



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.10.2018 Bulletin 2018/41

(51) Int Cl.:
F23D 14/06 (2006.01)

(21) Application number: **18164495.6**

(22) Date of filing: **28.03.2018**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **BSH Hausgeräte GmbH**
81739 München (DE)

(72) Inventors:
• **Chen, Yongliang**
Nanjing City, 210000 (CN)
• **Jiang, Feng**
Nanjing, 210000 (CN)
• **Zeng, Qingzhong**
Nanjing city, 210000 (CN)

(30) Priority: **06.04.2017 CN 201710219907**

(54) **BURNER FOR GAS COOKTOP AND GAS COOKTOP**

(57) The present invention relates to a burner for gas cooktop and a gas cooktop. The burner (1) comprises a burner base (3) and a fire cap, wherein the fire cap comprises an inner-ring fire cap (5) and an outer-ring fire cap (2) surrounding a periphery of the inner-ring fire cap (5), and the inner-ring fire cap (5) and the outer-ring fire cap (2) are provided with flame holes (150) for gas to flow out; and the burner (1) further comprises a first air passage and a second air passage, the first air passage supplies air to burning of the gas flowing out from the flame hole (150) on the outer-ring fire cap (2), the second air passage supplies air to burning of the gas flowing out from the flame hole (150) on the inner-ring fire cap (5), and the air supply of the first air passage and the air supply of the second air passage are independent of each other. Thus, the amounts of secondary air supplied to the burner can satisfy the demands by adjusting or controlling the amount of air supply of the first air passage and/or second air passage.

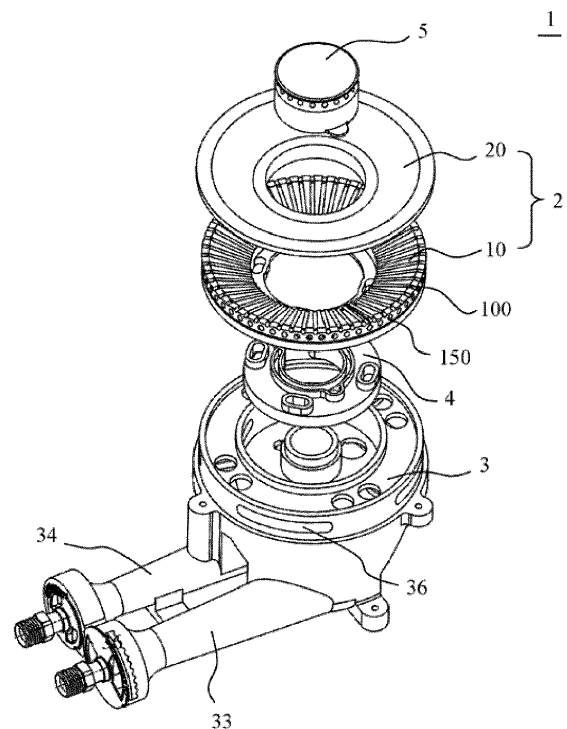


FIG. 1

Description

BACKGROUND

Technical Field

[0001] The present invention relates to the field of gas cooktops, and particularly to a burner for gas cooktop and a gas cooktop with the burner.

Related Art

[0002] The gas of a gas cooktop must be premixed with the air sucked by an ejector tube before burning. The mixed gas flows out through the flame hole of the burner and is ignited to form flame. In the industry, the air that is normally sucked by the ejector tube and used for mixing with the gas is called primary air, and the air that is supplied when the gas is burned is called secondary air, and the secondary air for burning is generally supplied by the airflow around the burner.

[0003] However, on most occasions, the air flow around the burner cannot meet the burning requirements. In particular, for burners with large thermal loads that have been favored by consumers in recent years, burning requirements cannot be satisfied only through the air flow around the burners, easily resulting in insufficient burning and low thermal efficiency. Moreover, gas burning is not sufficient, and it may cause gases that are harmful to the human body and environment.

SUMMARY

[0004] To solve at least one of the technical problems above, the present invention provides an improved burner for gas cooktop and a gas cooktop with the burner.

[0005] In order to achieve the technical goals, the present invention provides the following technical scheme: a burner for gas cooktop, comprising a burner base and a fire cap, wherein the fire cap comprises an inner-ring fire cap and an outer-ring fire cap surrounding a periphery of the inner-ring fire cap, and the inner-ring fire cap and the outer-ring fire cap are provided with flame holes for gas to flow out; and the burner further comprises a first air passage and a second air passage, the first air passage supplies air to burning of the gas flowing out from the flame hole on the outer-ring fire cap, and the second air passage supplies air to burning of the gas flowing out from the flame hole on the inner-ring fire cap, wherein the air supply of the first air passage and the air supply of the second air passage are independent of each other.

[0006] The inner-ring fire cap of a common burner has the functions of igniting and maintaining small fire. Generally, the thermal load of the inner-ring fire cap of the burner is lower than the thermal load of the outer-ring fire cap of the burner, for example, the thermal load of the inner-ring fire cap is 0.8kw, and the thermal load of the

outer-ring fire cap is 3.2kw. Therefore, in the burning process of the burner, the amount of air required by the inner-ring fire cap of the burner per unit time is different from that of the outer-ring fire cap of the burner. If different amounts of air supplied to the outer-ring fire cap and inner-ring fire cap of the burner are achieved only through the structural design of the first air passage and the second air passage, high requirements for structural design and manufacturing will be needed. Errors in the actual manufacturing process may easily cause the air supply or ratio of the inner and outer rings of the finally manufactured burner to deviate from the preset value, thereby causing excessive or insufficient secondary air supply of the inner-ring fire cap or the outer-ring fire cap of the burner. Excessive secondary air supply results in waste of resources, and insufficient supply can lead to insufficient gas burning.

[0007] It should be noted that the "gas" mentioned in the present invention is not limited to pure gas, but it should include the mixture of gas and air, for example, a gas mixture that is premixed with the air drawn in at the ejector tube.

[0008] The air supply of the first air passage and the air supply of the second air passage are independent to each other, so that the amounts of secondary air supplied to the outer-ring fire cap and the inner-ring fire cap of the burner can satisfy the demands by regulating or controlling the amount of the air supply of the first air passage and/or the air supply of the second air passage. According to the burner of the present invention, the structural and manufacturing requirements for the first air passage and the second air passage can be lowered.

[0009] "The air supply of the first air passage and the air supply of the second air passage are independent of each other" should be understood as: when the air supply amount of one or more of the air passages is changed, the air supply amount of the rest air passages is not influenced, and the changes of the air supply amounts of the air passages are not influenced to each other. For example, the first air passage is connected to a first air generation apparatus, and the second air passage is connected to a second air generation apparatus; for another example, the first air passage is connected to an air generation apparatus, and the second air passage is connected to an opening communicated with atmosphere; for still another example, the first air passage and the second air passage are connected to a same air generation apparatus, but the air flows entering the first air passage and the second air passage can be respectively independently controlled; or, the first air passage is connected to an opening communicated with atmosphere, the second air passage is connected to another opening communicated with atmosphere, and the sizes of the two openings can be respectively independently adjusted. The above is illustrated by limited examples, and it is not excluded that there are other possibilities.

[0010] It should be understood that the "outer-ring fire cap" and the "inner-ring fire cap" referred to in the present

invention may be independent components or an integral component. For example, in an embodiment, the burner comprises an integral fire cap, and the outer-ring fire cap and the inner-ring fire cap respectively refer to the peripheral area of the fire cap and the center area of the fire cap.

[0011] In addition to the foregoing technical scheme, the present invention also provides such a technical scheme: a burner for gas cooktop, comprising a burner base and a fire cap, wherein the fire cap comprises an inner-ring fire cap and an outer-ring fire cap surrounding a periphery of the inner-ring fire cap, and the inner-ring fire cap and the outer-ring fire cap are provided with flame holes for gas to flow out; and the burner further comprises a first air passage and a second air passage, the first air passage supplies air to burning of the gas flowing out from the flame hole on the outer-ring fire cap, and the second air passage supplies air to burning of the gas flowing out from the flame hole on the inner-ring fire cap, wherein air flow of the first air passage and/or air flow of the second air passage is appropriate to be independently controlled.

[0012] Thus, the secondary air amount supplied to the inner-ring fire cap and/or the outer-ring fire cap can be adjusted according to the actual thermal load of the inner-ring fire cap and/or the outer-ring fire cap of the burner, and accurate control of the secondary air supply amount can be realized. In an actual use process, when the air supply amount or ratio of the first air passage and/or the second air passage does not conform to a preset value, it can be independently adjusted.

[0013] "Air flow of the first air passage and/or air flow of the second air passage is appropriate to be independently controlled" should include, but not limited to, the following situations: the first air passage is connected to the first air generation apparatus, the second air passage is connected to the second air generation apparatus, and the first air generation apparatus and the second air generation apparatus can be respectively independently controlled; or, the first air passage is connected to an air generation apparatus, the second air passage is connected to an opening communicated with atmosphere, and the size of the opening can be adjusted; for another example, the first air passage and the second air passage are connected to a same air generation apparatus, but the air flows entering the first air passage and the second air passage can be respectively independently controlled; or, the first air passage is connected to an opening communicated with atmosphere, the second air passage is connected to another opening communicated with atmosphere, and the sizes of the two openings can be respectively independently adjusted. The first air generation apparatus and/or second air generation apparatus can be a fan, blast blower, air pump or the like.

[0014] In a possible embodiment, the burner base is provided with a first air entrance and a second air entrance respectively connected to air sources, the first air entrance and the second air entrance are independent

of each other, the first air entrance is communicated with the first air passage, and the second air entrance is communicated with the second air passage. The first air entrance and the second air entrance are arranged on the burner base, are simple in structure and convenient to manufacture, and have little influence on the structure of the whole burner.

[0015] In a possible embodiment, the first air entrance is connected to a first air generation apparatus, the second air entrance is connected to a second air generation apparatus, and air flow of the first air generation apparatus and air flow of the second air generation apparatus are respectively independently controlled; or the first air entrance and the second air entrance are respectively connected to a same air generation apparatus, and air flow entering the first air entrance and air flow entering the second air entrance are respectively independently controlled. When the first air entrance and the second air entrance are respectively connected to the same air generation apparatus, the air generation apparatus may be provided with two flow control components (such as valves) to respectively independently control the air flows entering the first air passage and the second air passage, or the sizes of the first air entrance and the second air entrance are respectively adjustable, so that the sizes respectively independently control the air flows entering the first air passage and the second air passage.

[0016] In a possible embodiment, the first air entrance and the second air entrance are openings communicated with atmosphere. The sizes of the first air entrance and/or second air entrance can be independently adjusted.

[0017] In a possible embodiment, the first air entrance has a diameter greater than a diameter of the second air entrance. Since the thermal load of the outer-ring fire cap is greater than the thermal load of the inner-ring fire cap, the burning of gas on the outer-ring fire cap needs supply of more secondary air, and the first air entrance has the diameter greater than that of the second air entrance so as to supply more secondary air to the outer-ring fire cap.

[0018] In a possible embodiment, the first air entrance is connected to an air generation apparatus, and the second air entrance is an opening communicated with atmosphere. Under normal circumstances, the thermal load of the outer-ring fire cap of the burner is 3-4 times the thermal load of the inner-ring fire cap. For some burners, supply of secondary air to burning of the inner-ring fire cap through an opening communicated with atmosphere can satisfy the demand. By being connected to the air generation apparatus, the outer-ring fire cap can usually supply more secondary air to meet the requirement of sufficient burning.

[0019] In a possible embodiment, the burner for gas cooktop comprises an intermediate member located between the burner base and the fire cap, wherein the intermediate member comprises a first connection cavity and a second connection cavity that are separated from each other, the first connection cavity is communicated with the first air entrance, and the second connection

cavity is communicated with the second air entrance.

[0020] In a possible embodiment, the intermediate member is completely accommodated within the burner base, i.e., the intermediate member in the use state is not exposed and is not higher than the burner base. The advantage of such a structural design is that the intermediate member does not increase the height of the whole burner, the structure of the whole burner is compact, and the presence of the intermediate member has no influence on the appearance of the burner, so the burner of the present invention is visually indistinguishable from existing burners.

[0021] In a possible embodiment, the outer-ring fire cap comprises a lower cap body and an upper cap body disposed on the lower cap body, a dent portion for accommodating gas is formed on the bottom of the lower cap body, the lower cap body is provided with a plurality of the flame holes communicated with the dent portion, a first air outlet passage is formed between the upper cap body and the lower cap body, the upper cap body is disposed on the lower cover body to form an air accommodation cavity for accommodating air, and the first air outlet passage communicates the air accommodation cavity with the outside; and the first air passage comprises the first connection cavity, the air accommodation cavity and the first air outlet passage. The first air outlet passage can provide sufficient secondary air for burning of the gas on the outer-ring fire cap. Moreover, the first air outlet passage is disposed on the outer-ring fire cap, the air flows out from the outer-ring fire cap, and the direction of the airflow is substantially the same as that of the gas, so sufficient secondary air can be supplied to the vicinity of the flame hole without disturbing the burning flame, thereby ensuring sufficient and stable burning of the gas on the outer-ring fire cap. Further, the air converges into the air accommodation cavity and then flows through the first air outlet passage to the outside. The air accommodation cavity can play a role of buffering the air flow so that the air can flow out from various first air outlet passages uniformly and stably.

[0022] In a possible embodiment, the first connection cavity comprises a first connection cavity inlet corresponding to the first air entrance, the first connection cavity further comprises a plurality of first connection cavity outlets communicated with the air accommodation cavity, and the plurality of first connection cavity outlets is distributed at an equal distance along a circumferential direction. Thus, the air can enter the air accommodation cavity from the first connection cavity more uniformly; and the air entering the air accommodation cavity can be mixed more uniformly.

[0023] In a possible embodiment, the inner-ring fire cap comprises a cap body and a surrounding wall body, the wall body defines a dent portion for accommodating gas, the flame hole is communicated with the dent portion, and the wall body is provided with a second air outlet passage; and the second air passage comprises the second connection cavity and the second air outlet passage.

Thus, the air flows out from the wall body, and the direction of the air flow is substantially the same as that of the gas, so sufficient secondary air can be supplied to the vicinity of the flame hole without disturbing the burning flame, thereby ensuring sufficient and stable burning of the gas on the burner. Moreover, the scheme of the embodiment does not substantially influence the appearance of the inner-ring fire cap.

[0024] In a possible embodiment, the second connection cavity comprises a second connection cavity inlet corresponding to the second air entrance and a second connection cavity outlet communicated with the second air outlet passage, and the second connection cavity outlet is a continuous ring slot. Thus, the air flowing out from the second connection cavity enters the second air outlet passage on the inner-ring fire cap more uniformly.

[0025] Herein, the present invention also provides a gas cooktop, which comprises the foregoing burner for gas cooktop.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

FIG. 1 is an exploded view of the burner for gas cooktop of an embodiment of the present invention;

FIG. 2 is a three-dimensional view of the burner base of an embodiment of the present invention;

FIG. 3 is a three-dimensional view of the intermediate member of an embodiment of the present invention;

FIG. 4 is a three-dimensional view of the intermediate member of the embodiment as shown in FIG. 3 from another visual angle;

FIG. 5 is an exploded view of the outer-ring fire cap of an embodiment of the present invention;

FIG. 6 is a cross-sectional view of the burner of an embodiment of the present invention; and

FIG. 7 is a three-dimensional view of the inner-ring fire cap of an embodiment of the present invention.

Reference Numbers:

[0027]

1-Burner; 2-Outer-ring Fire Cap; 3-Burner Base; 4-Intermediate Member; 5-Inner-ring Fire Cap; 10-Lower Cap Body; 11-Outer Wall; 12-Top Wall; 13-Concave Wall; 20-Upper Cap Body; 31,32-Chambers; 33-Outer-ring Ejector Tube; 34-Inner-ring Ejector Tube; 35-Gas Passages; 36-Air Supply Inlet; 37-Air Supply Outlet; 51-Cap Body; 52-Wall Body; 100-

First Air Outlet Passage; 110-First Groove; 120-Second Groove; 150,501-Flame Holes; 200-Air Accommodation Cavity; 201-Air Accommodation Cavity Entrance; 301-First Air Entrance; 302-Second Air Entrance; 401-First Connection Cavity Inlet; 402-Second Connection Cavity Inlet; 403-First Connection Cavity Outlet; 404-Second Connection Cavity Outlet; 500-Second Air Outlet Passage; 520-Notch Portion; 521-Bottom Surface.

DETAILED DESCRIPTION

[0028] In order to further understand the purpose, structure, features and functions of the present invention, the detailed description of the embodiments is provided as follows.

[0029] Referring to FIG. 1, FIG. 1 is an exploded view of the burner for gas cooktop of an embodiment of the present invention. The burner 1 for gas cooktop comprises a burner base 3 and a fire cap, wherein the fire cap comprises an inner-ring fire cap 5 and an outer-ring fire cap 2 surrounding a periphery of the inner-ring fire cap 2. The outer-ring fire cap 2 is provided with a flame hole 150 for gas to flow out, and the inner-ring fire cap 5 is also provided with a flame hole 501 for gas to flow out (shown in FIG. 7). The burner 1 further comprises a first air passage and a second air passage, the first air passage supplies air to burning of the gas flowing out from the flame hole 150 on the outer-ring fire cap 2, and the second air passage supplies air to burning of the gas flowing out from the flame hole 501 on the inner-ring fire cap 5, wherein the air supply of the first air passage and the air supply of the second air passage are independent of each other. Air flow of the first air passage and/or air flow of the second air passage is appropriate to be independently controlled.

[0030] The structure of the burner, and the first air passage and the second air passage will be specifically introduced below. Firstly referring to FIG. 2 with reference to FIG. 6, FIG. 2 is a three-dimensional view of the burner base of an embodiment of the present invention. The burner base 3 comprises an outer-ring ejector tube 33 and an inner-ring ejector tube 34, air is sucked into the ejector tube through the opening of the ejector tube, and the gas entering the outer-ring ejector tube 33 through a gas nozzle and the air sucked into the ejector tube enter a chamber 31 (shown in FIG. 6) through a plurality of gas passages 35 on the burner base 3, flow out through the flame hole 150 and are ignited to form outer-ring flame. In order to ensure sufficient burning of the gas, the air required for burning of the gas is supplied by using the relevant structure of the burner. Firstly, a plurality of air supply inlets 36 is disposed on the outer surface of the burner base 3, and a plurality of air supply outlets 37 respectively corresponding to the air supply inlets 36 is disposed on the inner surface of the burner base 3. Thus, when the burner 1 is burning, air enters from the air supply inlets 36 and reaches the inside of the burner 1 from the

air supply outlets 37. However, the supplied air cannot satisfy the burning demand, so the following improvements have also been made in the present embodiment.

[0031] The burner base 3 is provided with a first air entrance 301 and a second air entrance 302 respectively connected to air sources. The first air entrance 301 and the second air entrance 302 are independent to each other, and the first air entrance 301 has a diameter greater than a diameter of the second air entrance 302. The first air entrance 301 is communicated with the first air passage, and the second air entrance 302 is communicated with the second air passage. In the present embodiment, the first air entrance 301 and the second air entrance 302 are respectively connected to a same air generation apparatus (not shown), and air flow entering the first air entrance 301 and air flow entering the second air entrance 302 can be respectively independently controlled. The air generation apparatus in the present embodiment is a fan.

[0032] Referring to FIG. 1, FIG. 3 and FIG. 4, FIG. 3 is a three-dimensional view of the intermediate member of an embodiment of the present invention; and FIG. 4 is a three-dimensional view of the intermediate member of the embodiment as shown in FIG. 3 from another visual angle. The burner 1 further comprises an intermediate member 4 located between the burner base 3 and the fire cap, wherein the intermediate member 4 is completely accommodated within the burner base 3. The intermediate member 4 comprises a first connection cavity and a second connection cavity that are separated from each other. The first connection cavity is communicated with the first air entrance 301, and the second connection cavity is communicated with the second air entrance 302. The first connection cavity comprises a first connection cavity inlet 401 corresponding to the first air entrance 301 and a plurality of first connection cavity outlets 403. The plurality of first connection cavity outlets 403 is distributed at an equal distance along a circumferential direction. The second connection cavity comprises a second connection cavity inlet 402 corresponding to the second air entrance 302 and a second connection cavity outlet 404 which is a continuous ring slot.

[0033] Referring to FIG. 5 with reference to FIG. 6, FIG. 5 is an exploded view of the outer-ring fire cap of an embodiment of the present invention; and FIG. 6 is a cross-sectional view of the burner of an embodiment of the present invention. In order to better show the structural details, FIG. 6 is a revolved cross-sectional view. The outer-ring fire cap 2 comprises a lower cap body 10 and an upper cap body 20 disposed on the lower cap body 10. A dent portion for accommodating gas is formed on the bottom of the lower cap body 10, and the dent portion and the burner base 3 are matched to form a chamber 31 for accommodating gas. The lower cap body 10 is provided with a plurality of flame holes (150) communicated with the dent portion, and a first air outlet passage 100 is formed between the upper cap body 20 and the lower cap body 10. The upper cap body 20 is disposed

on the lower cap body 10 to form an air accommodation cavity 200 for accommodating air, and the first air outlet passage 100 communicates the air accommodation cavity 200 with outside. After the burner 1 is assembled, a plurality of first connection cavity outlets 403 is respectively communicated with the air accommodation cavity 200. Particularly, the air accommodation cavity 200 comprises four air accommodation cavity inlets 201 facing the intermediate member 3, and each first connection cavity outlet 403 is respectively aligned with one air accommodation cavity inlet 201. The first air passage of the embodiment comprises the first connection cavity, the air accommodation cavity 200 and the first air outlet passage 100.

[0034] A more specific description of the structure of the outer-ring fire cap is as follows: the lower cap body 10 comprises an outer wall 11, a top wall 12 and a concave wall 13, the top wall 12 is connected to the outer wall 11, and the concave wall 13 is connected to the top wall 12. Each first air outlet passage 100 comprises a first groove 110 formed on the outer wall 11 and top wall 12, and a second groove 120 formed on the concave wall 13, and the first groove 110 is communicated with the second groove 120. The plurality of first air outlet passages 100 is radially distributed on the lower cap body 10. When the upper cap body 20 is disposed on the lower cap body 10, the air in the air accommodation cavity 200 flows out from the first grooves 110 and the second grooves 120. In addition, the outlet end of each first air outlet passage 100 is located near the flame hole 150. In order to uniformly supply the air, every two adjacent flame holes 150 correspond to one first air outlet passage 100, and every two adjacent flame holes 150 and the outlet end of the corresponding first air outlet passage 100 are distributed in a triangular way.

[0035] Thus, the air entering from the air generation apparatus through the first air entrance 301 reaches the first connection cavity via the first connection cavity inlet 401, and the air in the first connection cavity reaches the air accommodation cavity 200 via the first connection cavity outlet 403 and finally flows to the outside via the first air outlet passage 100.

[0036] Referring to FIG. 7 with reference to FIG. 6, FIG. 7 is a three-dimensional view of the inner-ring fire cap of an embodiment of the present invention. The inner-ring fire cap 5 comprises a cap body 51 and a surrounding wall body 52, the wall body 52 defines a dent portion for accommodating gas, and the dent portion 50 and the burner base 3 are matched to form a chamber 32 for accommodating gas. The flame hole 501 is communicated with the dent portion, and the wall body 52 is provided with a second air outlet passage 500. The second air passage comprises a second connection cavity and a second air outlet passage 500. After the burner 1 is assembled, the second air outlet passage 500 is communicated with the second connection cavity outlet 404.

[0037] Specifically, the outlet end of the second air outlet passage 500 is located above the flame hole 501. The

wall body 52 is provided with a notch portion 520 not penetrating through the wall body 52, the inlet end of the second air outlet passage 500 is located on the bottom surface 521 of the wall body 52, the outlet end of the second air outlet passage 500 is located on the notch portion 520, and the flame hole 501 is also located on the notch portion 520. Thus, the flame hole 501 and the outlet end of the second air outlet passage 500 are both located within the vertical projection range of the cap body 51, thereby preventing the soup and spillage from polluting or blocking the flame hole 501 and the second air outlet passage 500.

[0038] Thus, the air entering from the air generation apparatus through the second air entrance 302 reaches the second connection cavity via the second connection cavity inlet 402, and the air in the second connection cavity reaches the second air outlet passage 500 via the second connection cavity outlet 404 and finally flows to the outside via the second air outlet passage 500.

[0039] In the foregoing embodiment, the air generation apparatus may also be a blast blower or air pump. In another embodiment of the present invention, the first air entrance 301 is connected to a first air generation apparatus, the second air entrance 302 is connected to a second air generation apparatus, and air flow of the first air generation apparatus and air flow of the second air generation apparatus can be respectively independently controlled. In still another embodiment of the present invention, the first air entrance 301 is connected to an air generation apparatus, the air flow of the air generation apparatus can be independently controlled, and the second air entrance 302 is an opening communicated with atmosphere. In yet another embodiment of the present invention, the first air entrance 301 and the second air entrance 302 are respectively an opening communicated with atmosphere, but the sizes of the first air entrance 301 and the second air entrance 302 are adjustable, for example, the first air entrance 301 and the second air entrance 302 are respectively provided with a movable baffle piece, and the air flows entering the first air entrance 301 and the second air entrance 302 are adjusted through moving the baffle pieces.

[0040] The present invention also provides a gas cooktop which comprises the burner 1 for gas cooktop according to any embodiment above.

[0041] Various embodiments of the individual components described in combination with FIG. 1 to FIG. 7 may be combined with one another in any given manner to achieve the advantages of the present invention. The present invention has been described by the above related embodiments, but the above embodiments are merely examples for implementing the present invention. It must be pointed out that the disclosed embodiments do not limit the scope of the present invention. On the contrary, all changes and modifications made without departing from the spirit and scope of the present invention shall fall into the protection scope of the present invention.

Claims

1. A burner (1) for gas cooktop, comprising a burner base (3) and a fire cap, wherein the fire cap comprises an inner-ring fire cap (5) and an outer-ring fire cap (2) surrounding the inner-ring fire cap (5), and the inner-ring fire cap (5) and the outer-ring fire cap (2) are provided with flame holes (150, 501) for gas to flow out; and the burner (1) further comprises a first air passage and a second air passage, the first air passage supplies air to burning of the gas flowing out from the flame hole (150) on the outer-ring fire cap (2), and the second air passage supplies air to burning of the gas flowing out from the flame hole (501) on the inner-ring fire cap (5), **characterized in that** the air supply of the first air passage and the air supply of the second air passage are independent of each other.
2. A burner (1) for gas cooktop, comprising a burner base (3) and a fire cap, wherein the fire cap comprises an inner-ring fire cap (5) an outer-ring fire cap (2) surrounding the inner-ring fire cap (5), and the inner-ring fire cap (5) and the outer-ring fire cap (2) are provided with flame holes (150, 501) for gas to flow out; and the burner (1) further comprises a first air passage and a second air passage, the first air passage supplies air to burning of the gas flowing out from the flame hole (150) on the outer-ring fire cap (2), and the second air passage supplies air to burning of the gas flowing out from the flame hole (501) on the inner-ring fire cap (5), **characterized in that** air flow of the first air passage and/or air flow of the second air passage is appropriate to be independently controlled.
3. The burner (1) for gas cooktop according to claim 1 or 2, **characterized in that**, the burner base (3) is provided with a first air entrance (301) and a second air entrance (302) respectively connected to air sources, the first air entrance (301) and the second air entrance (302) are independent of each other, the first air entrance (301) is communicated with the first air passage, and the second air entrance (302) is communicated with the second air passage.
4. The burner (1) for gas cooktop according to claim 3, **characterized in that**, the first air entrance (301) is connected to a first air generation apparatus, the second air entrance (302) is connected to a second air generation apparatus, and air flow of the first air generation apparatus and air flow of the second air generation apparatus are respectively independently controlled; or the first air entrance (301) and the second air entrance (302) are respectively connected to a same air generation apparatus, and air flow entering the first air entrance (301) and air flow entering the second air entrance (302) are respectively independently controlled.
5. The burner (1) for gas cooktop according to claim 3, wherein the first air entrance (301) and the second air entrance (302) are openings communicated with atmosphere.
6. The burner (1) for gas cooktop according to claim 5, **characterized in that**, the first air entrance (301) has a diameter greater than a diameter of the second air entrance (302).
7. The burner (1) for gas cooktop according to claim 3, **characterized in that**, the first air entrance (301) is connected to an air generation apparatus, and the second air entrance (302) is an opening communicated with atmosphere.
8. The burner (1) for gas cooktop according to claim 3, **characterized by** comprising an intermediate member (4) located between the burner base (3) and the fire cap, wherein the intermediate member (4) comprises a first connection cavity and a second connection cavity that are separated from each other, the first connection cavity is communicated with the first air entrance (301), and the second connection cavity is communicated with the second air entrance (302).
9. The burner (1) for gas cooktop according to claim 8, **characterized in that**, the intermediate member (4) in a use state is completely accommodated within the burner base (3).
10. The burner (1) for gas cooktop according to claim 8, **characterized in that**, the outer-ring fire cap (2) comprises a lower cap body (10) and an upper cap body (20) disposed on the lower cap body (10), a dent portion for accommodating gas is formed on the bottom of the lower cap body (10), the lower cap body (10) is provided with a plurality of flame holes (150) communicated with the dent portion, a first air outlet passage (100) is formed between the upper cap body (20) and the lower cap body (10), the upper cap body (20) is disposed on the lower cap body (10) to form an air accommodation cavity (200) for accommodating air, and the first air outlet passage (100) communicates the air accommodation cavity (200) with outside; and the first air passage comprises the first connection cavity, the air accommodation cavity (200), and the first air outlet passage (100).
11. The burner (1) for gas cooktop according to claim 10, **characterized in that**, the first connection cavity comprises a first connection cavity inlet (401) corresponding to the first air entrance (301), the first con-

nection cavity further comprises a plurality of first connection cavity outlets (403) communicated with the air accommodation cavity (200), and the plurality of first connection cavity outlets (403) is distributed at an equal distance along a circumferential direction. 5

12. The burner (1) for gas cooktop according to claim 8, **characterized in that**, the inner-ring fire cap (5) comprises a cap body (51) and a surrounding wall body (52), the wall body (52) defines a dent portion for accommodating gas, the flame hole (501) is communicated with the dent portion, and the wall body (52) is provided with a second air outlet passage (500); and the second air passage comprises the second connection cavity and the second air outlet passage (500). 10 15

13. The burner (1) for gas cooktop according to claim 12, **characterized in that**, the second connection cavity comprises a second connection cavity inlet (402) corresponding to the second air entrance (302) and a second connection cavity outlet (404) communicated with the second air outlet passage (500), and the second connection cavity outlet (404) is a continuous ring slot. 20 25

14. A gas cooktop, **characterized by** comprising a burner (1) for gas cooktop according to any one of claims 1 to 13. 30

35

40

45

50

55

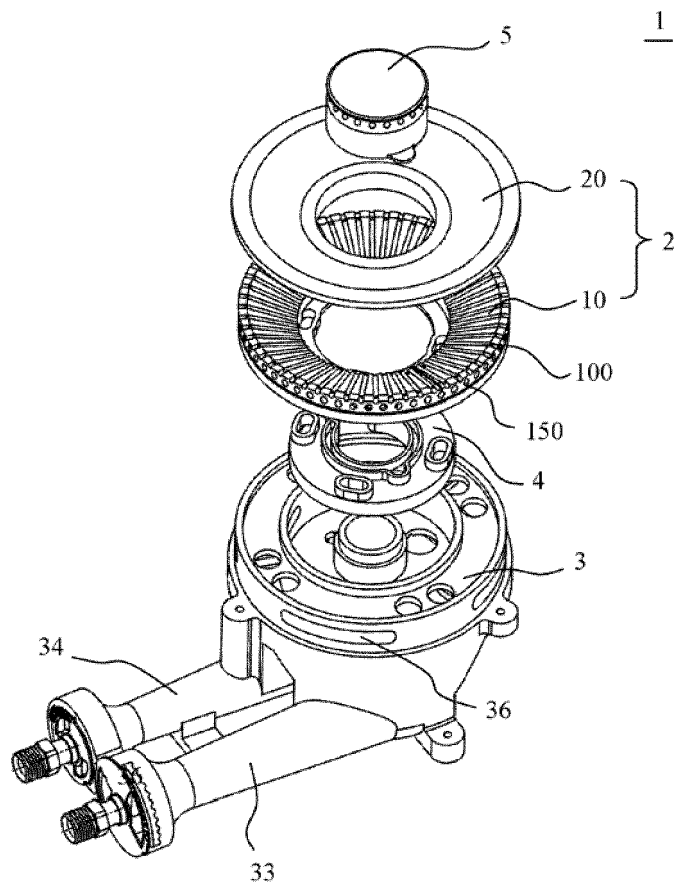


FIG. 1

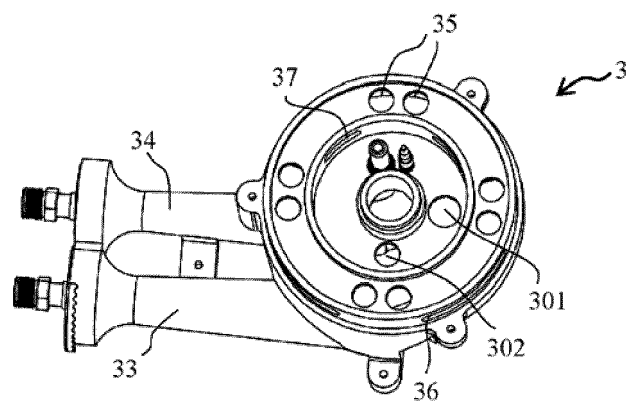


FIG. 2

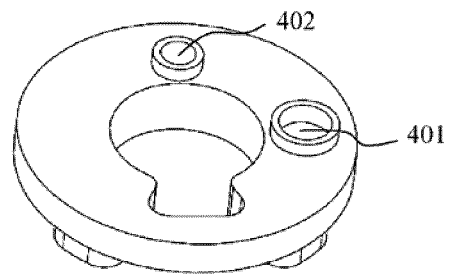


FIG. 3

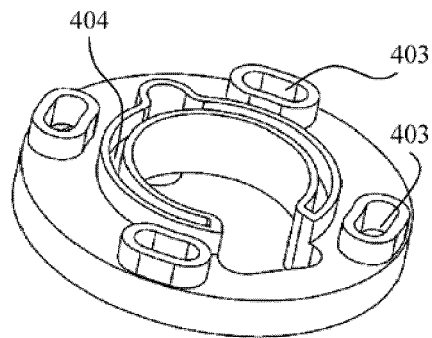


FIG. 4

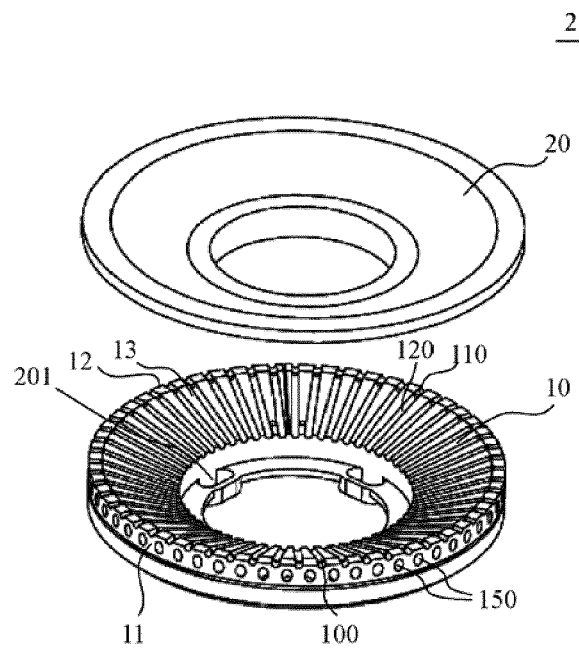


FIG. 5

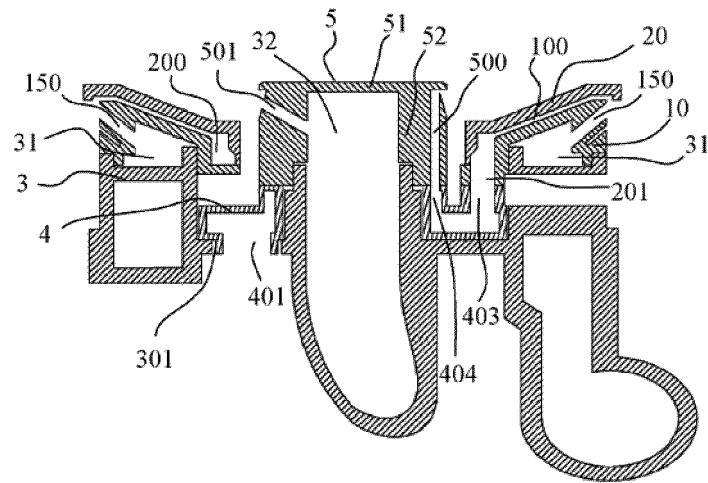


FIG. 6

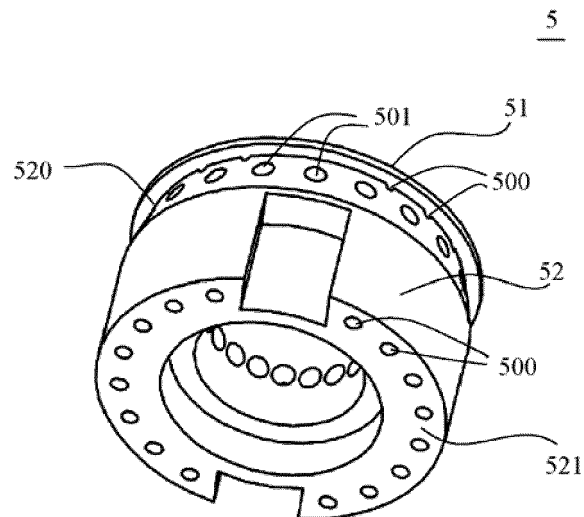


FIG. 7



EUROPEAN SEARCH REPORT

 Application Number
 EP 18 16 4495

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 201 373 405 Y (BEIJING YANSHAN IND GAS EQUIPMENT CO LTD) 30 December 2009 (2009-12-30) * the whole document *	1-3,5-7, 14	INV. F23D14/06
Y	----- US 5 213 091 A (BEACH STANLEY H [US]) 25 May 1993 (1993-05-25) * column 1, line 42 - line 48; figure 1 *	4	
Y	----- EP 2 211 095 A2 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 28 July 2010 (2010-07-28) * paragraph [0030] - paragraph [0032]; figures 1-5 *	4	
Y	----- EP 2 211 095 A2 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 28 July 2010 (2010-07-28) * paragraph [0030] - paragraph [0032]; figures 1-5 *	1-7,14	
Y	----- US 5 405 263 A (GERDES MICHAEL D [US] ET AL) 11 April 1995 (1995-04-11) * column 4, line 17 - line 30; figure 4 *	1-7,14	
A	----- DE 39 18 722 A1 (KUZSELKA OEDOEN GYOERGY DIPL I [DE]) 22 November 1990 (1990-11-22) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC)
			F23D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 July 2018	Harder, Sebastian
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 16 4495

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

30-07-2018

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
CN 201373405	Y	30-12-2009	NONE	
US 5213091	A	25-05-1993	CA 2084051 A1 US 5213091 A	25-01-1994 25-05-1993
EP 2211095	A2	28-07-2010	CN 101799161 A EP 2211095 A2 US 2010186730 A1	11-08-2010 28-07-2010 29-07-2010
US 5405263	A	11-04-1995	NONE	
DE 3918722	A1	22-11-1990	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82