Claims

What is claimed is:

1. A method of generating mixed whirling flow, comprising:

mixing for the first time air and fuel gas into a rotating mixed gas;

mixing for the second time the rotating mixed gas into swirly mixed gas;

forming said generated swirly mixed gas into a reflected and mixed whirling fuel gas flow with a tiny bottom but a big top end.

2. A burner, comprising:

a gas-separating box (30) used to import fuel gas and air respectively;

a mixing device used to mix air and fuel gas from the gas-separating box (30) to form a mixed whirling flow; and

a third mixing device used to reflect the mixed whirling flow so that the mixed whirling flow rushes out of a flame hole (11) and then forms a mixed and whirling upwards fuel gas flow with a tiny bottom but a big top end;

wherein said mixing device comprises a top lid (10) and a mixing box (20) to compose a first mixing device and a second mixing device, and said top lid (10) is in a shape of sleeve;

said first mixing device mixes for the first time air and fuel gas from the gas-separating box (30) into a rotating mixed flow inclined upwardly, and said second mixing device mixes the rotating mixed flow from the first mixing device and fuel gas from the gas-separating box (30) into a mixed whirling flow.

3. The burner according to claim 2, wherein said mixing box (20) is a box having a countersunk hole (25) communicated with said centric hole (31), on the side wall of the box several grooves (21) are disposed at a distance from each other, whose amount and position are corresponding to that of the fuel gas outlets (37)。

4. The burner according to claim 2, wherein said gas-separating box (30) has a centric hole (31) through which air enters and at least one inlet (32) through which

fuel gas enters, and on the top surface of the gas-separating box (30), several fuel gas outlets (37) are provided.

5. The burner according to claim 2, wherein said mixing box (20) is a box having a countersunk hole (25) communicated with said centric hole (31), on the side wall of the box several grooves (21) are disposed at a distance from each other, whose amount and position are corresponding to that of the fuel gas outlets (37), and communicating holes (210) are disposed on the surface of the grooves (21), communicating with air in said countersunk hole (25), and the grooves (21) mix air and fuel gas primarily to form a rotating mixed flow inclined upwardly.

6. The burner according to claim 5, wherein said grooves (21) are inclined upwards; an angle between said grooves (21) and the bottom surface of the mixing box (20) is 10 to 80 degree; said grooves (21) are at least 50mm long; and cross section of said grooves (21) is in a shape of square or inverted trapezoidal.

7. The burner according to claim 2, wherein the flame hole (11) on the top lid (10) for the mixed flow to rush out has a frustoconic surface, which makes the whirly mixed flow be reflected onto a reflecting plate (40) on the mixing box (20) and then rush out of the flame hole (11) to form a mixed whirling fuel gas flow with a tiny bottom but a big top end; and size of the flame hole (11) is one fifth to one third the size of the top lid.

8. The burner according to claim 5, wherein the fuel gas outlets (37) are evenly distributed, while the communicating holes (210) are evenly distributed too; diameter of the fuel gas outlets (37) are 0.5 to 3mm, and diameter of the communicating holes (210) are 0.5 to 3mm; and said top lid (10) is screwed with the gas-separating box (30).

9. The burner according to claim 7, wherein a mounting throughhole (29) is arranged on the top surface of said mixing box (20), said mounting throughhole (29) is provided with a insulating sleeve (50) which comprises a round plate mounted within the countersunk hole (25) and a ring (51) matched with the mounting

throughhole (29), on the insulating sleeve (50) a reflecting plate (40) is arranged, which is connected with a zero wire of a ion flame controller, and said mixing box (20) has two pulse ignition rods.

10. A combustion method of a burner, comprising the following steps:

S01. separating air and flue gas into two flow, wherein a first flow of air enters into the centric hole (31) and then into the grooves (21) through the evenly distributed communicating holes (210), a second flow of fuel gas enters into the grooves (21) through the fuel gas outlets (37) to mix with the first flow of air, and then goes upwards along the inclined grooves (21) to form a rotating mixed flow inclined upwardly ;

S02. mixing again rotationally the rotating mixed flow that is inclined upwardly in a second mixing chamber (100) to form a swirly mixed flow;

S03. let the rotating mixed flow and the swirly mixed flow collide with each other and flow around, wherein the mixed flow is reflected onto the reflecting plate due to the frustoconic surface of the flame hole (11) and then rush out of the flame hole (11) to form a whirling mixed fuel gas flow with a tiny bottom and a large top end, which produces a flame looked like hurricane with a small bottom but large head when ignited.

11. A combustion method of a burner, comprising the following steps:

S01. let air enter into a gas-separating box (30), and then go upwards through grooves (21) evenly distributed on a mixing box (20) to form a rotating flow inclined upwardly;

S02. mixing rotationally the rotating flow that is inclined upwardly and the fuel gas from the fuel gas outlets in a second mixing chamber (100) to form a swirly mixed flow;

S03. the swirly mixed flow collides with each other and flows around, and is reflected onto the reflecting plate due to the frustoconic surface of the flame hole (11) and then rushes out of the flame hole (11) to form a mixed fuel gas flow with a

What is claimed is:

1. A burner, comprising:

a gas-separating box (30) used to import fuel gas and air respectively;

a mixing device used to mix the air and the fuel gas from the gas-separating box (30) to form a mixed whirling flow; and

a third mixing device used to reflect the mixed whirling flow so that the mixed whirling flow rushes out of a flame hole (11) and then forms a mixed and whirling upwards fuel gas flow with a bottom smaller than a top end;

wherein said mixing device comprises a top lid (10) and a mixing box (20) to compose a first mixing device and a second mixing device, and said top lid (10) is in a shape of sleeve;

said first mixing device mixes for first time the air and the fuel gas from the gas-separating box (30) into a rotating mixed flow inclined upwardly, and said second mixing device mixes the rotating mixed flow from the first mixing device and fuel gas from the gas-separating box (30) into a mixed whirling flow.

2. The burner according to claim 1, wherein said mixing box (20) is a box having a countersunk hole (25) communicated with said centric hole (31), on the side wall of the box several grooves (21) are disposed at a distance from each other, whose amount and position are corresponding to that of the fuel gas outlets (37)。

3. The burner according to claim 1, wherein said gas-separating box (30) has a centric hole (31) through which air enters and at least one inlet (32) through which fuel gas enters, and on the top surface of the gas-separating box (30), several fuel gas outlets (37) are provided.

4. The burner according to claim 1, wherein said mixing box (20) is a box having a countersunk hole (25) communicated with said centric hole (31), on the side wall of the box several grooves (21) are disposed at a distance from each other, whose amount and position are corresponding to that of the fuel gas outlets (37),

and communicating holes (210) are disposed on the surface of the grooves (21), communicating with air in said countersunk hole (25), and the grooves (21) mix air and fuel gas primarily to form a rotating mixed flow inclined upwardly.

5. The burner according to claim 4, wherein said grooves (21) are inclined upwards; an angle between said grooves (21) and the bottom surface of the mixing box (20) is 10 to 80 degree; said grooves (21) are at least 50mm long; and cross section of said grooves (21) is in a shape of square or inverted trapezoidal.

6. The burner according to claim 1, wherein the flame hole (11) on the top lid (10) for the mixed flow to rush out has a frustoconic surface, which makes the whirly mixed flow be reflected onto a reflecting plate (40) on the mixing box (20) and then rush out of the flame hole (11) to form a mixed whirling fuel gas flow with a bottom smaller than a top end; and size of the flame hole (11) is one fifth to one third the size of the top lid.

7. The burner according to claim 4, wherein the fuel gas outlets (37) are evenly distributed, while the communicating holes (210) are evenly distributed too; diameter of the fuel gas outlets (37) are 0.5 to 3mm, and diameter of the communicating holes (210) are 0.5 to 3mm; and said top lid (10) is screwed with the gas-separating box (30).

8. The burner according to claim 6, wherein a mounting throughhole (29) is arranged on the top surface of said mixing box (20), said mounting throughhole (29) is provided with a insulating sleeve (50) which comprises a round plate mounted within the countersunk hole (25) and a ring (51) matched with the mounting throughhole (29), on the insulating sleeve (50) the reflecting plate (40) is arranged, which is connected with a zero wire of a ion flame controller, and said mixing box (20) has two pulse ignition rods.

9. A combustion method of a burner, comprising the following steps:

S01. separating air and flue gas into two flow, wherein a first flow of air enters into a centric hole (31) and then into grooves (21) through an evenly distributed

communicating holes (210), a second flow of fuel gas enters into the grooves (21) through the fuel gas outlets (37) to mix with the first flow of air, and then goes upwards along the grooves (21) to form a rotating mixed flow inclined upwardly ;

S02. mixing again rotationally the rotating mixed flow that is inclined upwardly in a second mixing chamber (100) to form a swirly mixed flow;

S03. let the rotating mixed flow and the swirly mixed flow collide with each other and flow around, wherein the mixed flow is reflected onto a reflecting plate due to a frustoconic surface of a flame hole (11) and then rush out of the flame hole (11) to form a whirling mixed fuel gas flow with a bottom smaller than a top end, which produces a flame with a bottom smaller than a top end when ignited.

10. A combustion method of a burner, comprising the following steps:

S01. let air enter into a gas-separating box (30), and then go upwards through grooves (21) evenly distributed on a mixing box (20) to form a rotating flow inclined upwardly;

S02. mixing rotationally the rotating flow that is inclined upwardly and the fuel gas from the fuel gas outlets in a second mixing chamber (100) to form a swirly mixed flow;

S03. the swirly mixed flow collides with each other and flows around, and is reflected onto a reflecting plate due to the frustoconic surface of a flame hole (11) and then rushes out of the flame hole (11) to form a mixed fuel gas flow with a bottom smaller than a top end, which produces a flame with a bottom smaller than a top end when ignited.

11. A combustion method of a burner, comprising the following steps:

S01. air enters the burner through an air inlet (200) to form a rotating air flow (900);

S02. a portion of the air flow (900) flows along the circumferential direction, and other portion mixes with fuel gas from fuel gas inlets (210) to form a outward whirling flow;

S03. the outward whirling flow collides with each other and flows around, and is reflected onto a reflecting plate due to a frustoconic surface of the flame hole (11) and then rushes out of the flame hole (11) to form a mixed fuel gas flow with a bottom smaller than a top end, which produces a flame with a bottom smaller than a top end when ignited.