

BURNER, GAS COOKER, AND INTEGRATED ELECTRICAL APPLIANCE

FIELD CROSS-REFERENCE TO RELATED APPLICATIONS

5 [0001] This application claims priority to Chinese Patent Application No. 202411026557.2, titled "BURNER, GAS COOKER, AND INTEGRATED ELECTRICAL APPLIANCE" and filed with China National Intellectual Property Administration on July 29, 2024, Chinese Patent Application No. 202411026125.1, titled "BURNER, GAS COOKER, AND INTEGRATED ELECTRICAL APPLIANCE" and filed with China National Intellectual Property Administration
10 on July 29, 2024, Chinese Patent Application No. 202421811820.4, titled "BURNER, GAS COOKER, AND INTEGRATED ELECTRICAL APPLIANCE" and filed with China National Intellectual Property Administration on July 29, 2024, and Chinese Patent Application No. 202421809709.1, titled "BURNER, GAS COOKER, AND INTEGRATED ELECTRICAL APPLIANCE" and filed with China National Intellectual Property Administration on July 29, 2024,
15 the entire disclosure of which are incorporated herein by reference.

FIELD

[0002] The invention relates to the technical field of gas cookers, and in particular, to a burner, a gas cooker, and an integrated electrical appliance.
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BACKGROUND

[0003] Combustion of burners of gas cookers requires participation of primary air and secondary air. Generally, the primary air is mixed with a gas through an entrainment effect. However, the flow rate of the primary air is affected by structures and operation conditions.
25 Supplement of the secondary air depends on buoyancy and entrainment effects, which places high demands on sizes of components and parts. Therefore, there is an improvement room for thermal efficiency of the gas cooker.

SUMMARY

[0004] The invention aims to solve one of the technical problems in the related art to some extent. To this end, the invention provides a burner.
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[0005] In order to achieve the above purpose, according to a first aspect of the invention, the invention discloses a burner. The burner includes a first flame outlet and a second flame outlet. The first flame outlet is located farther from a center of the burner than the second flame outlet. One of the first flame outlet and the second flame outlet is adapted for ejecting of a gas and blown air, and another one of the first flame outlet and the second flame outlet is adapted for ejecting of the gas and induced air.
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[0006] In the invention, one of the first flame outlet and the second flame outlet may be used for ejecting of the gas and the blown air. The blown air provides sufficient oxygen to allow for full combustion of the gas ejected from the one of the first flame outlet and the second flame outlet. In addition, the blown air may generate excess oxygen to assist in combustion of the gas ejected from the other one of the first flame outlet and the second flame outlet. In this way, the gas ejected from the other one of the first flame outlet and the second flame outlet can also be fully burned under effects of the induced air and the excess oxygen provided by the blown air. With such an
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arrangement, the gas ejected from the first flame outlet and the second flame outlet can be fully burned with high combustion efficiency. Therefore, it is beneficial to improvement of thermal efficiency of a gas cooker.

[0007] In some embodiments of the invention, a flame generated at the other one of the first flame outlet and the second flame outlet is adapted to perform flame stabilization on the one of the first flame outlet and the second flame outlet.

[0008] In some embodiments of the invention, the burner further includes a first mixture outlet channel. The first mixture outlet channel has a tip end formed as the first flame outlet and at least one first corner located upstream of the first flame outlet.

[0009] In some embodiments of the invention, the first mixture outlet channel includes a first upstream flow segment, a first midstream flow segment, and a first downstream flow segment with a tip end formed as the first flame outlet. The at least one first corner is formed at an intersection between the first upstream flow segment and the first midstream flow segment and at an intersection between the first midstream flow segment and the first downstream flow segment.

[0010] In some embodiments of the invention, the first downstream flow segment is inclined away from the center of the burner from the first midstream flow segment.

[0011] In some embodiments of the invention, the burner further includes a second mixture outlet channel. The second mixture outlet channel has a tip end formed as the second flame outlet and at least one second corner located upstream of the second flame outlet.

[0012] In some embodiments of the invention, the second mixture outlet channel includes a second upstream flow segment, and a second downstream flow segment with a tip end formed as the second flame outlet. The at least one second corner is formed at an intersection between the second upstream flow segment and the second downstream flow segment.

[0013] In some embodiments of the invention, the second downstream flow segment is inclined away from the center of the burner from the second upstream flow segment.

[0014] In some embodiments of the invention, the first flame outlet is of an annular slit shape and surrounds the second flame outlet; and/or the second flame outlet is of an annular slit shape.

[0015] In some embodiments of the invention, the burner further includes a plurality of first flame outlets, and the plurality of first flame outlets are arranged at intervals in a ring shape and surround the second flame outlet; and/or the burner further includes a plurality of second flame outlets, and the plurality of second flame outlets are arranged at intervals in a ring shape.

[0016] In some embodiments of the invention, the burner further includes a stove and a flame cover. The stove has a first receiving cavity and a second receiving cavity, and the flame cover is disposed at the stove and includes a first flame cover, a second flame cover, and a third flame cover. The first flame cover surrounds the second flame cover. The first flame outlet is formed between the first flame cover and the second flame cover and is in communication with the first receiving cavity. The second flame cover surrounds the third flame cover. The second flame outlet is formed between the second flame cover and the third flame cover and is in communication with the second receiving cavity.

[0017] In some embodiments of the invention, a first mixture outlet channel is formed between the first flame cover and the second flame cover, and a second mixture outlet channel is formed between the second flame cover and the third flame cover.

[0018] In some embodiments of the invention, the stove has a first annular wall, a second annular wall, and a third annular wall. The first annular wall surrounds the second annular wall, and the first receiving cavity is formed between the first annular wall and the second annular wall. The second annular wall surrounds the third annular wall, and the second receiving cavity is

formed between the second annular wall and the third annular wall. The first flame cover is of a ring shape and is disposed at the first annular wall. The second flame cover is of a ring shape and is disposed at the second annular wall. The third flame cover is of a ring shape and is disposed at the third annular wall.

5 **[0019]** In some embodiments of the invention, the burner further includes a first induction tube connected to the stove and in communication with the first receiving cavity, and a second induction tube connected to the stove and in communication with the second receiving cavity. One of a mixture intaking end of the first induction tube and a mixture intaking end of the second induction tube is adapted to receive the gas and the blown air, and the other one of the mixture intaking end
10 of the first induction tube and the mixture intaking end of the second induction tube is adapted to receive the gas and the induced air.

[0020] In some embodiments of the invention, the burner further includes a fan adapted to provide the blown air. The fan is connected and fixed to the first induction tube or the second induction tube.

15 **[0021]** In some embodiments of the invention, the first flame outlet and the second flame outlet are disposed at a same wall. A thickness of a wall between the first flame outlet and the second flame outlet is smaller than or equal to 6 mm.

[0022] In some embodiments of the invention, the first flame outlet is adapted for ejecting of the gas and the induced air, and the second flame outlet is adapted for ejecting of the gas and the
20 blown air. The burner further includes a third flame outlet adapted for ejecting of the gas and the induced air, and the third flame outlet is located closer to the center of the burner than the second flame outlet.

[0023] In some embodiments of the invention, the burner further includes a stove and a flame cover disposed at the stove. The flame cover has the first flame outlet, the second flame outlet, and
25 the third flame outlet.

[0024] In some embodiments of the invention, the flame cover includes an outer flame cover having the first flame outlet and the second flame outlet, an inner flame cover having the third flame outlet and surrounded by the outer flame cover, and a middle flame cover shielding a space between the outer flame cover and the inner flame cover.

30 **[0025]** In some embodiments of the invention, the inner flame cover and the middle flame cover are connected and fixed to each other; and/or the inner flame cover is disposed at the center of the burner; and/or the inner flame cover is a porous ceramic plate.

[0026] In some embodiments of the invention, a top surface of the middle flame cover is planar; and/or the top surface of the middle flame cover is formed as a top surface of the flame cover; and/or the middle flame cover is adapted to be abutted against an inner wall of the outer flame
35 cover in a radial direction of the burner.

[0027] In some embodiments of the invention, the outer flame cover includes a first flame cover, a second flame cover, and a third flame cover. The first flame cover surrounds the second flame cover, and the first flame outlet is formed between the first flame cover and the second flame
40 cover. The second flame cover surrounds the third flame cover, and the second flame outlet is formed between the second flame cover and the third flame cover. The middle flame cover is disposed between the third flame cover and the inner flame cover to shield the space between the outer flame cover and the inner flame cover.

[0028] In some embodiments of the invention, the middle flame cover and the third flame cover are integrally formed.

[0029] In some embodiments of the invention, the stove has a first receiving cavity, a second

receiving cavity, and a third receiving cavity. The first flame outlet is in communication with the first receiving cavity. The second flame outlet is in communication with the second receiving cavity. The third flame outlet is in communication with the third receiving cavity. The burner further includes a first induction tube, a second induction tube, and a third induction tube. The first
 5 induction tube is in communication with the first receiving cavity and adapted to receive the gas and the induced air. The second induction tube is in communication with the second receiving cavity and adapted to receive the gas and the blown air. The third induction tube is in communication with the third receiving cavity and adapted to receive the gas and the induced air.

[0030] In some embodiments of the invention, a plurality of first flame outlets are provided, and the plurality of first flame outlets are arranged at intervals in a ring shape and surrounding the
 10 second flame outlet; and/or a plurality of second flame outlets are provided, and the plurality of second flame outlets are arranged at intervals in a ring shape and surrounding the third flame outlet; and/or a plurality of third flame outlets are provided.

[0031] In some embodiments of the invention, the first flame outlet is of an annular slit shape and surrounds the second flame outlet; and/or the second flame outlet is of an annular slit shape and surrounds the third flame outlet; and/or the third flame outlet is of an annular slit shape.

[0032] A second aspect of the invention discloses a gas cooker. The gas cooker includes the burner as described above.

[0033] In some embodiments of the invention, the gas cooker further includes a valve adapted
 20 to adjust a gas flow rate. When gas supply to one of the first flame outlet and the second flame outlet is interrupted by the valve, the valve maintains gas supply to the other one of the first flame outlet and the second flame outlet, and a fan of the gas cooker is in an operation state to provide the blown air.

[0034] In some embodiments of the invention, when gas supply to the second flame outlet is interrupted by the valve, the valve maintains gas supply to the first flame outlet and/or a third
 25 flame outlet, and the fan of the gas cooker is in the operation state to provide the blown air.

[0035] A third aspect of the invention discloses an integrated electrical appliance. The integrated electrical appliance includes the gas cooker as described above.

[0036] According to a fourth aspect of the invention, the invention discloses a burner. The
 30 burner includes: a first flame outlet adapted for ejecting of a gas and induced air; a second flame outlet adapted for ejecting of the gas and blown air and located closer to a center of the burner than the first flame outlet; and a third flame outlet adapted for ejecting of the gas and the induced air and located closer to the center of the burner than the second flame outlet.

[0037] In some embodiments of the invention, a flame generated at the first flame outlet is adapted to perform flame stabilization on the second flame outlet.

[0038] In some embodiments of the invention, the first flame outlet and the second flame outlet are disposed at a same wall. A thickness of a wall between the first flame outlet and the second
 35 flame outlet is smaller than or equal to 6 mm.

[0039] In some embodiments of the invention, the burner further includes a first mixture outlet
 40 channel, and the first mixture outlet channel has a tip end formed as the first flame outlet and at least one first corner located upstream of the first flame outlet; and/or the burner further includes a second mixture outlet channel, and the second mixture outlet channel has a tip end formed as the second flame outlet and at least one second corner located upstream of the second flame outlet.

[0040] In some embodiments of the invention, the first mixture outlet channel of the burner
 45 includes a first downstream flow segment, and the first downstream flow segment has a tip end formed as the first flame outlet and is inclined away from or towards the center of the burner from

bottom to top; and/or the second mixture outlet channel of the burner includes a second downstream flow segment, and the second downstream flow segment has a tip end formed as the second flame outlet and is inclined away from or towards the center of the burner from bottom to top.

5 **[0041]** In some embodiments of the invention, the burner further includes a stove and a flame cover disposed at the stove. The flame cover has the first flame outlet, the second flame outlet, and the third flame outlet.

10 **[0042]** In some embodiments of the invention, the flame cover includes an outer flame cover having the first flame outlet and the second flame outlet, an inner flame cover having the third flame outlet and surrounded by the outer flame cover, and a middle flame cover shielding a space between the outer flame cover and the inner flame cover.

[0043] In some embodiments of the invention, the inner flame cover and the middle flame cover are connected and fixed to each other; and/or the inner flame cover is disposed at the center of the burner; and/or the inner flame cover is a porous ceramic plate.

15 **[0044]** In some embodiments of the invention, a top surface of the middle flame cover is planar; and/or the top surface of the middle flame cover is formed as a top surface of the flame cover; and/or the middle flame cover is adapted to be abutted against an inner wall of the outer flame cover in a radial direction of the burner.

20 **[0045]** In some embodiments of the invention, the outer flame cover includes a first flame cover, a second flame cover, and a third flame cover. The first flame cover surrounds the second flame cover, and the first flame outlet is formed between the first flame cover and the second flame cover. The second flame cover surrounds the third flame cover, and the second flame outlet is formed between the second flame cover and the third flame cover. The middle flame cover is disposed between the third flame cover and the inner flame cover to shield the space between the
25 outer flame cover and the inner flame cover.

[0046] In some embodiments of the invention, the middle flame cover and the third flame cover are integrally formed.

30 **[0047]** In some embodiments of the invention, the stove has a first receiving cavity, a second receiving cavity, and a third receiving cavity. The first flame outlet is in communication with the first receiving cavity. The second flame outlet is in communication with the second receiving cavity. The third flame outlet is in communication with the third receiving cavity. The burner further includes a first induction tube, a second induction tube, and a third induction tube. The first induction tube is in communication with the first receiving cavity and be adapted to receive the gas and the induced air. The second induction tube is in communication with the second receiving
35 cavity and be adapted to receive the gas and the blown air. The third induction tube is in communication with the third receiving cavity and be adapted to receive the gas and the induced air.

40 **[0048]** In some embodiments of the invention, a plurality of first flame outlets are provided, and the plurality of first flame outlets are arranged at intervals in a ring shape and surround the second flame outlet; and/or a plurality of second flame outlets are provided, and the plurality of second flame outlets are arranged at intervals in a ring shape and surround the third flame outlet; and/or a plurality of third flame outlets are provided.

45 **[0049]** In some embodiments of the invention, the first flame outlet is of an annular slit shape and surrounds the second flame outlet; and/or the second flame outlet is of an annular slit shape and surrounds the third flame outlet; and/or the third flame outlet is of an annular slit shape.

[0050] A fifth aspect of the invention discloses a gas cooker. The gas cooker includes the

burner as described above.

[0051] In some embodiments of the invention, the gas cooker includes a valve adapted to adjust a gas flow rate.

[0052] In some embodiments of the invention, when gas supply to the second flame outlet is interrupted by the valve, the valve maintains gas supply to the first flame outlet and/or a third flame outlet, and a fan of the gas cooker is in an operation state to provide the blown air.

[0053] A sixth aspect of the invention discloses an integrated electrical appliance. The integrated electrical appliance includes the gas cooker as described above.

[0054] In the technical solution of the invention, the second flame outlet is used for ejecting of the blown air and the gas. The blown air provides sufficient oxygen to allow for full combustion of the gas ejected from the second flame outlet. The first flame outlet is used for ejecting of the induced air and the gas. The third flame outlet is used for ejecting of the induced air and the gas. The second flame outlet is formed between the first flame outlet and the third flame outlet. Secondary air required for a flame generated at the first flame outlet can be provided by excess oxygen generated from the blown air, and secondary air required for a flame generated at the third flame outlet can also be provided by the excess oxygen generated from the blown air. With this arrangement, the gas ejected from the first flame outlet, the second flame outlet, and the third flame outlet can be fully burned, resulting in the high combustion efficiency and contributing to the improvement of the thermal efficiency of the gas cooker.

[0055] Other advantages of the invention will be in part set forth below, become apparent in part from the following description, or can be learned by practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0056] In order to clearly explain technical solutions of the embodiments of the invention or in the related art, accompanying drawings used in the description of the embodiments or the related art are briefly described below. Obviously, the accompanying drawings as described below are merely some embodiments of the invention. Based on structures illustrated in these drawings, other designs can be obtained by those of ordinary skill in the art without creative effort.

[0057] FIG. 1 is a schematic view of a burner according to some embodiments, in which a first flame outlet is used for ejecting of blown air and a gas, and a second flame outlet is used for ejecting of induced air and the gas.

[0058] FIG. 2 is an enlarged view at part A in FIG. 1.

[0059] FIG. 3 is a schematic view of a burner according to some embodiments in a different viewing angle from that of FIG. 1, in which a first flame outlet is used for ejecting of blown air and a gas, and a second flame outlet is used for ejecting of induced air and the gas.

[0060] FIG. 4 is an enlarged view at part B in FIG. 3.

[0061] FIG. 5 is a partially cross-sectional view of a structure of the burner illustrated in FIG. 1.

[0062] FIG. 6 is a schematic view of a burner according to some embodiments, in which a first flame outlet is used for ejecting of induced air and a gas, and a second flame outlet is used for ejecting of blown air and the gas.

[0063] FIG. 7 is a partially cross-sectional view of a structure of the burner illustrated in FIG. 6.

[0064] FIG. 8 is an exploded view of a stove and a flame cover according to some embodiments.

[0065] FIG. 9 is a cross-sectional view of an assembling structure of a stove and a flame cover

according to some embodiments.

[0066] FIG. 10 is a cross-sectional view of an assembling structure of a stove and a flame cover according to some embodiments, in which a cross-section of the assembling structure is different from that shown in FIG. 9.

5 **[0067]** FIG. 11 is an enlarged view at part C in FIG. 10.

[0068] FIG. 12 is a cross-sectional view of an assembling structure of a stove and a flame cover according to some embodiments in a different viewing angle from that in FIG. 10, in which a cross-section of the assembling structure is different from that shown in FIG. 9.

[0069] FIG. 13 is an enlarged view at part D in FIG. 12.

10 **[0070]** FIG. 14 is an enlarged view at part D in FIG. 12, in which an airflow direction is illustrated.

[0071] FIG. 15 is a schematic view of a burner according to some embodiments.

[0072] FIG. 16 is a cross-sectional view of an assembling structure of a flame cover and a stove according to some embodiments.

15 **[0073]** FIG. 17 is a cross-sectional view of an assembling structure of a flame cover and a stove according to some embodiments, in which a cross-section of the assembling structure is different from that shown in FIG. 16.

[0074] FIG. 18 is an enlarged view at part A in FIG. 17.

20 **[0075]** FIG. 19 is a partially schematic structural view of a burner according to some embodiments, in which a flame cover is omitted.

[0076] FIG. 20 is a partially schematic structural view of a burner according to some embodiments, in which a flame cover is omitted.

[0077] FIG. 21 is a schematic view of an outer flame cover according to some embodiments.

[0078] FIG. 22 is a cross-sectional view of a structure illustrated in FIG. 21.

25 **[0079]** FIG. 23 is an enlarged view at part B in FIG. 22, in which an airflow direction is illustrated.

[0080] FIG. 24 is an enlarged view at part B in FIG. 22.

[0081] FIG. 25 is a schematic view of an outer flame cover according to some embodiments, in which a different structure from that shown in FIG. 21 is illustrated.

30 **[0082]** FIG. 26 is a cross-sectional view of a structure illustrated in FIG. 25.

[0083] FIG. 27 is an enlarged view at part C in FIG. 26.

[0084] FIG. 28 is a schematic view of an assembling structure of a flame cover and a stove according to some embodiments.

[0085] FIG. 29 is a cross-sectional view of the structure illustrated in FIG. 28.

35 **[0086]** FIG. 30 is an enlarged view at part D in FIG. 29.

[0087] Description of Reference Numerals:

40 **[0088]** burner 100, flame cover 1000, first flame cover 1110, second flame cover 1120, third flame cover 1130, first mixture outlet channel 1500, first upstream flow segment 1510, first midstream flow segment 1520, first downstream flow segment 1530, first flame outlet 1531, first corner 1540, second mixture outlet channel 1600, second upstream flow segment 1610, second downstream flow segment 1620, second flame outlet 1621, second corner 1630, stove 2000, first annular wall 2100, second annular wall 2200, third annular wall 2300, first receiving cavity 2410, second receiving cavity 2420, first induction tube 3100, mixture intaking end 3110 of the first induction tube, second induction tube 3200, mixture intaking end 3210 of the second induction tube, fan 4000, outer flame cover 1100, inner flame cover 1200, middle flame cover 1300, first
45 cover 1310, second cover 1320, third flame outlet 1430, third receiving cavity 2430, third

induction tube 3300, mixture intaking end 3310 of third induction tube.

[0089] The implementation, functional characteristics, and advantages of the invention will be further described with reference to the drawings.

DETAILED DESCRIPTION

5 **[0090]** In the related art, a gas cooker includes a valve. After the valve is opened, a canned liquefied gas or a piped natural gas is delivered through pipelines. The gas passes through the valve and is ejected through a nozzle. The gas from the nozzle is injected into an interior of a burner. Air entrainment is synchronously implemented during the injection of the gas into the interior of the burner. A description of the air entrainment may refer to the related art, which is generally based
10 on Venturi principle. During the injection of the gas into the interior of the burner, a negative pressure is formed in a surrounding environment, causing surrounding air to be entrained into the interior of the burner along with the injection of the gas (such air entering the interior of the burner through an entrainment action is called induced air, which is primary air). The induced air and the gas are ejected from the interior of the burner after being mixed in the interior of the burner, and
15 then are ignited to generate a flame. During gas combustion, the surrounding environment supplement air (which is called secondary air) to the flame through buoyancy and entrainment effects, assisting in the gas combustion. It can be seen that an amount of the primary air and an amount of the secondary air are core factors in ensuring full combustion of the ejected gas. However, the amount of the primary air is affected by structures and operation conditions, while
20 supplement of the secondary air relies on the buoyancy and entrainment effects, which is a passive supplement and places high demands on sizes of components and parts. Therefore, the combustion of the gas only realized by the induced air and the entrainment of the surrounding air is mostly in oxygen-poor combustion state, leading to insufficient combustion. For this problem, the invention improves an improved burner to at least improve a combustion degree of the gas to some extent,
25 contributing to improvement of thermal efficiency of a gas cooker.

[0091] A first aspect of the invention discloses a burner 100. As illustrated in FIG. 1 to FIG. 7, the burner 100 includes a first flame outlet 1531 and a second flame outlet 1621. The first flame outlet 1531 is located farther from a center of the burner than the second flame outlet 1621. Further,
30 one of the first flame outlet 1531 and the second flame outlet 1621 is used for an ejection of blown air and a gas, and another one of the first flame outlet 1531 and the second flame outlet 1621 is used for ejecting of induced air and the gas. In the technical solution of the invention, one of the first flame outlet 1531 and the second flame outlet 1621 may be used for ejecting of the gas and the blown air, and the blown air can provide sufficient oxygen to allow for full combustion of the gas ejected from the one of the first flame outlet 1531 and the second flame outlet 1621. In addition,
35 the blown air may generate excess oxygen to assist in combustion of the gas ejected from the other one of the first flame outlet 1531 and the second flame outlet 1621. In this way, the gas ejected from the other one of the first flame outlet 1621 and the second flame outlet 1621 can also be fully burned under the actions of the induced air and the excess oxygen provided by the blown air. With such an arrangement, the gas ejected from the first flame outlet 1621 and the second flame outlet
40 1621 can be fully burned with high combustion efficiency. Therefore, it is beneficial to an improvement of thermal efficiency of a gas cooker.

[0092] In an exemplary embodiment of the invention, the burner 100 includes the first flame outlet 1531 and the second flame outlet 1621. One of the first flame outlet 1531 and the second flame outlet 1621 is used for ejecting of the blown air and the gas, and the other one of the first
45 flame outlet 1531 and the second flame outlet 1621 is used for ejecting of the induced air and the gas. Accordingly, two implementations including a first implementation and a second

implementation are provided. In the first implementation as illustrated in FIG. 1 to FIG. 5, the first flame outlet 1531 is used for ejecting of the blown air and the gas, and the second flame outlet 1621 is used for ejecting of the induced air and the gas. In the second implementation as illustrated in FIG. 6 and FIG. 7, the first flame outlet 1531 is used for ejecting of the induced air and the gas, and the second flame outlet 1621 is used for ejecting of the blown air and the gas.

[0093] The following description will be set forth by using an example where the first flame outlet 1531 is used for ejecting of the blown air and the gas, and the second flame outlet 1621 is used for ejecting of the induced air and the gas. The second flame outlet 1621 is used for ejecting of the induced air and the gas, i.e., the induced air and the gas enter the interior of the burner 100, then are ejected from the interior of the burner 100 through the second flame outlet 1621, and finally are ignited to form the flame. As described above, gas supply may be from either the canned liquefied gas or the piped natural gas, and the gas cooker includes a valve. After the valve is opened, the gas is delivered along gas pipelines. The gas flows through the valve and is ejected through the nozzle. The gas ejected from the nozzle is injected into the interior of the burner 100. The air entrainment is implemented synchronously during the injection of the gas into the interior of the burner 100. In this way, the induced air enters the interior of the burner 100 along with the gas. Subsequently, the induced air and the gas are ejected from the second flame outlet 1621.

[0094] The first flame outlet 1531 is used for ejecting of the blown air and the gas, i.e., the blown air and the gas enter the interior of the burner 100, then are ejected from the interior of the burner 100 through the first flame outlet 1531, and finally are ignited to form the flame. As described above, the gas supply may be from the canned liquefied gas or the piped natural gas, and the gas cooker includes a valve. After the valve is opened, the gas is delivered along the gas pipeline. The gas flows through the valve and is ejected through the nozzle. The gas ejected from the nozzle is injected into the interior of the burner 100. During this process, the blown air is provided and generated by fluid machinery. For example, the blown air is provided by forced blowing of a fan 4000. The blown air enters the interior of the burner 100 and is mixed with the gas (the blown air is used as the primary air). Subsequently, the gas is ejected from the first flame outlet 1531. Compared to the induced air, the blown air can provide oxygen of a sufficient amount. In this way, the gas ejected from the first flame outlet 1531 can be in a rich-oxygen combustion state, allowing the gas ejected from the first flame outlet 1531 to be fully burned (a flame generated at the first flame outlet 1531 can still entrain secondary air from the surrounding environment for the combustion).

[0095] The gas ejected from the second flame outlet 1621 cannot be fully burned by relying solely on the induced air and the entrainment of the surrounding air. Since the blown air may be ejected from the first flame outlet 1531, the first flame outlet 1531 may provide enough oxygen. As a result, the blow air can participate in the combustion of the gas ejected from the first flame outlet 1531, and the excess oxygen of the blown air can also be supplemented into the mixture of the induced air and the gas ejected from the second flame outlet 1621, to assist in the combustion of the gas ejected from the second flame outlet 1621. Compared to the method in which the secondary air is supplemented from the surrounding environment through the entrainment effect, the excess oxygen provided by the blown air ejected from the first flame outlet 1531 is more actively supplemented to the mixture of the induced air and the gas ejected from the second flame outlet 1621. In this way, the gas ejected from the second flame outlet 1621 is fully burned (the flame generated at the second flame outlet 1621 still to entrain the secondary air from the surrounding environment for the combustion).

[0096] It can be seen that through the above solution, the gas ejected from the first flame outlet

1531 and the second flame outlet 1621 are fully burned with high combustion efficiency, which is beneficial to the improvement of the thermal efficiency of the gas cooker. It can be understood that the reference herein to sufficient combustion is described relative to a combustion state in which the combustion is only based on the induced air and the entrainment of the surrounding air. Similar to the solution where the first flame outlet 1531 is used for ejecting of the blown air and the gas and the second flame outlet 1621 is used for ejecting of the induced air and the gas, the solution where the first flame outlet 1531 is used for ejecting of the induced air and the gas and the second flame outlet 1621 is used for ejecting of the blown air and the gas has similar technical effects, and details thereof will be omitted herein.

[0097] Further, the first flame outlet 1531 is located farther from the center of the burner 100 than the second flame outlet 1621. The center of the burner 100 refers to a center of a flame ejecting range of the burner 100. That is, when the burner 100 is observed from top to bottom, the first flame outlet 1531 is located more outward than the second flame outlet 1621, and the second flame outlet 1621 is located more inward than the first flame outlet 1531, i.e., a minimum distance between the first flame outlet 1531 and the center of the burner 100 is greater than a minimum distance between the second flame outlet 1621 and the center of the burner 100. It can be understood that the orientation in the invention uses a use environment where the gas cooker is mounted as a reference. A side of the gas cooker close to the ground refers to a down (bottom) side, and a side of the gas cooker away from the ground refers to an up (top) side.

[0098] As illustrated in FIG. 1 to FIG. 5, the following description will be set forth by the example where the first flame outlet 1531 is used for ejecting of the blown air and the gas and the second flame outlet 1621 is used for ejecting of the induced air and the gas. Generally, when flame strength is adjusted for the gas cooker, for example, when the flame strength is adjusted from high to low, the flame gradually extinguishes from outside to inside. Since the first flame outlet 1531 is designed to be located more outward than the second flame outlet 1621, when the flame strength is adjusted from high to low, a flame at the first flame outlet 1531 is extinguished earlier than a flame at the second flame outlet 1621, i.e., gas supply to the second flame outlet 1621 is still maintained when gas supply to the first flame outlet 1531 is interrupted. In this case, the blown air may still be introduced. The blown air is ejected from the first flame outlet 1531 and is supplemented to the mixture of the induced air and the gas ejected from the second flame outlet 1621, allowing the gas ejected from the second flame outlet 1621 to be sufficiently burned.

[0099] As illustrated in FIG. 6 and FIG. 7, the following description will be set forth by an example where the first flame outlet 1531 is used for ejecting of the induced air and the gas and the second flame outlet 1621 is used for ejecting of the blown air and the gas. Since the first flame outlet 1531 is designed to be located more outward than the second flame outlet 1621, the first flame outlet 1531 is used for ejecting of the induced air and the gas, while the second flame outlet 1621 is used for ejecting of the blown air and the gas. In addition to the excess oxygen ejected from the second flame outlet 1621 being supplemented to the mixture of the induced air and the gas ejected from the first outlet 1531, a flame formed at the first flame outlet 1531 is more likely to entrain the air from the surrounding environment, further improving a full combustion effect.

[00100] In some embodiments, a flame generated at the other one of the first flame outlet 1531 and the second flame outlet 1621 is adapted to perform flame stabilization on the one of the first flame outlet 1531 and the second flame outlet 1621. The phrase “the one of the first flame outlet 1531 and the second flame outlet 1621” refers to an object for ejecting of the blown air and the gas, and phase “the other one of the first flame outlet 1531 and the second flame outlet 1621” refers to an object for ejecting of the induced air and the gas. For example, when the first flame

outlet 1531 is used for ejecting of the blown air and the gas and the second flame outlet 1621 is used for ejecting of the induced air and the gas, the one of the first flame outlet 1531 and the second flame outlet 1621 is the first flame outlet 1531, and the other one of the first flame outlet 1531 and the second flame outlet 1621 is the second flame outlet 1621. For another example, when the first flame outlet 1531 is used for ejecting of the induced air and the gas and the second flame outlet 1621 is used for ejecting of the blown air and the gas, the one of the first flame outlet 1531 and the second flame outlet 1621 is the second flame outlet 1621, and the other one of the first flame outlet 1531 and the second flame outlet 1621 is the first flame outlet 1531.

[00101] In an exemplary embodiment of the invention, the following description will be set forth by the example where the first flame outlet 1531 is used for ejecting of the blown air and the gas and the second flame outlet 1621 is used for ejecting of the induced air and the gas. It can be understood that the solution where “the first flame outlet 1531 is used for ejecting of the induced air and the gas and the second flame outlet 1621 is used for ejecting of the blown air and the gas” has similar technical effects, and details thereof are omitted herein. The blown air and the gas are ejected from the first flame outlet 1531. The inventor finds that although the full combustion of the gas can be realized by the blown air, a flow rate of the mixture of the blown air and the gas ejected from the first flame outlet 1531 is relatively large through an action of the blown air, and a speed, at which the gas leaves from the first flame outlet 1531 is greater than a burning rate of the gas, easily causing a flame separation phenomenon. Further, since the induced air and the gas are ejected from the second flame outlet 1621, the induced air is obtained through natural induction by ejecting the gas through the nozzle without being generated based on the fluid machinery. A speed at which the gas leaves from the second flame outlet 1621 is not much different from a burning speed of the gas, which can realize stable combustion. That is, a flame formed at the second flame outlet 1621 is in a stable state. Since the flame formed at the second flame outlet 1621 is more stable, the flame generated at the second flame outlet 1621 may be used for performing flame stabilization on the first flame outlet 1531.

[00102] In other words, the flame formed at the second flame outlet 1621 can both realize heating for a cooker and serve as a flame stabilization hole/flame stabilization groove. Accordingly, since the second flame outlet 1621 is used for ejecting of the induced air and the gas, the gas ejected from the second flame outlet 1621 has a more stable burning state. By adjustment of the second flame outlet 1621 relative to the first flame outlet 1531 in position, angle and distance, the flame formed at the second flame outlet 1621 can ignite the gas ejected from the first flame outlet 1531. For example, the flame formed at the second flame outlet 1621 can heat a root of the gas ejected from the first flame outlet 1531 to ignite the gas ejected from the first flame outlet 1531. When leaving the first flame outlet 1531 quickly, the gas is ignited by the flame formed at the second flame outlet 1621, causing the gas quickly leaving from the first flame outlet 1531 to be burned at the first flame outlet 1531. In this way, occurrence of the flame separation phenomenon at the first flame outlet 1531 is suppressed, providing a flame stabilization effect on the first flame outlet 1531, and further improving the combustion efficiency. In particular, when the flames formed at the first flame outlet 1531 and the second flame outlet 1621 heat the cooker, the flames spread outwards due to blocking of the cooker. When the first flame outlet 1531 is located more outward than the second flame outlet 1621, outward spreading of the flame formed at the second flame outlet 1621 makes it easier to be in contact with the gas ejected from the first flame outlet 1531, igniting the gas ejected from the first flame outlet 1531. Therefore, the flame stabilization effect on the first flame outlet 1531 can be further improved.

[00103] As illustrated in FIG. 10 to FIG. 13, in some embodiments, the burner 100 includes a

first mixture outlet channel 1500. A tip end of the first mixture outlet channel 1500 is formed as a first flame outlet 1531. Further, the first mixture outlet channel 1500 has at least one first corner 1540. The first corner 1540 is located upstream of the first flame outlet 1531. A mixture delivered along the first mixture outlet channel 1500 needs to flow through the first corner 1540 before being ejected from the first flame outlet 1531. The arrangement of the first corner 1540 is beneficial to further uniform mixing of the mixture and deceleration of the mixture. As a result, uniformity and stability of the mixture ejected from the first flame outlet 1531 is improved.

[00104] In another exemplary embodiment of the invention, the first mixture outlet channel 1500 includes a first upstream flow segment 1510, a first midstream flow segment 1520, and a first downstream flow segment 1530. One of the at least one first corner 1540 is formed at an intersection between the first upstream flow segment 1510 and the first midstream flow segment 1520. One of the at least one first corner 1540 is also formed at an intersection between the first midstream flow segment 1520 and the first downstream flow segment 1530. The first downstream flow segment 1530 has a tip end formed as the first flame outlet 1531.

[00105] In an exemplary embodiment of the invention, the mixture entering the interior of the burner 100 flows along the first mixture outlet channel 1500 and is finally discharged from the first flame outlet 1531. The first upstream flow segment 1510 is located upstream of the first midstream flow segment 1520. The first midstream flow segment 1520 is located upstream of the first downstream flow segment 1530. The mixture flows through the first upstream flow segment 1510, the first midstream flow segment 1520, and the first downstream flow segment 1530 sequentially, and is finally discharged from the first flame outlet 1531. In this embodiment, the first corner 1540 is formed at the intersection between the first upstream flow segment 1510 and the first midstream flow segment 1520, and the mixture is required to be diverted when flowing from the first upstream flow segment 1510 to the first midstream flow segment 1520. Further, the first corner 1540 is formed at the intersection between the first midstream flow segment 1520 and the first downstream flow segment 1530, and the mixture is also required to be diverted when flowing from the first midstream flow segment 1520 to the first downstream flow segment 1530. In this way, it is beneficial to further uniform mixing of the mixture and the deceleration of the mixture, improving the uniformity and stability of the mixture ejected from the first flame outlet 1531.

[00106] As illustrated in FIG. 13, in some embodiments, the first downstream flow segment 1530 is inclined away from the center of the burner 100 from the first midstream flow segment 1520. When the mixture is ejected from the first flame outlet 1531, the mixture is obliquely ejected away from the center of the burner 100. In this way, the flame ejecting range is larger, making it more beneficial to heating for a large-sized cooker. For example, the first upstream flow segment 1510 extends transversely, the first midstream flow segment 1520 extends upwardly from the first upstream flow segment 1510, and the first downstream flow segment 1530 extends away from the center of the burner 100 from the first midstream flow segment 1520. After entering the first mixture outlet channel 1500, the mixture is required to be diverted twice, and then is ejected from the first flame outlet 1531 along the first downstream flow segment 1530.

[00107] As illustrated in FIG. 10 to FIG. 14, in some embodiments, the burner 100 includes a second mixture outlet channel 1600. A tip end of the second mixture outlet channel 1600 is formed as a second flame outlet 1621. Further, the second mixture outlet channel 1600 has at least one second corner 1630. The second corner 1630 is located upstream of the second flame outlet 1621. The mixture delivered along the second mixture outlet channel 1600 is required to flow through the second corner 1630 before being ejected from the second flame outlet 1621. The arrangement

of the second corner 1630 is beneficial to the further uniform mixing and the deceleration of the mixture. As a result, uniformity and stability of the mixture ejected from the second flame outlet 1621 is improved.

[00108] In another exemplary embodiment of the invention, the second mixture outlet channel 1600 includes a second upstream flow segment 1610 and a second downstream flow segment 1620. The second corner 1630 is formed at an intersection between the second upstream flow segment 1610 and the second downstream flow segment 1620. The second downstream flow segment 1620 has a tip end formed as the second flame outlet 1621.

[00109] In an exemplary embodiment of the invention, the mixture entering the interior of the burner 100 flows along the second mixture outlet channel 1600 and is finally discharged from the second flame outlet 1621. The second upstream flow segment 1610 is located upstream of the second downstream flow segment 1620. The mixture flows through the second upstream flow segment 1610 and the second downstream flow segment 1620 sequentially, and is finally discharged from the second flame outlet 1621. In this embodiment, the second corner 1630 is formed at the intersection between the second upstream flow segment 1610 and the second downstream flow segment 1620. When the mixture flows from the second upstream flow segment 1610 to the second downstream flow segment 1620, the mixture is required to be diverted. In this way, it is beneficial to the further uniform mixing of the mixture and the deceleration of the mixture, improving the uniformity and stability of the mixture ejected from the second flame outlet 1621.

[00110] As illustrated in FIG. 13, in some embodiments, the second downstream flow segment 1620 is inclined away from the center of the burner 100 from the second upstream flow segment 1610. When the mixture is ejected from the second flame outlet 1621, the mixture is obliquely ejected away from the center of the burner 100. In this way, the flame ejecting range is larger, making it more beneficial to the heating for the large-sized cooker. For example, the second upstream flow segment 1610 extends vertically, and the second downstream flow segment 1620 extends away from the center of the burner 100 from the second upstream flow segment 1610. After entering the second mixture outlet channel 1600, the mixture is required to be diverted once, and then is ejected from the second flame outlet 1621 along the second downstream flow segment 1620.

[00111] As illustrated in FIG. 1 to FIG. 4, in some embodiments, the first flame outlet 1531 is of an annular slit shape. The first flame outlet 1531 of the annular slit shape can realize heating for the cooker in a wide range. In addition, the annular slit shape also means that the first flame outlet 1531 is continuous in a circumferential direction of the burner 100. The circumferential direction may refer to a direction around the center of the burner 100. When the first flame outlet 1531 is used for ejecting of the blown air and the gas, the excess oxygen in the mixture of the blown air and the gas ejected from the first flame outlet 1531 may increase its contact with the gas ejected from the second flame outlet 1621, improving an oxygen supplement effect on the mixture ejected from the second flame outlet 1621. In addition to the above situation, it is also possible that, in some embodiments, the burner 100 includes a plurality of first flame outlets 1531, i.e., two or more first flame outlets 1531. That is, at least two first flame outlets 1531 are provided. The plurality of first flame outlets 1531 are arranged at intervals in a ring shape. For example, the plurality of first flame outlets 1531 are arranged at intervals in a ring shape in the circumferential direction of the burner 100. The mixture is ejected from the plurality of first flame outlets 1531 to generate the flame. In this way, the heating for the cooker in a wide range can also be realized.

[00112] With continued reference to FIG. 1 to FIG. 4, in some embodiments, the second flame outlet 1621 is of an annular slit shape. The second flame outlet 1621 of the annular slit shape can

realize the heating for the cooker in a wide range. In addition, the second flame outlet 1621 of the annular slit shape is continuous in the circumferential direction of the burner 100. When the second flame outlet 1621 is used for ejecting of the blown air and the gas, the excess oxygen in the mixture of the blown air and the gas ejected from the second flame outlet 1621 may increase its contact with the gas ejected from the first flame outlet 1531, improving an oxygen supplement effect on the mixture ejected from the first flame outlet 1531. In addition to the above situation, it is also possible that, in some embodiments, the burner 100 includes a plurality of second flame outlets 1621, i.e., two or more second flame outlets 1621. That is, at least two second flame outlets 1621 are provided. The plurality of second flame outlets 1621 are arranged at intervals in a ring shape. For example, the plurality of second flame outlets 1621 are arranged at intervals in a ring shape in the circumferential direction of the burner 100. The circumferential direction may refer to the direction around the center of the burner 100. The mixture is ejected from the plurality of second flame outlets 1621 to generate the flame. In this way, the heating for the cooker in a wide range can also be realized.

[00113] Since the first flame outlet 1531 is located more outward, when the first flame outlet 1531 is of the annular slit shape, the first flame outlet 1531 surrounds the second flame outlet 1621 (in this case, the plurality of second flame outlets 1621 may be provided or the second flame outlet 1621 may be of the annular slit shape). When the plurality of first flame outlets 1531 are provided, the plurality of first flame outlets 1531 surround the second flame outlet 1621 (in this case, a plurality of second flame outlets 1621 may be provided or the second flame outlet 1621 may be of the annular slit shape). For example, the first flame outlet 1531 illustrated in FIG. 1 is of the annular slit shape and surrounds the second flame outlet 1621 of the annular slit shape.

[00114] As illustrated in FIG. 8 to FIG. 11, in some embodiments, the burner 100 includes a stove 2000 and a flame cover 1000. The stove 2000 has a first receiving cavity 2410 and a second receiving cavity 2420. The flame cover 1000 is disposed at the stove 2000 to cover the first receiving cavity 2410 and the second receiving cavity 2420. The flame cover 1000 has a first flame outlet 1531 and a second flame outlet 1621. The first flame outlet 1531 is in communication with the first receiving cavity 2410. The second flame outlet 1621 is in communication with the second receiving cavity 2420.

[00115] In an exemplary embodiment of the invention, the stove 2000 may be integrally formed, or formed by assembling from separate components. The first receiving cavity 2410 surrounds the second receiving cavity 2420. The first flame outlet 1531 is in communication with the first receiving cavity 2410. The second flame outlet 1621 is in communication with the second receiving cavity 2420.

[00116] When the first flame outlet 1531 is used for ejecting of the blown air and the gas and the second flame outlet 1621 is used for ejecting of the induced air and the gas, the blown air and the gas are introduced into the first receiving cavity 2410, and mixed and ejected from the first flame outlet 1531 to be ignited to generate the flame, and the induced air and the gas are introduced into the second receiving cavity 2420, and mixed and ejected from the second flame outlet 1621 to be ignited to generate the flame.

[00117] When the first flame outlet 1531 is used for ejecting of the induced air and the gas and the second flame outlet 1621 is used for ejecting of the blown air and the gas, the induced air and the gas are introduced into the first receiving cavity 2410, and mixed and ejected from the first flame outlet 1531 to be ignited to generate the flame, and the blown air and the gas are introduced into the second receiving cavity 2420, and mixed and ejected from the second flame outlet 1621 to be ignited to generate the flame.

[00118] With continued reference to FIG. 8 to FIG. 11, in some embodiments, the flame cover 1000 includes a first flame cover 1110, a second flame cover 1120, and a third flame cover 1130. The first flame cover 1110 surrounds the second flame cover 1120. The second flame cover 1120 surrounds the third flame cover 1130. The first flame outlet 1531 is formed between the first flame cover 1110 and the second flame cover 1120. The second flame outlet 1621 is formed between the second flame cover 1120 and the third flame cover 1130. In this way, the first flame outlet 1531 is located farther from the center of the burner 100 than the second flame outlet 1621. As a result, the first flame outlet 1531 and the second flame outlet 1621 are located on a same wall. In this way, the first flame outlet 1531 and the second flame outlet 1621 are located adjacent to each other, making it easier to realize the flame stabilization for one of the first flame outlet 1531 and the second flame outlet 1621 through the other one of the first flame outlet 1531 and the second flame outlet 1621, further improving the flame stabilization effect.

[00119] Further, as illustrated in FIG. 8 to FIG. 13, in some embodiments, a first mixture outlet channel 1500 is formed between the first flame cover 1110 and the second flame cover 1120, and a second mixture outlet channel 1600 is formed between the second flame cover 1120 and the third flame cover 1130. Since the first flame cover 1110 surrounds the second flame cover 1120 and the second flame cover 1120 surrounds the third flame cover 1130, the first flame cover 1110 and the second flame cover 1120 may be designed to be spaced apart from each other, i.e., without being in contact with each other, and the second flame cover 1120 and the third flame cover 1130 may be designed to be spaced apart from each other, i.e., without being in contact with each other. In this way, the first mixture outlet channel 1500 is formed into a continuous annular space, and the second mixture outlet channel 1600 is also formed into a continuous annular space. Therefore, assembling of the flame cover 1000 is facilitated, and detailed description thereof will be described below.

[00120] As illustrated in FIG. 8 to FIG. 11, in some embodiments, the stove 2000 has a first annular wall 2100, a second annular wall 2200, and a third annular wall 2300. The first annular wall 2100 surrounds the second annular wall 2200. The second annular wall 2200 surrounds the third annular wall 2300. The first receiving cavity 2410 is formed between the first annular wall 2100 and the second annular wall 2200. The second receiving cavity 2420 is formed between the second annular wall 2200 and the third annular wall 2300. The first flame cover 1110 is of a ring shape. The second flame cover 1120 is of a ring shape. The third flame cover 1130 is of a ring shape. The first flame cover 1110 is placed on the first annular wall 2100 to be supported on the first annular wall 2100 under a gravity effect. The second flame cover 1120 is placed on the second annular wall 2200 to be supported on the second annular wall 2200 under the gravity effect. The third flame cover 1130 is placed on the third annular wall 2300 to be supported on the third annular wall 2300 under the gravity effect. This arrangement facilitates assembling of the flame cover 1000 with the stove 2000.

[00121] As illustrated in conjunction with FIG. 1 to FIG. 7, in some embodiments, the burner 100 includes a first induction tube 3100 and a second induction tube 3200. The first induction tube 3100 is connected to the stove 2000 and thus is in communication with the first receiving cavity 2410. The second induction tube 3200 is connected to the stove 2000 and thus is in communication with the second receiving cavity 2420. One of a mixture intaking end 3110 of the first induction tube 3100 and a mixture intaking end 3210 of the second induction tube 3200 is adapted to engage with the nozzle and receive the blown air, and the other one of the mixture intaking end 3110 of the first induction tube 3100 and the mixture intaking end 3210 of the second induction tube 3200 is adapted to engage with the nozzle.

[00122] In an exemplary embodiment of the invention, each of the first induction tube 3100 and the second induction tube 3200 has a Venturi structure.

[00123] As illustrated in FIG. 1 to FIG. 5, when the mixture intaking end 3110 of the first induction tube 3100 is engaged with the nozzle and receives the blown air and the mixture intaking end 3210 of the second induction tube 3200 is engaged with the nozzle, the nozzle is aligned with the mixture intaking end 3110 of the first induction tube 3100 and ejects the gas. Meanwhile, the blown air enters through the mixture intaking end 3110 of the first induction tube 3100, for example, by a forced blowing of the fan 4000. The blown air and the gas are delivered to the first receiving cavity 2410, and are mixed and finally ejected from the first flame outlet 1531. It can be understood that the fan 4000 may be fixedly connected to the first induction tube 3100, which is more convenient for the fan 4000 to cooperate with the mixture intaking end 3110 of the first induction tube 3100. The mixture intaking end 3210 of the second induction tube 3200 is engaged with the nozzle. That is, the nozzle is aligned with the mixture intaking end 3210 of the second induction tube 3200 and ejects the gas. Meanwhile, the negative pressure is formed in the surrounding environment to induce the air, and the induced air and the gas are delivered to the second receiving cavity 2420, and are mixed and finally ejected from the second flame outlet 1621.

[00124] As illustrated in FIG. 6 and FIG. 7, when the mixture intaking end of the second induction tube is engaged with the nozzle and receives the blown air and the mixture intaking end 3110 of the first induction tube 3100 is engaged with the nozzle, the nozzle is aligned with the mixture intaking end 3110 of the first induction tube 3100 and ejects the gas. Meanwhile, the negative pressure is formed in the surrounding environment to induce the air, and the induced air and the gas are delivered to the first receiving cavity 2410, and are mixed and finally ejected from the first flame outlet 1531. In addition, the nozzle is aligned with the mixture intaking end 3210 of the second induction tube 3200 and ejects the gas. Meanwhile, the blown air enters through the mixture intaking end 3210 of the second induction tube 3200, for example, by the forced blowing of the fan 4000. The blown air and the gas are delivered to the second receiving cavity 2420, and are mixed and finally ejected from the second flame outlet 1621. It can be understood that the fan 4000 may be fixedly connected to the second induction tube 3200, which is more convenient for the fan 4000 to cooperate with the mixture intaking end 3210 of the second induction tube 3200.

[00125] In some embodiments, in combination with FIG. 15 to FIG. 18, the burner 100 includes a first flame outlet 1531, a second flame outlet 1621, and a third flame outlet 1430. The first flame outlet 1531 is used for ejecting of the induced air and the gas. The second flame outlet 1621 is used for ejecting of the blown air and the gas. The third flame outlet 1430 is used for ejecting of the induced air and the gas. Moreover, the second flame outlet 1621 is located closer to the center of the burner 100 than the first flame outlet 1410, and the third flame outlet 1430 is located closer to the center of the burner 100 than the second flame outlet 1621.

[00126] The second flame outlet 1621 is used for ejecting of the blown air and the gas. The blown air can provide sufficient oxygen to allow for full combustion of the gas ejected from the second flame outlet 1621. The first flame outlet 1531 is used for ejecting of the induced air and the gas. The third flame outlet 1430 is used for ejecting of the induced air and the gas. The second flame outlet 1621 is formed between the first flame outlet 1531 and the third flame outlet 1430. Secondary air required for the flame generated at the first flame outlet 1531 can be provided by excess oxygen generated from the blown air, and secondary air required for the flame generated at the third flame outlet 1430 can also be provided by the excess oxygen generated from the blown air. With this arrangement, the gas ejected from the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430 can be fully burned, resulting in the high combustion

efficiency and contributing to the improvement of the thermal efficiency of the gas cooker.

[00127] As illustrated in FIG. 18, in some embodiments, the first flame outlet 1531 and the second flame outlet 1621 are disposed at a same wall, and a thickness of a wall between the first flame outlet 1531 and the second flame outlet 1621 is smaller than or equal to 6 mm. For example, the thickness of the wall between the first flame outlet 1531 and the second flame outlet 1621 is 0.2 mm, 0.5 mm, 1 mm, 2 mm, 3 mm, 4 mm, 5 mm, or 6 mm. With this arrangement, the first flame outlet 1531 and the second flame outlet 1621 are located close to each other as much as possible, which further improves the flame stabilization effect of the flame generated at the first flame outlet 1531 on the second flame outlet 1621.

[00128] As illustrated in FIG. 15 to FIG. 20, in some embodiments, the burner 100 includes a stove 2000 and a flame cover 1000. The flame cover 1000 is disposed at the stove 2000 to define a predetermined internal space together with the stove 2000. The flame cover 1000 has a first flame outlet 1531, a second flame outlet 1621, and a third flame outlet 1430 formed on the flame cover 1000. The first flame outlet 1531 is in communication with the internal space. The second flame outlet 1621 is in communication with the internal space. The third flame outlet 1430 is in communication with the internal space.

[00129] For example, the stove 2000 has a first receiving cavity 2410, a second receiving cavity 2420, and a third receiving cavity 2430. When the flame cover 1000 is disposed at the stove 2000, each of the first receiving cavity 2410, the second receiving cavity 2420, and the third receiving cavity 2430 are defined by the flame cover 1000. The first flame outlet 1531 is in communication with the first receiving cavity 2410. The induced air and the gas enter the first receiving cavity 2410, and are ejected through the first flame outlet 1531. The second flame outlet 1621 is in communication with the second receiving cavity 2420. The blown air and the gas enter the third receiving cavity 2430, and are ejected through the second flame outlet 1621. The third flame outlet 1430 is in communication with the third receiving cavity 2430. The induced air and the gas enter the third receiving cavity 2430, and are ejected through the third flame outlet 1430.

[00130] As illustrated in FIG. 19 and FIG. 20, in some embodiments, the burner 100 further includes a first induction tube 3100, a second induction tube 3200, and a third induction tube 3300. The first induction tube 3100 is in communication with the first receiving cavity 2410, and is used for receiving the induced air and the gas. The second induction tube 3200 is in communication with the second receiving cavity 2420, and is used for receiving the blown air and the gas. The third induction tube 3300 is in communication with the third receiving cavity 2430, and is used for receiving the induced air and the gas.

[00131] In an exemplary embodiment of the invention, the first induction tube 3100 has a Venturi structure. Further, the first induction tube 3100 is connected to the stove 2000 to bring the first induction tube 3100 to be in communication with the first receiving cavity 2410. The first induction tube 3100 has a mixture intaking end 3110 engaged with the nozzle. The nozzle is aligned with the mixture intaking end 3110 of the first induction tube 3100 to eject the gas. Meanwhile, a negative pressure is formed on the surrounding environment to induce the air. The induced air and the gas are delivered to the first receiving cavity 2410 to be mixed, and are finally ejected from the first flame outlet 1531.

[00132] The second induction tube 3200 has a Venturi structure. The second induction tube 3200 is connected to the stove 2000 to bring the second induction tube 3200 to be in communication with the second receiving cavity 2420. The second induction tube 3200 has a mixture intaking end 3210 engaged with the nozzle. The nozzle is aligned with the mixture intaking end 3210 of the second induction tube 3200 to eject the gas. Meanwhile, the blown air

enters through the mixture intaking end 3210 of the second induction tube 3200, for example, by forced blowing of a fan 4000. The blown air and the gas are delivered to the second receiving cavity 2420 to be mixed, and are finally ejected from the second flame outlet 1621. The fan 4000 may be connected and fixed to the second induction tube 3200 to more facilitate the cooperation of fan 4000 and the mixture intaking end 3210 of the second induction tube 3200.

[00133] The third induction tube 3300 has a Venturi structure. The third induction tube 3300 is connected to the stove 2000. In this way, the third induction tube 3300 is in communication with the third receiving cavity 2430. The mixture intaking end 3310 of the third induction tube 3300 is engaged with the nozzle. The nozzle is aligned with the mixture intaking end 3310 of the third induction tube 3300 to eject the gas. Meanwhile, the negative pressure is formed on the surrounding environment to induce the air. The induced air and the gas are delivered to the third receiving cavity 2430 to be mixed, and are finally ejected from the third flame outlet 1430.

[00134] The gas is supplied through the first induction tube 3100, the second induction tube 3200, and the third induction tube 3300. When being at a minimum intensity, the flame may be formed only at the third flame outlet 1430.

[00135] As illustrated in FIG. 17 and FIG. 18, in some embodiments, the flame cover 1000 includes an outer flame cover 1100, an inner flame cover 1200, and a middle flame cover 1300. The outer flame cover 1100 has a first flame outlet 1531 and a second flame outlet 1621. The inner flame cover 1200 has a third flame outlet 1430. The outer flame cover 1100 surrounds the inner flame cover 1200. The middle flame cover 1300 shields a space between the outer flame cover 1100 and the inner flame cover 1200.

[00136] As illustrated in FIG. 18, in some embodiments, the inner flame cover 1200 is connected and fixed to the middle flame cover 130. In this way, the inner flame cover 1200 and the middle flame cover 1300 are constructed as an independent device and may be disassembled and assembled synchronously. For example, the middle flame cover 1300 includes a first cover 1310 and a second cover 1320. The first cover 1310 extends vertically and surrounds the inner flame cover 1200. The first cover 1310 and the inner flame cover 1200 are connected and fixed to each other. The second cover 1320 is disposed at a top of the first cover 1310 and extends towards the outer flame cover 1100 to block the space between the outer flame cover 1100 and the inner flame cover 1200.

[00137] As illustrated in FIG. 15 to FIG. 17, in some embodiments, the inner flame cover 1200 is disposed at the center of the burner 100. That is, a flame generated at the inner flame cover 1200 is located within a center of the flame ejecting range. In this way, it is more beneficial for the gas cooker to be in a minimum-flame cooking state. For example, the inner flame cover 1200 covers the center of the burner 100.

[00138] Further, the inner flame cover 1200 is a porous ceramic plate, and such porous structure allows the inner flame cover 1200 to have a plurality of third flame outlets 1430. By designing the inner flame cover 1200 as the porous ceramic plate, the inner flame cover 1200 can generate infrared combustion, i.e., the inner flame cover 1200 is formed as an infrared combustion flame cover, which is beneficial to realization of minimum-flame combustion. In addition, a flame hole thermal intensity of the inner flame cover 1200 is small, which can realize full premixed combustion and reduce the demand for the secondary air even without supplementing of the secondary air (i.e. without entrainment of the surrounding air or excess oxygen ejected from the second flame outlet 1621). For example, the porous ceramic plate is mainly made of infrared ceramic materials.

[00139] As illustrated in FIG. 15 to FIG. 17, in some embodiments, a top surface of the middle

flame cover 1300 is designed to be planar. Since the middle flame cover 1300 shields the space between the outer flame cover 1100 and the inner flame cover 1200, when the top surface of the middle flame cover 1300 is planar, the integrity of the flame cover 1000 is further improved, making the flame cover 1000 easier to be cleaned. In particular, when the top surface of the middle flame cover 1300 is formed as the top surface of the flame cover 1000, user's wiping action is smoother and less obstructed when cleaning the top surface of the flame cover 1000. For example, the top surface of the middle flame cover 1300 shown in FIG. 15 is a horizontal plane.

[00140] Further, as illustrated in FIG. 17 and FIG. 18, the middle flame cover 1300 is adapted to be abutted against an inner wall of the outer flame cover 1100 in a radial direction of the burner 100. In general, the middle flame cover 1300 is supported by the stove 2000 in a gravity direction, and is abutted against the inner wall of the outer flame cover 1100 in the radial direction of the burner 100. In this way, the middle flame cover 1300 is restricted in two directions and is more stable. It can be understood that when the gas cooker is in a use environment, an up-down direction is an axial direction, the gravity direction is from top to bottom in the axial direction, and the radial direction is perpendicular to the axial direction.

[00141] As illustrated in FIG. 15 to FIG. 18, in some embodiments, the outer flame cover 1100 includes a first flame cover 1110, a second flame cover 1120, and a third flame cover 1130. The first flame cover 1110 surrounds the second flame cover 1120, and the first flame outlet 1531 is formed between the first flame cover 1110 and the second flame cover 1120. The second flame cover 1120 surrounds the third flame cover 1130, and the second flame outlet 1621 is formed between the second flame cover 1120 and the third flame cover 1130. The middle flame cover 1300 is disposed between the third flame cover 1130 and the inner flame cover 1200 to shield the space between the outer flame cover 1100 and the inner flame cover 1200. In this way, the first flame outlet 1531, the second flame outlet 1621, and the third flame cover 1430 are arranged sequentially from the outside to the inside.

[00142] It can be understood that the middle flame cover 1300 and the outer flame cover 1100 may be separate components, or may be at least partially formed integrally. The middle flame cover 1300 and the inner flame cover 1200 may be separate components, or may be at least partially formed integrally. For example, as illustrated in FIG. 15 to FIG. 18, the middle flame cover 1300, the outer flame cover 1100, and the inner flame cover 1200 are separate components and are engaged with each other through assembling. As illustrated in FIG. 28 to FIG. 30, the middle flame cover 1300 and the third flame cover 1130 are integrally formed. That is, both the middle flame cover 1300 and the third flame cover 1130 are included in one component. In addition, the middle flame cover 1300 and the inner flame cover 1200 are separate components.

[00143] In some embodiments, a plurality of first flame outlets 1531 are provided, which means two or more first flame outlets 1531 are provided. That is, at least two first flame outlets 1531 are provided. The plurality of first flame outlets 1531 are arranged at intervals in a ring shape. For example, the plurality of first flame outlets 1531 are arranged at intervals in a ring shape in a circumferential direction of the burner 100. The circumferential direction may be understood as a direction around the center of the burner 100. The plurality of first flame outlets 1621 can eject the mixture to generate flames, which can realize the heating for the cooker in a wide range. In addition to the above situation, it is also possible that, as illustrated in FIG. 17 and FIG. 18, in some embodiments, the first flame outlet 1531 is of an annular slit shape, and the first flame outlet 1531 of the annular slit shape may also realize the heating of the cooker in a wide range.

[00144] In some embodiments, a plurality of second flame outlets 1621 are provided, which means two or more second flame outlets 1621. That is, at least two second flame outlets 1621 are

provided. The plurality of second flame outlets 1621 are arranged at intervals in a ring shape. For example, the plurality of second flame outlets 1621 are arranged at intervals in a ring shape in the circumferential direction of the burner 100. The circumferential direction may be understood as the direction around the center of the burner 100. The plurality of second flame outlets 1621 can eject the mixture to generate flames, which can realize the heating of the cooker in a wide range. In addition to the above situation, it is also possible that, as illustrated in FIG. 17 and FIG. 18, in some embodiments, the second flame outlet 1621 is of an annular slit shape. The second flame outlet 1621 of the annular slit shape may realize the heating of the cooker in a wide range. In addition, when being designed into the annular slit shape, the second flame outlet 1621 is continuous in the circumferential direction of the burner 100, allowing the excess oxygen in the mixture ejected from the second flame outlet 1621 to increase its contact with the gas ejected from the first flame outlet 1531 or the third flame outlet 1430, further improving an oxygen supplement effect.

[00145] As illustrated in FIG. 17 and FIG. 18, in some embodiments, a plurality of third flame outlets 1430 are provided, which means two or more third flame outlets 1430. That is, at least two third flame outlets 1430 are provided. The plurality of third flame outlets 1430 are arranged at intervals in a ring shape or arranged densely in a ring shape. In addition to the above situation, it is also possible that, in some embodiments, the third flame outlet 1430 is of an annular slit shape.

[00146] Since the first flame outlet 1531 is located further from the center of the burner 100 than the second flame outlets 1621, when the plurality of first flame outlets 1531 are provided and arranged in the ring shape, the plurality of first flame outlets 1531 surround the second flame outlet 1621 (the plurality of second flame outlets 1621 may be provided or the second flame outlet 1621 may be of an annular slit shape). When the first flame outlet 1531 is of the annular slit shape, the first flame outlet 1531 of the annular slit shape surrounds the second flame outlet 1621 (the plurality of second flame outlets 1621 may be provided or the second flame outlet 1621 may be of an annular slit shape). Since the second flame outlet 1621 is located further from the center of the burner 100 than the third flame outlet 1430, when the plurality of second flame outlets 1621 are provided and arranged in the ring shape, the plurality of second flame outlets 1621 surround the third flame outlet 1430 (the plurality of third flame outlets 1430 may be provided or the third flame outlet 1430 may be of an annular slit shape). When the second flame outlet 1621 is of an annular slit shape, the second flame outlet 1621 of the annular slit shape surrounds the third flame outlet 1430 (the plurality of third flame outlets 1430 may be provided or the third flame outlet 1430 may be of an annular slit shape).

[00147] The embodiments of the invention also disclose a gas cooker. As illustrated in FIG. 1 to FIG. 30, the gas cooker includes the above-described burner 100. The burner 100 includes a first flame outlet 1531 and a second flame outlet 1621. The first flame outlet 1531 is located farther from a center of the burner than the second flame outlet 1621. Moreover, one of the first flame outlet 1531 and the second flame outlet 1621 is used for ejecting of blown air and a gas, and another one of the first flame outlet 1531 and the second flame outlet 1621 is used for ejecting of induced air and the gas. In the technical solution, one of the first flame outlet 1531 and the second flame outlet 1621 can be used for ejecting of the gas and the blown air. The blown air provides sufficient oxygen to allow for full combustion of the gas ejected from the one of the first flame outlet 1531 and the second flame outlet 1621. In addition, the blown air can generate excess oxygen to assist in combustion of the gas ejected from the other one of the first flame outlet 1531 and the second flame outlet 1621. In this way, the gas ejected from the other one of the first flame outlet 1621 and the second flame outlet 1621 can be fully burned under the effects of the induced

air and the excess oxygen provided by the blown air. Such an arrangement finally allows the gas ejected from the first flame outlet 1621 and the second flame outlet 1621 to be fully burned with high combustion efficiency, which is beneficial to improvement of thermal efficiency of the gas cooker.

5 **[00148]** Optionally, when gas supply to the second flame outlet 1621 is interrupted by a valve, the valve maintains gas supply to the first flame outlet 1531 and/or a third flame outlet 1430, and a fan 4000 of the gas cooker is in an operation state to provide the blown air. In the technical invention, secondary air required for the flame generated at the first flame outlet 1531 can be provided by excess oxygen generated from the blown air, and secondary air required for the flame
10 generated at the third flame outlet 1430 can also be provided by the excess oxygen generated from the blown air. With this arrangement, the gas ejected from the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430 can be fully burned, resulting in the high combustion efficiency and contributing to the improvement of the thermal efficiency of the gas cooker.

15 **[00149]** In some embodiments, the gas cooker includes a valve (not shown) for adjusting a gas flow rate. The valve may maintain gas supply to one of the first flame outlet 1531 and the second flame outlet 1621 when gas supply to the other one of the first flame outlet 1531 and the second flame outlet 1621 is interrupted by the valve, and at this time, the fan 4000 of the gas cooker is still in the operation state.

20 **[00150]** In an exemplary embodiment of the invention, the following description will be set forth by the example where the first flame outlet 1531 is the one of the first flame outlet 1531 and the second flame outlet 1621 for ejecting of the blown air and the gas, and the second flame outlet 1621 is the other one of the first flame outlet 1531 and the second flame outlet 1621 for ejecting of the induced air and the gas. The valve is a device for adjusting the gas flow rate, and has an inlet
25 connected to the gas pipeline and an outlet connected to the nozzle. Flow rates of the gas finally delivered to the first flame outlet 1531 and the second flame outlet 1621 are adjusted by an adjustment of the valve. A specific structure of the valve may refer to the related art, and details thereof are omitted herein. When the valve is adjusted until the gas supply to the first flame outlet 1531 is interrupted, the gas supply to the second flame outlet 1621 may still be maintained, and at
30 this time, the fan 4000 is still in the operation state. In this way, the air (the blown air) forcibly delivered by the fan 4000 is ejected through the first flame outlet 1531 to be supplemented to the mixture ejected from the second flame outlet 1621. In this way, it can be ensured that the gas ejected from the second flame outlet 1621 can be sufficiently burned even when the gas is not ejected through the first flame outlet 1531.

35 **[00151]** It can be understood that the fan 4000 may be started synchronously when the gas cooker is ignited. No matter how the valve is adjusted, the fan 4000 still maintains its operation state and is closed until the gas cooker is shut down. In other embodiments of the invention, other control logic may also be employed, and details thereof are omitted herein.

[00152] Embodiments of the invention also disclose an integrated electrical appliance. The
40 integrated electrical appliance includes the gas cooker according to the above embodiments. The so-called integrated electrical appliance is a device that integrates functions of the gas cooker and another traditional electrical appliance. For example, at least one of a microwave oven, an oven, a steamer, and a hood may be integrated with the gas cooker to form the integrated electrical appliance. In other embodiments of the invention, the integrated electrical appliance is not limited
45 to the electrical appliances as described above, and any combination, which integrates with the gas cooker and may provide more functions than a separate gas cooker, may be considered as the

integrated electrical appliance. It can be understood that since the gas cooker of the integrated electrical appliance of this embodiment adopts the technical solutions of the embodiments as described above, the gas cooker at least has the beneficial effects brought by the technical solutions of the embodiments as described above, and details thereof are omitted herein.

5 **[00153]** In addition, a combustion of a burner of a gas cooker requires secondary air supplement with insufficient primary air. Generally, the secondary air is supplemented to the flame through buoyancy and entrainment effects from the surrounding environment. This method places high demands on sizes of the components. Therefore, there is improvement room for thermal efficiency of the gas cooker.

10 **[00154]** A second aspect of the invention discloses a burner 100. As illustrated in FIG. 15 to FIG. 18, in some embodiments, the burner 100 includes a first flame outlet 1410, a second flame outlet 1621, and a third flame outlet 1430. The first flame outlet 1531 is used for ejecting of induced air and a gas. The second flame outlet 1621 is used for ejecting of blown air and the gas. The third flame outlet 1430 is used for ejecting of the induced air and the gas. In addition, the
15 the second flame outlet 1621 is located closer to a center of the burner 100 than the first flame outlet 1410, and the third flame outlet 1430 is located closer to the center of the burner 100 than the second flame outlet 1621.

[00155] The second flame outlet 1621 is used for ejecting of the blown air and the gas. The blown air can provide sufficient oxygen to allow for full combustion of the gas ejected from the
20 the second flame outlet 1621. The first flame outlet 1531 is used for ejecting of the induced air and the gas. The third flame outlet 1430 is used for ejecting of the induced air and the gas. The second flame outlet 1621 is formed between the first flame outlet 1531 and the third flame outlet 1430. Secondary air required for a flame generated at the first flame outlet 1531 can be provided by excess oxygen generated from the blown air, and secondary air required for a flame generated at
25 the third flame outlet 1430 can also be provided by the excess oxygen generated from the blown air. With this arrangement, the gas ejected from the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430 can be fully burned, resulting in the high combustion efficiency and contributing to improvement of the thermal efficiency of the gas cooker.

[00156] In an exemplary embodiment of the invention, the second flame outlet 1621 is located
30 closer to the center of the burner 100 than the first flame outlet 1531, and the third flame outlet 1430 is located closer to the center of the burner 100 than the second flame outlet 1621. The center of the burner 100 refers to a center of a flame ejecting range of the burner 100. That is, when the burner 100 is observed from top to bottom, the first flame outlet 1531 is located more outward than the second flame outlet 1621 and the third flame outlet 1430, the third flame outlet 1430 is
35 located more inward than the first flame outlet 1531 and the second flame outlet 1621, and the second flame outlet 1621 is located between the first flame outlet 1531 and the third flame outlet 1430. In this way, the third flame outlet 1430, the second flame outlet 1621, and the first flame outlet 1531 are sequentially arranged away from the center of the burner 100. Further, a minimum distance between the first flame outlet 1531 and the center of the burner 100 is greater than a
40 minimum distance between the second flame outlet 1621 and the center of the burner 100, and the minimum distance between the second flame outlet 1621 and the center of the burner 100 is greater than a minimum distance between the third flame outlet 1430 and the center of the burner 100. In some cases, the third flame outlet 1430 may be located directly at the center of the burner 100, which is more beneficial to uniform temperature distribution.

45 **[00157]** The second flame outlet 1621 is used for ejecting of the blown air and the gas. Further, the blown air and the gas enter an interior of the burner 100, then are ejected from the interior of

the burner 100 through the second flame outlet 1621, and are ignited to generate the flame. The gas supply may come from a canned liquefied gas or a piped natural gas. In addition, the gas cooker includes a valve. After the valve is opened, the gas is delivered along gas pipelines. The gas flows through the valve and is ejected through a nozzle. The gas ejected from the nozzle is injected into the interior of the burner 100. During this process, the blown air is provided and generated by fluid machinery. For example, the blown air is provided by forced blowing of a fan 4000. The blown air enters the interior of the burner 100 and is mixed with the gas. In this case, the blown air is primary air. Subsequently, a mixture of the blown air and the gas is ejected from the second flame outlet 1621. Compared to the induced air, the blown air can provide more oxygen. In this way, the gas ejected from the second flame outlet 1621 can be in a rich-oxygen combustion state, allowing the gas ejected from the second flame outlet 1621 to be fully burned. In this case, the flame generated at the second flame outlet 1621 can still entrain secondary air from the surrounding environment for participating in the combustion.

[00158] The first flame outlet 1531 is used for ejecting of the induced air and the gas. Further, the induced air and the gas enter the interior of the burner 100, then are ejected from the interior of the burner 100 through the first flame outlet 1531, and are ignited to generate the flame. The gas supply may come from either the canned liquefied gas or the piped natural gas. In addition, the gas cooker includes a valve. After the valve is opened, the gas is delivered along the gas pipeline. The gas flows through the valve and is ejected through the nozzle. The gas ejected from the nozzle is injected into the interior of the burner 100. The air induction is realized simultaneously during the injecting of the gas into the interior of the burner 100. The air induction may be understood by referring to the related art, which is generally based on the Venturi principle. During the injection of the gas into the interior of the burner 100, a negative pressure is formed in a surrounding environment, causing surrounding air to be entrained into the interior of the burner along with the injection of the gas (such air entering the interior of the burner 100 through an entrainment action is called induced air, which is primary air). The induced air and the gas are ejected from the first flame outlet 1531 after being mixed in the interior of the burner 100, and then are ignited to generate a flame. When the induced air ejected from the first flame outlet 1531 is not enough to support the combustion of the gas ejected from the first flame outlet 1531, it is necessary to supplement the secondary air. Since the blown air can be ejected from the second flame outlet 1621, the blown air ejected from the second flame outlet 1621 can provide enough oxygen. In this way, in addition to participating in the combustion of the gas ejected from the second flame outlet 1621, the blown air ejected from the second flame outlet 1621 may provide additional oxygen to be supplemented to the mixture of the induced air and the gas ejected from the first flame outlet 1531 to assist in the combustion of the gas ejected from the first flame outlet 1531. Compared to supplementing the secondary air from the surrounding environment through the entrainment effect, the excess oxygen provided by the blown air ejected from the second flame outlet 1621 is more actively supplemented to the mixture of the blown air and the gas ejected from the first flame outlet 1531. In this way, the gas ejected from the first flame outlet 1531 is fully burned (in this case, the flame generated at the first flame outlet 1531 can still entrain the secondary air from the surrounding environment to participate in the combustion).

[00159] Similarly, the third flame outlet 1430 is used for ejecting of the induced air and the gas. The induced air and the gas enter the interior of the burner 100, then are ejected from the interior of the burner 100 through the third flame outlet 1430, and are ignited to form the flame. The gas supply may come from either the canned liquefied gas or the piped natural gas. In addition, the gas cooker includes a valve. After the valve is opened, the gas is delivered along the gas pipeline. The

gas flows through the valve and is ejected through the nozzle. The gas ejected from the nozzle is injected into the interior of the burner 100. The air induction is realized synchronously during the ejecting of the gas into the interior of the burner 100. The induced air and the gas enter the interior of the burner 100 to be mixed, then are ejected from the third flame outlet 1430, and are ignited to form the flame. When the induced air ejected from the third flame outlet 1430 is not enough to support the combustion of the gas ejected from the third flame outlet 1430, it is necessary to supplement the secondary air. Since the blown air can be ejected from the second flame outlet 1621, the blown air ejected from the second flame outlet 1621 can provide enough oxygen. In this way, in addition to participating in the combustion of the gas ejected from the second flame outlet 1621, the blown air ejected from the second flame outlet 1621 may provide additional oxygen to be supplemented to the mixture of the induced air and the gas ejected from the third flame outlet 1430 to assist in the combustion of the gas ejected from the third flame outlet 1430. Compared to supplementing the secondary air from the surrounding environment through the entrainment effect, the excess oxygen provided by the blown air ejected from the second flame outlet 1621 is more actively supplemented to the mixture of the blown air and the gas ejected from the first flame outlet 1531. In this way, the gas ejected from the first flame outlet 1531 is fully burned (in this case, the flame generated at the first flame outlet 1531 can still entrain the secondary air from the surrounding environment to participate in the combustion). Compared to supplementing the secondary air from the surrounding environment through the entrainment effect, the excess oxygen provided by the blown air ejected from the second flame outlet 1621 is more actively supplemented to the mixture of the blown air and the gas ejected from the third flame outlet 1430. In this way, the gas ejected from the third flame outlet 1430 is fully burned (in this case, the flame generated at the third flame outlet 1430 can still entrain the secondary air from the surrounding environment to participate in the combustion).

[00160] According to the above solution, the gas ejected from the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430 are fully burned with the high combustion efficiency, which is beneficial to the improvement of the thermal efficiency of the gas cooker. It can be understood that the reference herein to sufficient combustion is relative to (i.e., relatively more sufficient) a combustion state achieved with only the induction of the air and the entrainment of the surrounding air.

[00161] In some embodiments, the flame generated at the first flame outlet 1531 is adapted to perform flame stabilization on the second flame outlet 1621. In an exemplary embodiment of the invention, the blown air and the gas are ejected from the second flame outlet 1621. The inventor finds that although the full combustion of the gas can be realized by the blown air, a flow rate of the mixture of the blown air and the gas ejected from the second flame outlet 1621 is relatively large through an effect of the blown air, and a speed at which the gas leaves from the second flame outlet 1621 is greater than a burning rate of the gas, easily causing a flame separation phenomenon. Since the induced air and the gas can be ejected from first flame outlet 1531, the induced air is obtained through natural induction by ejecting the gas through the nozzle without being generated based on the fluid machinery. A speed at which the gas leaves from the first flame outlet 1531 is not much different from the burning rate of the gas, which can realize stable combustion. That is, the flame formed at the first flame outlet 1531 is in a stable state. Since the flame formed at the first flame outlet 1531 is more stable, the flame generated at the first flame outlet 1531 can be used for performing flame stabilization on the second flame outlet 1621.

[00162] In other words, the flame formed at the first flame outlet 1531 can both realize heating for a cooker and serve as a flame stabilization hole/flame stabilization groove. In a word, since the

first flame outlet 1531 is used for ejecting of the induced air and the gas, the gas ejected from the first flame outlet 1531 has a more stable burning state. By adjusting a position, an angle, or a distance of the first flame outlet 1531 relative to the second flame outlet 1621, the flame formed at the first flame outlet 1531 can ignite the gas ejected from the second flame outlet 1621. For example, the flame formed at the first flame outlet 1531 can heat a root of the gas ejected from the second flame outlet 1621, to ignite the gas ejected from the second flame outlet 1621. When the gas leaves from the second flame outlet 1621 quickly, the gas can be ignited by the flame formed at the first flame outlet 1531, causing the gas quickly leaving from the second flame outlet 1621 to be burned at the second flame outlet 1621. In this way, occurrence of the flame separation phenomenon at the second flame outlet 1621 can be suppressed, providing a flame stabilization effect on the second flame outlet 1621, and thus further improving the combustion efficiency.

[00163] As illustrated in FIG. 18, in some embodiments, the first flame outlet 1531 and the second flame outlet 1621 are disposed at a same wall, and a thickness of a wall between the first flame outlet 1531 and the second flame outlet 1621 is smaller than or equal to 6 mm. For example, the thickness of the wall between the first flame outlet 1531 and the second flame outlet 1621 is 0.2 mm, 0.5 mm, 1 mm, 2 mm, 3 mm, 4 mm, 5 mm, or 6 mm. With this arrangement, the first flame outlet 1531 and the second flame outlet 1621 are located close to each other as much as possible, which further improves the flame stabilization effect of the flame generated at the first flame outlet 1531 on the second flame outlet 1621.

[00164] As illustrated in FIG. 21 to FIG. 24, in some embodiments, the burner 100 includes a first mixture outlet channel 1500. A tip end of the first mixture outlet channel 1500 is formed as the first flame outlet 1531. Further, the first mixture outlet channel 1500 has at least one first corner 1540. One of the at least one first corner 1540 is located upstream of the first flame outlet 1531. A mixture delivered along the first mixture outlet channel 1500 needs to flow through the first corner 1540 before being ejected from the first flame outlet 1531. The arrangement of the first corner 1540 is beneficial to further uniform mixing of the mixture and deceleration of the mixture, improving uniformity and stability of the mixture ejected from the first flame outlet 1531.

[00165] For example, the first mixture outlet channel 1500 includes a first upstream flow segment 1510, a first midstream flow segment 1520, and a first downstream flow segment 1530. One of the at least one first corner 1540 is formed at an intersection between the first upstream flow segment 1510 and the first midstream flow segment 1520. One of the at least one first corner 1540 is formed at an intersection between the first midstream flow segment 1520 and the first downstream flow segment 1530. The first downstream flow segment 1530 has a tip end formed as the first flame outlet 1531. In an exemplary embodiment of the invention, the mixture entering the interior of the burner 100 flows along the first mixture outlet channel 1500 and is finally discharged from the first flame outlet 1531. The first upstream flow segment 1510 is located upstream of the first midstream flow segment 1520. The first midstream flow segment 1520 is located upstream of the first downstream flow segment 1530. The mixture flows through the first upstream flow segment 1510, the first midstream flow segment 1520, and the first downstream flow segment 1530 sequentially, and is finally discharged from the first flame outlet 1531. In this embodiment, one of the at least one first corner 1540 is formed at the intersection between the first upstream flow segment 1510 and the first midstream flow segment 1520, and the mixture is required to be diverted when flowing from the first upstream flow segment 1510 to the first midstream flow segment 1520. Further, one of the at least one first corner 1540 is formed at the intersection between the first midstream flow segment 1520 and the first downstream flow segment 1530, and the mixture is also required to be diverted when flowing from the first midstream flow segment

1520 to the first downstream flow segment 1530. In this way, it is beneficial to further uniform mixing of the mixture and the deceleration of the mixture, improving the uniformity and stability of the mixture ejected from the first flame outlet 1531.

[00166] With Continued reference to FIG. 21 to FIG. 24, in some embodiments, the burner 100 includes a second mixture outlet channel 1600. The second mixture outlet channel 1600 has a tip end formed as the second flame outlet 1621. The second mixture outlet channel 1600 has at least one second corner 1630. One of the at least one second corner 1630 is located upstream of the second flame outlet 1621. The mixture delivered along the second mixture outlet channel 1600 needs to flow through the second corner 1630 before being ejected from the second flame outlet 1621. The arrangement of the second corner 1630 is beneficial to the further mixing and the deceleration of the mixture, improving uniformity and stability of the mixture ejected from the second flame outlet 1621.

[00167] For example, the second mixture outlet channel 1600 includes a second upstream flow segment 1610 and a second downstream flow segment 1620. The second corner 1630 is formed at an intersection between the second upstream flow segment 1610 and the second downstream flow segment 1620. The second downstream flow segment 1620 has a tip end formed as the second flame outlet 1621. In an exemplary embodiment of the invention, the mixture entering the interior of the burner 100 flows along the second mixture outlet channel 1600 and is finally discharged from the second flame outlet 1621. The second upstream flow segment 1610 is located upstream of the second downstream flow segment 1620. The mixture flows through the second upstream flow segment 1610 and the second downstream flow segment 1620 sequentially, and is finally discharged from the second flame outlet 1621. In this embodiment, the second corner 1630 is formed at the intersection between the second upstream flow segment 1610 and the second downstream flow segment 1620. The mixture is required to be diverted when flowing from the second upstream flow segment 1610 to the second downstream flow segment 1620. In this way, it is beneficial to further uniform mixing of the mixture and the deceleration of the mixture, improving the uniformity and stability of the mixture ejected from the second flame outlet 1621.

[00168] With continued reference to FIG. 21 to FIG. 24, in some embodiments, the first mixture outlet channel 1500 includes a first downstream flow segment 1530. The first downstream flow segment 1530 has a tip end formed as the first flame outlet 1531. The first downstream flow segment 1530 is inclined away from the center of the burner 100 from bottom to top, and an orientation herein is referred to the use environment where the gas cooker is mounted as a reference. A side of the gas cooker facing towards the ground is a down (bottom) side, and a side of the gas cooker away from the ground is an up (top) side. Such an arrangement of the first downstream flow segment 1530 allows the flame formed at the first flame outlet 1531 to realize heating for the cooker in a wide range. Similarly, the second mixture outlet channel 1600 includes a second downstream flow segment 1620. The second downstream flow segment 1620 has a tip end formed as the second flame outlet 1621. The second downstream flow segment 1620 is inclined away from the center of the burner 100 from bottom to top. In this way, the flame formed at the second flame outlet 1621 can realize the heating for the cooker in a wide range.

[00169] As illustrated in FIG. 25 to FIG. 27, in some embodiments, the first downstream flow segment 1530 of the first mixture outlet channel 1500 is inclined towards the center of the burner 100 from bottom to top, and the second downstream flow segment 1620 of the second mixture outlet channel 1600 is inclined towards the center of the burner 100 from bottom to top. Since the third flame outlet 1430 is located closer to the center of the burner 100 than the first flame outlet 1531 and the second flame outlet 1621, such an arrangement of the first downstream flow segment

1530 and the second downstream flow segment 1620 is more beneficial to flame transfer among the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430.

[00170] As illustrated in FIG. 15 to FIG. 20, in some embodiments, the burner 100 includes a stove 2000 and a flame cover 1000. The flame cover 1000 is disposed at the stove 2000 to define a predetermined internal space together with the stove 2000. The flame cover 1000 has a first flame outlet 1531, a second flame outlet 1621, and a third flame outlet 1430 formed on the flame cover 1000. The first flame outlet 1531 is in communication with the internal space. The second flame outlet 1621 is in communication with the internal space. The third flame outlet 1430 is in communication with the internal space.

[00171] For example, the stove 2000 has a first receiving cavity 2410, a second receiving cavity 2420, and a third receiving cavity 2430. When the flame cover 1000 is disposed at the stove 2000, each of the first receiving cavity 2410, the second receiving cavity 2420, and the third receiving cavity 2430 are defined by the flame cover 1000. The first flame outlet 1531 is in communication with the first receiving cavity 2410. The induced air and the gas enter the first receiving cavity 2410, and are ejected through the first flame outlet 1531. The second flame outlet 1621 is in communication with the second receiving cavity 2420. The blown air and the gas enter the third receiving cavity 2430, and are ejected through the second flame outlet 1621. The third flame outlet 1430 is in communication with the third receiving cavity 2430. The induced air and the gas enter the third receiving cavity 2430, and are ejected through the third flame outlet 1430.

[00172] It can be understood that since the first flame outlet 1531 and the third flame outlet 1430 are both used for ejecting of the induced air and the gas, the first receiving cavity 2410 and the third receiving cavity 2430 may be designed to be in communication with each other on the stove 2000. The induced air and the gas may enter the first receiving cavity 2410 and then enter the third receiving cavity 2430, and are finally ejected from the first flame outlet 1531 and the third flame outlet 1430. The induced air and the gas may also enter the third receiving cavity 2430 and then enter the first receiving cavity 2410, and are finally may be ejected from the first flame outlet 1531 and the third flame outlet 1430.

[00173] Since the tip end of the first mixture outlet channel 1500 is formed as the first flame outlet 1531 and the tip end of the second mixture outlet channel 1600 is formed as the second flame outlet 1621, the flame cover 1000 may have the first mixture outlet channel 1500 and the second mixture outlet channel 1600.

[00174] As illustrated in FIG. 19 and FIG. 20, in some embodiments, the burner 100 further includes a first induction tube 3100, a second induction tube 3200, and a third induction tube 3300. The first induction tube 3100 is in communication with the first receiving cavity 2410, and is used for receiving the induced air and the gas. The second induction tube 3200 is in communication with the second receiving cavity 2420, and is used for receiving the blown air and the gas. The third induction tube 3300 is in communication with the third receiving cavity 2430, and is used for receiving the induced air and the gas.

[00175] In an exemplary embodiment of the invention, the first induction tube 3100 has a Venturi structure. Further, the first induction tube 3100 is connected to the stove 2000 to bring the first induction tube 3100 to be in communication with the first receiving cavity 2410. The first induction tube 3100 has a mixture intaking end 3110 engaged with the nozzle. The nozzle is aligned with the mixture intaking end 3110 of the first induction tube 3100 to eject the gas. Meanwhile, a negative pressure is formed on the surrounding environment to induce the air. The induced air and the gas are delivered to the first receiving cavity 2410 to be mixed, and are finally ejected from the first flame outlet 1531.

[00176] The second induction tube 3200 has a Venturi structure. The second induction tube 3200 is connected to the stove 2000 to bring the second induction tube 3200 to be in communication with the second receiving cavity 2420. The second induction tube 3200 has a mixture intaking end 3210 engaged with the nozzle. The nozzle is aligned with the mixture
 5 intaking end 3210 of the second induction tube 3200 to eject the gas. Meanwhile, the blown air enters through the mixture intaking end 3210 of the second induction tube 3200, for example, by forced blowing of a fan 4000. The blown air and the gas are delivered to the second receiving cavity 2420 to be mixed, and are finally ejected from the second flame outlet 1621. The fan 4000 may be connected and fixed to the second induction tube 3200 to more facilitate the cooperation
 10 of fan 4000 and the mixture intaking end 3210 of the second induction tube 3200.

[00177] The third induction tube 3300 has a Venturi structure. The third induction tube 3300 is connected to the stove 2000. In this way, the third induction tube 3300 is in communication with the third receiving cavity 2430. The mixture intaking end 3310 of the third induction tube 3300 is engaged with the nozzle. The nozzle is aligned with the mixture intaking end 3310 of the third
 15 induction tube 3300 to eject the gas. Meanwhile, the negative pressure is formed on the surrounding environment to induce the air. The induced air and the gas are delivered to the third receiving cavity 2430 to be mixed, and are finally ejected from the third flame outlet 1430.

[00178] The gas is supplied through the first induction tube 3100, the second induction tube 3200, and the third induction tube 3300. When being at a minimum intensity, the flame may be
 20 formed only at the third flame outlet 1430.

[00179] As illustrated in FIG. 17 and FIG. 18, in some embodiments, the flame cover 1000 includes an outer flame cover 1100, an inner flame cover 1200, and a middle flame cover 1300. The outer flame cover 1100 has a first flame outlet 1531 and a second flame outlet 1621. The inner
 25 flame cover 1200 has a third flame outlet 1430. The outer flame cover 1100 surrounds the inner flame cover 1200. The middle flame cover 1300 shields a space between the outer flame cover 1100 and the inner flame cover 1200.

[00180] In an exemplary embodiment of the invention, the outer flame cover 1100 has the first flame outlet 1531 and the second flame outlet 1621, and thus an outer ring flame may be generated at the outer flame cover 1100 to form. The inner flame cover 1200 has the third flame outlet 1430,
 30 and thus an inner ring flame may be generated at the inner flame cover 1200. The so-called outer flame cover 1100 is a part of the flame cover 1000 close to or located at an outer side of the flame cover 1000. Correspondingly, the inner flame cover 1200 is a part of the flame cover 1000 close to or located at a center of the flame cover 1000. In this way, the outer flame cover 1100 surrounds the inner flame cover 1200 and is spaced apart from the inner flame cover 1200 by a predetermined
 35 distance. This arrangement also allows the outer ring flame and the inner ring flame to be spaced apart from each other by a predetermined distance, increasing a flame ejecting area. To prevent the space between the outer flame cover 1100 and the inner flame cover 1200 from being exposed and dirt and practices from being accumulated at the exposed space, the middle flame cover 1300 is provided to shield the space between the outer flame cover 1100 and the inner flame cover 1200.
 40 The so-called shielding means that the space between the outer flame cover 1100 and the inner flame cover 1200 is no longer visible when viewed from top to bottom, thus preventing debris and other contaminants from entering the space between the outer flame cover 1100 and the inner flame cover 1200. It can be understood that since the middle flame cover 1300 shields the space between the outer flame cover 1100 and the inner flame cover 1200, the middle flame cover 1300
 45 is connected to the outer flame cover 1100 at the outer side of the middle flame cover 1300, and is connected to the inner flame cover 1200 at the inner side of the middle flame cover 1300. In this

way, a top surface of the flame cover 1000 is a solid structure in a direction from the inner flame cover 1200 to the outer flame cover 1100. With the flame cover as illustrated in FIG. 15, the top surface of the flame cover 1000 is almost entirely a solid structure other than the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430. This arrangement makes integrity of the flame cover 1000 better and makes it easier to clean and maintain.

[00181] It can be understood that the middle flame cover 1300 may be a separately prepared component, or integrally formed with at least a part of the outer flame cover 1100, or integrally formed with at least a part of the inner flame cover 1200.

[00182] As illustrated in FIG. 18, in some embodiments, the inner flame cover 1200 is connected and fixed to the middle flame cover 130. In this way, the inner flame cover 1200 and the middle flame cover 1300 are constructed as an independent device and may be disassembled and assembled synchronously. For example, the middle flame cover 1300 includes a first cover 1310 and a second cover 1320. The first cover 1310 extends vertically and surrounds the inner flame cover 1200. The first cover 1310 and the inner flame cover 1200 are connected and fixed to each other. The second cover 1320 is disposed at a top of the first cover 1310 and extends towards the outer flame cover 1100 to block the space between the outer flame cover 1100 and the inner flame cover 1200.

[00183] As illustrated in FIG. 15 to FIG. 17, in some embodiments, the inner flame cover 1200 is disposed at the center of the burner 100. That is, a flame generated at the inner flame cover 1200 is located within a center of the flame ejecting range. In this way, it is more beneficial for the gas cooker to be in a minimum-flame cooking state. For example, the inner flame cover 1200 covers the center of the burner 100.

[00184] Further, the inner flame cover 1200 is a porous ceramic plate, and such porous structure allows the inner flame cover 1200 to have a plurality of third flame outlets 1430. By designing the inner flame cover 1200 as the porous ceramic plate, the inner flame cover 1200 can generate infrared combustion, i.e., the inner flame cover 1200 is formed as an infrared combustion flame cover, which is beneficial to realization of minimum-flame combustion. In addition, a flame hole thermal intensity of the inner flame cover 1200 is small, which can realize full premixed combustion and reduce the demand for the secondary air even without supplementing of the secondary air (i.e. without entrainment of the surrounding air or excess oxygen ejected from the second flame outlet 1621). For example, the porous ceramic plate is mainly made of infrared ceramic materials.

[00185] As illustrated in FIG. 15 to FIG. 17, in some embodiments, a top surface of the middle flame cover 1300 is designed to be planar. Since the middle flame cover 1300 shields the space between the outer flame cover 1100 and the inner flame cover 1200, when the top surface of the middle flame cover 1300 is planar, the integrity of the flame cover 1000 is further improved, making the flame cover 1000 easier to be cleaned. In particular, when the top surface of the middle flame cover 1300 is formed as the top surface of the flame cover 1000, user's wiping action is smoother and less obstructed when cleaning the top surface of the flame cover 1000. For example, the top surface of the middle flame cover 1300 shown in FIG. 15 is a horizontal plane.

[00186] Further, as illustrated in FIG. 17 and FIG. 18, the middle flame cover 1300 is adapted to be abutted against an inner wall of the outer flame cover 1100 in a radial direction of the burner 100. In general, the middle flame cover 1300 is supported by the stove 2000 in a gravity direction, and is abutted against the inner wall of the outer flame cover 1100 in the radial direction of the burner 100. In this way, the middle flame cover 1300 is restricted in two directions and is more stable. It can be understood that when the gas cooker is in a use environment, an up-down direction

is an axial direction, the gravity direction is from top to bottom in the axial direction, and the radial direction is perpendicular to the axial direction.

[00187] As illustrated in FIG. 15 to FIG. 18, in some embodiments, the outer flame cover 1100 includes a first flame cover 1110, a second flame cover 1120, and a third flame cover 1130. The first flame cover 1110 surrounds the second flame cover 1120, and the first flame outlet 1531 is formed between the first flame cover 1110 and the second flame cover 1120. The second flame cover 1120 surrounds the third flame cover 1130, and the second flame outlet 1621 is formed between the second flame cover 1120 and the third flame cover 1130. The middle flame cover 1300 is disposed between the third flame cover 1130 and the inner flame cover 1200 to shield the space between the outer flame cover 1100 and the inner flame cover 1200. In this way, the first flame outlet 1531, the second flame outlet 1621, and the third flame cover 1430 are arranged sequentially from the outside to the inside.

[00188] It can be understood that the middle flame cover 1300 and the outer flame cover 1100 may be separate components, or may be at least partially formed integrally. The middle flame cover 1300 and the inner flame cover 1200 may be separate components, or may be at least partially formed integrally. For example, as illustrated in FIG. 15 to FIG. 18, the middle flame cover 1300, the outer flame cover 1100, and the inner flame cover 1200 are separate components and are engaged with each other through assembling. As illustrated in FIG. 28 to FIG. 30, the middle flame cover 1300 and the third flame cover 1130 are integrally formed. That is, both the middle flame cover 1300 and the third flame cover 1130 are included in one component. In addition, the middle flame cover 1300 and the inner flame cover 1200 are separate components.

[00189] In some embodiments, a plurality of first flame outlets 1531 are provided, which means two or more first flame outlets 1531 are provided. That is, at least two first flame outlets 1531 are provided. The plurality of first flame outlets 1531 are arranged at intervals in a ring shape. For example, the plurality of first flame outlets 1531 are arranged at intervals in a ring shape in a circumferential direction of the burner 100. The circumferential direction may be understood as a direction around the center of the burner 100. The plurality of first flame outlets 1621 can eject the mixture to generate flames, which can realize the heating for the cooker in a wide range. In addition to the above situation, it is also possible that, as illustrated in FIG. 17 and FIG. 18, in some embodiments, the first flame outlet 1531 is of an annular slit shape, and the first flame outlet 1531 of the annular slit shape may also realize the heating of the cooker in a wide range.

[00190] In some embodiments, a plurality of second flame outlets 1621 are provided, which means two or more second flame outlets 1621. That is, at least two second flame outlets 1621 are provided. The plurality of second flame outlets 1621 are arranged at intervals in a ring shape. For example, the plurality of second flame outlets 1621 are arranged at intervals in a ring shape in the circumferential direction of the burner 100. The circumferential direction may be understood as the direction around the center of the burner 100. The plurality of second flame outlets 1621 can eject the mixture to generate flames, which can realize the heating of the cooker in a wide range. In addition to the above situation, it is also possible that, as illustrated in FIG. 17 and FIG. 18, in some embodiments, the second flame outlet 1621 is of an annular slit shape. The second flame outlet 1621 of the annular slit shape may realize the heating of the cooker in a wide range. In addition, when being designed into the annular slit shape, the second flame outlet 1621 is continuous in the circumferential direction of the burner 100, allowing the excess oxygen in the mixture ejected from the second flame outlet 1621 to increase its contact with the gas ejected from the first flame outlet 1531 or the third flame outlet 1430, further improving an oxygen supplement effect.

[00191] As illustrated in FIG. 17 and FIG. 18, in some embodiments, a plurality of third flame outlets 1430 are provided, which means two or more third flame outlets 1430. That is, at least two third flame outlets 1430 are provided. The plurality of third flame outlets 1430 are arranged at intervals in a ring shape or arranged densely in a ring shape. In addition to the above situation, it is also possible that, in some embodiments, the third flame outlet 1430 is of an annular slit shape.

[00192] Since the first flame outlet 1531 is located further from the center of the burner 100 than the second flame outlets 1621, when the plurality of first flame outlets 1531 are provided and arranged in the ring shape, the plurality of first flame outlets 1531 surround the second flame outlet 1621 (the plurality of second flame outlets 1621 may be provided or the second flame outlet 1621 may be of an annular slit shape). When the first flame outlet 1531 is of the annular slit shape, the first flame outlet 1531 of the annular slit shape surrounds the second flame outlet 1621 (the plurality of second flame outlets 1621 may be provided or the second flame outlet 1621 may be of an annular slit shape). Since the second flame outlet 1621 is located further from the center of the burner 100 than the third flame outlet 1430, when the plurality of second flame outlets 1621 are provided and arranged in the ring shape, the plurality of second flame outlets 1621 surround the third flame outlet 1430 (the plurality of third flame outlets 1430 may be provided or the third flame outlet 1430 may be of an annular slit shape). When the second flame outlet 1621 is of an annular slit shape, the second flame outlet 1621 of the annular slit shape surrounds the third flame outlet 1430 (the plurality of third flame outlets 1430 may be provided or the third flame outlet 1430 may be of an annular slit shape).

[00193] Embodiments of the invention also disclose a gas cooker. The gas cooker includes the above-described burner 100. The burner 100 includes a first flame outlet 1531, a second flame outlet 1621, and a third flame outlet 1430. The first flame outlet 1531 is used for ejecting of induced air and a gas. The second flame outlet 1621 is used for ejecting of blown air and the gas. The third flame outlet 1430 is used for ejecting of the induced air and the gas. Moreover, the second flame outlet 1621 is located closer to a center of the burner 100 than the first flame outlet 1531, and the third flame outlet 1430 is located closer to the center of the burner 100 than the second flame outlet 1621.

[00194] The second flame outlet 1621 is used for ejecting of the blown air and the gas. The blown air can provide sufficient oxygen to allow for full combustion of the gas ejected from the second flame outlet 1621. The first flame outlet 1531 is used for ejecting of the induced air and the gas. The third flame outlet 1430 is used for ejecting of the induced air and the gas. The second flame outlet 1621 is formed between the first flame outlet 1531 and the third flame outlet 1430. Secondary air required for the flame generated at the first flame outlet 1531 can be provided by excess oxygen generated by the blown air, and secondary air required for the flame generated at the third flame outlet 1430 can also be provided by the excess oxygen generated by the blown air. With this arrangement, the gas ejected from the first flame outlet 1531, the second flame outlet 1621, and the third flame outlet 1430 can be fully burned, resulting in high combustion efficiency and contributing to improvement of thermal efficiency of the gas cooker.

[00195] In some embodiments, the gas cooker includes a valve (not shown) for adjusting a gas flow rate. The valve may maintain gas supply to the first flame outlet 1531 and/or the third flame outlet 1430 when gas supply to the second flame outlet 1621 is interrupted by the valve, and at this time, a fan 4000 of the gas cooker is still in an operation state.

[00196] In an exemplary embodiment of the invention, the valve is a device for adjusting the gas flow rate, and has an inlet connected to a gas pipeline and an outlet connected to a nozzle. Flow rates of the gas finally delivered to the first flame outlet 1531, the second flame outlet 1430,

and the third flame outlet 1430 are adjusted by an adjustment of the valve. A specific structure of the valve may refer to the related art, and details thereof are omitted herein. When the valve is adjusted until the gas supply to the second flame outlet 1621 is interrupted, the gas supply to the first flame outlet 1531 and/or the third flame outlet 1430 may still be maintained, and at this time, the fan 4000 is also in the operation state. In this way, the air (the blown air) forcibly delivered by the fan 4000 is ejected through the second flame outlet 1621 to be supplemented to the mixture ejected from the first flame outlet 1531 and/or the third flame outlet 1430. It can be understood that the fan 4000 may be started synchronously when the gas cooker is ignited. No matter how the valve is adjusted, the fan 4000 still maintains its operation state and is closed until the gas cooker is shut down. In other embodiments of the invention, other control logic may also be used, and details thereof are omitted herein.

[00197] Embodiments of the invention also disclose an integrated electrical appliance. The integrated electrical appliance includes the gas cooker according to the above embodiments. The so-called integrated electrical appliance is a device that integrates functions of the gas cooker and another traditional electrical appliance. For example, at least one of a microwave oven, an oven, a steamer, and a hood may be integrated with the gas cooker to form the integrated electrical appliance. In other embodiments of the invention, the integrated electrical appliance is not limited to the electrical appliances as described above, and any combination, which integrates with the gas cooker and may provide more functions than a separate gas cooker, may be considered as the integrated electrical appliance. It can be understood that since the gas cooker of the integrated electrical appliance of this embodiment adopts the technical solutions of the embodiments as described above, the gas cooker at least has the beneficial effects brought by the technical solutions of the embodiments as described above, and details thereof are omitted herein.

CLAIMS

1. A burner (100) comprising:

a first flame outlet (1531); and

a second flame outlet (1621), wherein:

the first flame outlet (1531) is located farther from a center of the burner (100) than the second flame outlet (1621); and

one of the first flame outlet (1531) and the second flame outlet (1621) is adapted for ejecting of a gas and blown air, and the other one of the first flame outlet (1531) and the second flame outlet (1621) is adapted for ejecting of the gas and induced air.

2. The burner (100) according to claim 1, wherein a flame generated at the other one of the first flame outlet (1531) and the second flame outlet (1621) is adapted to perform flame stabilization on the one of the first flame outlet (1531) and the second flame outlet (1621).

3. The burner (100) according to claim 1 or 2, further comprising a first mixture outlet channel (1500),

wherein the first mixture outlet channel (1500) has a tip end formed as the first flame outlet (1531) and at least one first corner (1540) located upstream of the first flame outlet (1531).

4. The burner (100) according to claim 3, wherein the first mixture outlet channel (1500) comprises:

a first upstream flow segment (1510);

a first midstream flow segment (1520); and

a first downstream flow segment (1530) with a tip end formed as the first flame outlet (1531),

wherein the at least one first corner (1540) is formed at an intersection between the first upstream flow segment (1510) and the first midstream flow segment (1520) and at an intersection between the first midstream flow segment (1520) and the first downstream flow segment (1530).

5. The burner (100) according to claim 4, wherein the first downstream flow segment (1530) is inclined away from the center of the burner (100) from the first midstream flow segment (1520).

6. The burner (100) according to any one of claims 1 to 5, further comprising a second mixture outlet channel (1600),

wherein the second mixture outlet channel (1600) has a tip end formed as the second flame outlet (1621) and at least one second corner (1630) located upstream of the second flame outlet (1621).

7. The burner (100) according to claim 6, wherein the second mixture outlet channel (1600) comprises:

a second upstream flow segment (1610); and

a second downstream flow segment (1620) with a tip end formed as the second flame outlet (1621),

wherein the at least one second corner (1630) is formed at an intersection between the second upstream flow segment (1610) and the second downstream flow segment (1620).

8. The burner (100) according to claim 7, wherein the second downstream flow segment

(1620) is inclined away from the center of the burner (100) from the second upstream flow segment (1610).

9. The burner (100) according to any one of claims 1 to 8, wherein:

the first flame outlet (1531) is of an annular slit shape and surrounds the second flame outlet (1621); and/or
the second flame outlet (1621) is of an annular slit shape.

10. The burner (100) according to any one of claims 1 to 8, wherein:

a plurality of first flame outlets (1531) are provided, the plurality of first flame outlets (1531) being arranged at intervals in a ring shape and surrounding the second flame outlet (1621); and/or
a plurality of second flame outlets (1621) are provided, the plurality of second flame outlets (1621) being arranged at intervals in a ring shape.

11. The burner (100) according to any one of claims 1 to 10, further comprising:

a stove (2000) having a first receiving cavity (2410) and a second receiving cavity (2420);
and

a flame cover (1000) disposed at the stove (2000), the flame cover (1000) comprising a first flame cover (1110), a second flame cover (1120), and a third flame cover (1130), wherein:

the first flame cover (1110) surrounds the second flame cover (1120), the first flame outlet (1531) being formed between the first flame cover (1110) and the second flame cover (1120) and being in communication with the first receiving cavity (2410); and

the second flame cover (1120) surrounds the third flame cover (1130), the second flame outlet (1621) being formed between the second flame cover (1120) and the third flame cover (1130) and being in communication with the second receiving cavity (2420).

12. The burner (100) according to claim 11, wherein:

a first mixture outlet channel (1500) is formed between the first flame cover (1110) and the second flame cover (1120); and

a second mixture outlet channel (1600) is formed between the second flame cover (1120) and the third flame cover (1130).

13. The burner (100) according to claim 11 or 12, wherein the stove (2000) has a first annular wall (2100), a second annular wall (2200), and a third annular wall (2300), wherein:

the first annular wall (2100) surrounds the second annular wall (2200), the first receiving cavity (2410) being formed between the first annular wall (2100) and the second annular wall (2200);

the second annular wall (2200) surrounds the third annular wall (2300), the second receiving cavity (2420) being formed between the second annular wall (2200) and the third annular wall (2300);

the first flame cover (1110) is of a ring shape and disposed at the first annular wall (2100);
the second flame cover (1120) is of a ring shape and disposed at the second annular wall (2200); and

the third flame cover (1130) is of a ring shape and disposed at the third annular wall (2300).

14. The burner (100) according to any one of claims 11 to 13, further comprising:

a first induction tube (3100) connected to the stove (2000) and in communication with the first receiving cavity (2410); and

a second induction tube (3200) connected to the stove (2000) and in communication with the second receiving cavity (2420),

wherein one of a mixture intaking end (3110) of the first induction tube (3100) and a mixture intaking end (3210) of the second induction tube (3200) is adapted to receive the gas and the blown air, and the other one of the mixture intaking end (3110) of the first induction tube (3100) and the mixture intaking end (3210) of the second induction tube (3200) is adapted to receive the gas and the induced air.

15. The burner (100) according to claim 14, wherein the burner (100) further comprises a fan (4000) adapted to provide the blown air, the fan (4000) being connected and fixed to the first induction tube (3100) or the second induction tube (3200).

16. The burner (100) according to any one of claims 1 to 8, wherein:
the first flame outlet (1531) is adapted for ejecting of the gas and the induced air;
the second flame outlet (1621) is adapted for ejecting of the gas and the blown air; and
the burner (100) further comprises a third flame outlet (1430) adapted for ejecting of the gas and the induced air, the third flame outlet (1430) being located closer to the center of the burner (100) than the second flame outlet (1621).

17. The burner (100) according to claim 16, wherein:
the first flame outlet (1531) and the second flame outlet (1621) are disposed at a same wall.
a thickness of a wall between the first flame outlet (1531) and the second flame outlet (1621) is smaller than or equal to 6 mm.

18. The burner (100) according to 16 or 17, further comprising a stove (2000) and a flame cover (1000) disposed at the stove (2000),
wherein the flame cover (1000) has the first flame outlet (1531), the second flame outlet (1621), and the third flame outlet (1430).

19. The burner (100) according to claim 18, wherein the flame cover (1000) comprises:
an outer flame cover (1100) having the first flame outlet (1531) and the second flame outlet (1621);
an inner flame cover (1200) having the third flame outlet (1430) and surrounded by the outer flame cover (1100); and
a middle flame cover (1300) shielding a space between the outer flame cover (1100) and the inner flame cover (1200).

20. The burner (100) according to claim 19, wherein:
the inner flame cover (1200) and the middle flame cover (1300) are connected and fixed to each other; and/or
the inner flame cover (1200) is disposed at the center of the burner (100); and/or
the inner flame cover (1200) is a porous ceramic plate.

21. The burner (100) according to claim 19 or 20, wherein:

a top surface of the middle flame cover (1300) is planar; and/or
 the top surface of the middle flame cover (1300) is formed as a top surface of the flame cover (1000); and/or
 the middle flame cover (1300) is adapted to be abutted against an inner wall of the outer flame cover (1100) in a radial direction of the burner (100).

22. The burner (100) according to any one of claims 19 to 21, wherein the outer flame cover (1100) comprises a first flame cover (1110), a second flame cover (1120), and a third flame cover (1130), wherein:

the first flame cover (1110) surrounds the second flame cover (1120), the first flame outlet (1531) being formed between the first flame cover (1110) and the second flame cover (1120);

the second flame cover (1120) surrounds the third flame cover (1130), the second flame outlet (1621) being formed between the second flame cover (1120) and the third flame cover (1130); and

the middle flame cover (1300) is disposed between the third flame cover (1130) and the inner flame cover (1200) to shield the space between the outer flame cover (1100) and the inner flame cover (1200).

23. The burner (100) according to claim 22, wherein the middle flame cover (1300) and the third flame cover (1130) are integrally formed.

24. The burner (100) according to any one of claims 18 to 23, wherein:

the stove (2000) has a first receiving cavity (2410), a second receiving cavity (2420), and a third receiving cavity (2430), the first flame outlet (1531) being in communication with the first receiving cavity (2410), the second flame outlet (1621) being in communication with the second receiving cavity (2420), and the third flame outlet (1430) being in communication with the third receiving cavity (2430); and

the burner (100) further comprises a first induction tube (3100), a second induction tube (3200), and a third induction tube (3300), wherein the first induction tube (3100) is in communication with the first receiving cavity (2410) and adapted to receive the gas and the induced air, wherein the second induction tube (3200) is in communication with the second receiving cavity (2420) and adapted to receive the gas and the blown air, and wherein the third induction tube (3300) is in communication with the third receiving cavity (2430) and adapted to receive the gas and the induced air.

25. The burner (100) according to any one of claims 16 to 24, wherein:

a plurality of first flame outlets (1531) are provided, the plurality of first flame outlets (1531) being arranged at intervals in a ring shape and surrounding the second flame outlet (1621); and/or

a plurality of second flame outlets (1621) are provided, the plurality of second flame outlets (1621) being arranged at intervals in a ring shape and surrounding the third flame outlet (1430); and/or

a plurality of third flame outlets (1430) are provided.

26. The burner (100) according to any one of claims 16 to 24, wherein:

the first flame outlet (1531) is of an annular slit shape and surrounds the second flame outlet (1621); and/or

the second flame outlet (1621) is of an annular slit shape and surrounds the third flame outlet

(1430); and/or

the third flame outlet (1430) is of an annular slit shape.

27. A gas cooker, comprising the burner (100) according to any one of claims 1 to 26.

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28. The gas cooker according to claim 27, further comprising a valve adapted to adjust a gas flow rate,

10 wherein when gas supply to one of the first flame outlet (1531) and the second flame outlet (1621) is interrupted by the valve, the valve maintains gas supply to the other one of the first flame outlet (1531) and the second flame outlet (1621), and a fan (4000) of the gas cooker is in an operation state to provide the blown air.

15 29. The gas cooker according to claim 28, wherein when gas supply to the second flame outlet (1621) is interrupted by the valve, the valve maintains gas supply to the first flame outlet (1531) and/or a third flame outlet (1430), and the fan (4000) of the gas cooker is in the operation state to provide the blown air.

30. An integrated electrical appliance, comprising the gas cooker according to any one of claims 27 to 29.