 is located at the other end of the top annular wall portion 18 that is not connected to the middle annular wall portion 17. The diameter of the inner annular wall

11 is larger than that of the middle annular wall portion 17, and the diameter of the middle annular wall portion 17 is larger than that of the top annular wall portion 18, so that the accommodating space 12 is larger than the space surrounded by the middle annular wall portion 17, and the space formed by the middle annular wall portion 17 is larger than the space formed by the top annular wall portion 18. An arc-top wall 19 is connected between the inner annular wall 11 and the middle annular wall portion 17. The arc-top wall 19 is arc-shaped and is used to prevent the ash from floating up.

[0030] Preferably, the top annular wall portion 18 is in a mesh shape and includes a plurality of ventilation holes 181 to enhance the air convection efficiency.

[0031] In another embodiment, please refer to FIG. 3, the difference is that the end of the middle annular wall portion 17 that is not connected to the arc-top wall 19 is not connected to the top annular wall portion 18, but is connected to a curved extension pipe 70. The curved extension pipe 70 is used to guide the hot air out of the room, and the exhaust port 14 is located at the end of the curved extension pipe 70 that is not connected to the middle annular wall portion 17. The curved extension pipe 70 further includes a mesh-shaped section 72, and the mesh-shaped section 72 is adjacent to the exhaust port 14.

[0032] The above is the description of the assembly and structure of the combustion furnace of the present invention. Here, the use of the combustion furnace will be further described:

[0033] As shown in FIG. 2, when the combustion furnace burns combustibles, the blower 321 of the gas supply unit 32 is started. At this time, the activated blower 321 outputs a gas, and the gas enters the gas-guiding channel 311 of the combustion-assisting pipe 31 through the air-conveying pipe 322. Subsequently, the gas is output from the combustion-assisting holes 312 of the combustion-assisting pipe 31 to the combustion space 121 of the furnace body 10, so that the combustion space

121 of the furnace body 10 is filled with the gas sent in from the outside, thereby effectively maintaining the combustion efficiency. In addition, it can also cooperate with the exhaust port 14 of the furnace body 10 to generate convection, so as to effectively maintain the combustion efficiency.

5 [0034] It is worth mentioning that since the air-conveying pipe 322 of the gas supply unit 32 of the present creation is directly connected to the air inlet 313 of the combustion-assisting pipe 31, the gas generated by the gas supply unit 32 can enter the combustion-assisting pipe 31 without loss, and enter the combustion space 121 of the furnace body 10 from the combustion-assisting holes 312 of the
10 combustion-assisting pipe 31, thereby effectively maintaining the combustion efficiency. At the same time, due to the design that the gas generated by the gas supply unit 32 can enter the combustion-assisting pipe 31 without loss, it can prevent the gas output by the gas supply unit 32 from blowing towards the debris-collecting space 122 of the furnace body 10, so as to avoid the ashes in the debris-collecting space 122 from being
15 raised and reducing the combustion efficiency of the combustion furnace.

WHAT IS CLAIMED IS:

1. A combustion furnace comprising:

a furnace body including an inner annular wall, an accommodating space formed by the inner annular wall, an annular flange protruding from the inner annular wall and located in the accommodating space, and an exhaust port located above the accommodating space, wherein the annular flange divides the accommodating space into a combustion space and a debris-collecting space located below the combustion space, the furnace body further includes a feeding port provided on the inner annular wall corresponding to the combustion space;

a sieve frame disposed in the accommodating space and abutting against the annular flange, the sieve frame including a plurality of sieve holes and a positioning hole located at a center of the sieve frame;

a combustion-assisting device including a combustion-assisting pipe; wherein the combustion-assisting pipe is disposed in the accommodating space and inserted in the positioning hole of the sieve frame, and the combustion-assisting pipe includes a gas-guiding channel, a plurality of combustion-assisting holes communicating the gas-guiding channel with the combustion space, and an air inlet communicating with the gas-guiding channel;

a heat-insulating net including a main heat-insulating portion, wherein the main heat-insulating portion is fixed to the inner annular wall through a main support assembly and is separated from the furnace body, the main heat-insulating portion is provided with a grid entrance located corresponding to the feeding port;

a combustion-assisting member disposed in the combustion space and in an annular shape, wherein the combustion-assisting member includes a plurality of convex portions and a plurality of concave portions connected in sequence, the convex portions and the concave portions are arranged at intervals, every two

adjacent convex portions and the concave portion connected therebetween jointly form a combustion-assisting space; and

the furnace body further includes a middle annular wall portion and an arc-top wall is connected between the inner annular wall and the middle annular wall portion.

2. The combustion furnace as claimed in claim 1, wherein one end of the middle annular wall portion that is not connected to the arc-top wall is connected to a curved extension pipe, the exhaust port is located at one end of the curved extension pipe that is not connected to the middle annular wall portion, the curved extension pipe further includes a mesh-shaped section, and the mesh-shaped section is adjacent to the exhaust port.

3. The combustion furnace as claimed in claim 1, wherein the furnace body further includes a top annular wall portion, one end of the top annular wall portion is connected to the middle annular wall portion, the exhaust port is located at another end of the top annular wall portion that is not connected to the middle annular wall portion, and the top annular wall portion is in a mesh shape and includes a plurality of ventilation holes.

4. The combustion furnace as claimed in claim 1, wherein the inner annular wall of the furnace body includes a plurality of convection holes A arranged in an annular manner on the inner annular wall.

5. The combustion furnace as claimed in claim 1, wherein a height that the combustion-assisting pipe extends into the combustion space is a first height, a height of the combustion space is a second height, and a ratio of the first height to the second height is between 1:2 and 2:3.

6. The combustion furnace as claimed in claim 1, wherein the combustion-assisting device further includes a gas supply unit, the gas supply unit includes a blower and an air-conveying pipe connecting the blower, the blower is used

to generate a gas, and the air-conveying pipe is connected to the air inlet.