



(11)

EP 4 317 788 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:

07.02.2024 Bulletin 2024/06

(21) Application number: **22923073.5**

(22) Date of filing: **28.03.2022**

(51) International Patent Classification (IPC):

F24C 3/08 ^(2006.01) **F24C 3/00** ^(2006.01)
F23D 14/08 ^(2006.01) **F23D 14/04** ^(2006.01)

(52) Cooperative Patent Classification (CPC):

F23D 14/04; F23D 14/08; F24C 3/00; F24C 3/08

(86) International application number:

PCT/CN2022/083295

(87) International publication number:

WO 2023/142255 (03.08.2023 Gazette 2023/31)

(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

(30) Priority: **26.01.2022 CN 202210096629**

25.02.2022 CN 202210181787

25.02.2022 CN 202220427694 U

(71) Applicants:

- **Foshan Shunde Midea Washing Appliances
Manufacturing Co., Ltd.
Foshan, Guangdong 528311 (CN)**

- **Midea Group Co., Ltd.**

Foshan, Guangdong 528311 (CN)

(72) Inventors:

- **LI, Song
Foshan, Guangdong 528311 (CN)**
- **XU, Guanyun
Foshan, Guangdong 528311 (CN)**
- **HE, Xiande
Foshan, Guangdong 528311 (CN)**

(74) Representative: **Whitlock, Holly Elizabeth Ann et al**

**Maucher Jenkins
Seventh Floor Offices
Artillery House
11-19 Artillery Row
London SW1P 1RT (GB)**

(54) **BURNER FOR GAS STOVE, AND GAS STOVE**

(57) A burner and a gas stove. A gas distribution member (100) of the burner is provided with an air passage (103), a gas passage (102), and a gas homogenizing portion (101, 119). An outer ring burner cap (300) and an inner ring burner cap (200) are both provided on the gas distribution member (100). The gas mixing cavity of the inner ring burner cap (200) is in communication with the gas outlet of the gas passage (102). The gas mixing cavity of the outer ring burner cap (300) is in communication with the gas mixing cavity of the inner ring burner cap (200) through the air passage (103). The gas homogenizing portion (101, 119) is in communication with the gas passage (102) and the air passage (103). Gas is conveyed to the gas mixing cavity of the inner ring burner cap (200) through the gas passage (102), and is further conveyed to the gas mixing cavity of the outer ring burner cap (300) through the air passage (103). Since the gas distribution member (100) is provided with the gas homogenizing portion (101, 119) which is in communication with the gas passage (102) and the air passage (103), the gas inflow of the inner ring burner cap (200)

and the gas inflow of the outer ring burner cap (300) can be balanced, thus the phenomenon of insufficient combustion can be mitigated, and CO emissions can be reduced.

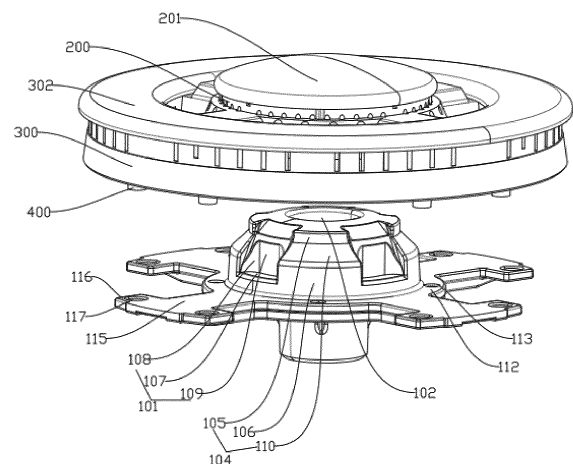


FIG. 2

EP 4 317 788 A1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priorities to Chinese Patent Application No. 202210096629.5, titled "BURNER AND GAS STOVE", filed on January 26, 2022, Chinese Patent Application No. 202210181787.0, titled "BURNER AND GAS STOVE", filed on February 25, 2022, and Chinese Patent Application No. 202220427694.7, titled "BURNER AND GAS STOVE", filed on February 25, 2022, all of which are incorporated herein by reference in their entireties.

FIELD

[0002] The present disclosure relates to the field of electric appliance technologies, and, more particularly, to a burner and a gas stove.

BACKGROUND

[0003] A burner is classified into an updraft burner and a downdraft burner, and the updraft burner has an ejection capability poorer than that of the traditional downdraft structure. For a single-nozzle updraft burner, it is difficult to distribute gas flowing through an inner ring fire cover and an outer fire cover. Moreover, the gas discharged from the nozzle preferentially passes through the inner ring fire cover, resulting in excessive gas inflow volume of the inner ring fire cover and insufficient gas inflow volume of the outer ring fire cover, thereby leading to insufficient burning and an increase in CO emissions.

SUMMARY

[0004] The present disclosure provides a burner and a gas stove, aiming to at least to some extent solve technical problems of insufficient burning and an increased in CO emissions due to excessive gas inflow volume of an inner ring fire cover and insufficient gas inflow volume of an outer ring fire cover in the related art.

[0005] One aspect of the present disclosure provides a burner. The burner includes: a gas distributor having a gas channel, a gas passage, and a gas homogenization portion; an inner ring fire cover disposed at the gas distributor; and an outer ring fire cover disposed at the gas distributor. The gas mixing cavity of the inner ring fire cover is in communication with a gas outlet end of the gas passage, and a gas mixing cavity of the outer ring fire cover is in communication with the gas mixing cavity of the inner ring fire cover through the gas channel. The gas passage is in communication with the gas channel through the gas homogenization portion, which balances gas quantity of the gas mixing cavity of the outer ring fire cover and gas quantity of the gas mixing cavity of the inner ring fire cover.

[0006] In the burner provided by the present disclosure,

gas is transmitted to the gas mixing cavity of the inner ring fire cover through the gas passage and then is transmitted to the gas mixing cavity of the outer ring fire cover through the gas channel. Since the gas distributor has the gas homogenization portion and the gas passage is in communication with the gas channel through the gas homogenization portion, gas inflow volume of the inner ring fire cover and gas inflow volume of the outer ring fire cover can be balanced to improve a phenomenon of insufficient burning and reduce CO emissions. Thus, practicability is good.

[0007] In an embodiment of the present disclosure, the gas homogenization portion is further provided with a flow guide groove located at the gas channel, and the gas passage is in communication with the gas channel through the flow guide groove. The gas channel has an end in communication with the gas outlet end of the gas passage and another end in communication with the gas mixing cavity of the outer ring fire cover. The gas mixing cavity of the inner ring fire cover is in communication with the gas outlet end of the gas passage.

[0008] In an embodiment of the present disclosure, the gas homogenization portion includes the flow guide groove formed in the gas channel and configured to communicate between the gas passage and the gas channel. The flow guide groove can increase volume of the gas channel, thereby reducing a discharge pressure of the gas channel. In this way, an ejection force can be increased to some extent to facilitate flowing of the gas to the gas mixing cavity of the outer ring fire cover. Therefore, a load of the inner ring fire cover is reduced to balance the gas inflow volume of the inner ring fire cover and the gas inflow volume of the outer ring fire cover. Thus, the burning is more sufficient to reduce the CO emissions. As a result, the practicability is good.

[0009] In an embodiment of the present disclosure, the gas distributor includes an inner ring gas inlet portion provided with the gas passage in an axial direction of the inner ring gas inlet portion and provided with a plurality of flow guide grooves arranged at intervals along an outer circumferential surface of the inner ring gas inlet portion.

[0010] In an embodiment of the present disclosure, a ratio of an inner diameter of an annular region formed by the plurality of flow guide grooves to a diameter of the gas passage is greater than or equal to 1.5: 1.

[0011] In an embodiment of the present disclosure, the inner ring gas inlet portion includes: a first cylinder body, and a second cylinder body connected to an outer circumferential surface of the first cylinder body. The first cylinder body has the gas passage that penetrates in an axial direction of the first cylinder body; a height of a top of the second cylinder body is lower than a height of a top of the first cylinder body, and the flow guide groove extends from the top of the first cylinder body to a middle of an outer circumferential surface of the second cylinder body.

[0012] In an embodiment of the present disclosure, the top of the first cylinder body has a guide tangent plane

corresponding to the flow guide groove, a top of the guide tangent plane is located at a middle of the top of the first cylinder body, and a bottom of the guide tangent plane is located at a top of the corresponding flow guide groove.

[0013] In an embodiment of the present disclosure, the inner ring gas inlet portion further includes a transition cylinder body located between the outer circumferential surface of the first cylinder body and the top of the second cylinder body, a top of the transition cylinder body having a gradually decreasing height from inside to outside.

[0014] In an embodiment of the present disclosure, the gas mixing cavity of the inner ring fire cover has a gap with the inner ring gas inlet portion, the gap is located above the top of the inner ring gas inlet portion, and the inner ring fire cover is in communication with the outer ring fire cover through a plurality of cavities. Each of the plurality of cavities has the gas channel, the plurality of flow guide grooves is disposed correspondingly to the plurality of cavities, and the flow guide groove is formed in the gas channel of the corresponding cavity.

[0015] In an embodiment of the present disclosure, the gas distributor further has a gas inlet channel and a disturbance channel, and a gas inlet end of the gas channel is in communication with the gas outlet end of the gas passage through the gas inlet channel. A first end of the disturbance channel is in communication with and located at a middle of the gas passage, a second end of the disturbance channel is in communication with the gas channel, and a disturbance angle is formed between a gas outlet direction of the disturbance channel and a gas outlet direction of the gas inlet channel. The disturbance channel is configured as the gas homogenization portion.

[0016] In the burner according to the present disclosure, the gas that enters the gas passage may partially flow into the disturbance channel before being discharged from the gas outlet end of the gas passage, which can reduce gas flow volume of the gas mixing cavity of the inner ring fire cover, to decrease the load of the inner ring fire cover and balance the gas inflow volume of the inner ring fire cover and the gas inflow volume of the outer ring fire cover. At the same time, the gas discharged from the second end of the gas passage and gas discharged from the gas inlet channel form a swirling flow region when meeting in a gas inlet cavity, which increases disturbance and is beneficial to the mixing of the gas and the primary air. Thus, the burning is more sufficient to reduce the CO emissions. As a result, the practicability is good.

[0017] In an embodiment of the present disclosure, the gas distributor includes an inner ring gas inlet portion provided with the gas passage that penetrates in an axial direction of the inner ring gas inlet portion.

[0018] In an embodiment of the present disclosure, a plurality of disturbance channels are arranged at intervals around the axial direction of the inner ring gas inlet portion.

[0019] In an embodiment of the present disclosure, the first end of the disturbance channel is in communication

with and formed at the middle of the gas passage, and the second end of the disturbance channel penetrates a circumferential surface of the inner ring gas inlet portion.

[0020] In an embodiment of the present disclosure, the second end of the disturbance channel has a higher height than the first end of the disturbance channel.

[0021] In an embodiment of the present disclosure, the gas inlet channel has a first end in communication with the gas outlet end of the gas passage and a second end in communication with the gas channel, the first end of the gas inlet channel has a higher height than the second end of the gas inlet channel, and the second end of the gas inlet channel has a higher height than the second end of the disturbance channel.

[0022] In an embodiment of the present disclosure, the gas mixing cavity of the inner ring fire cover has a gap with the inner ring gas inlet portion, and the gap between the gas mixing cavity of the inner ring fire cover and the inner ring gas inlet portion is located above the inner ring gas inlet portion and limited as the gas inlet channel.

[0023] In an embodiment of the present disclosure, the gas distributor further includes an enclosing plate disposed at the circumferential surface of the inner ring gas inlet portion; and an outer side wall of the inner ring fire cover extends to the enclosing plate. The inner ring fire cover, the inner ring gas inlet portion, and the enclosing plate enclose a disturbance cavity having an open top, and the second end of the disturbance channel is in communication with the disturbance cavity through the disturbance cavity.

[0024] In an embodiment of the present disclosure, the inner ring fire cover is in communication with the outer ring fire cover through a plurality of cavities, and the plurality of cavities have the gas channels in communication with the plurality of disturbance channels through the disturbance cavity.

[0025] In an embodiment of the present disclosure, the gas distributor further includes a plurality of support plates arranged at intervals at an outer circumferential surface of the inner ring gas inlet portion, a bottom of each of the plurality of cavities has an opening and being sealed by a corresponding support plate, and the cavity and the corresponding support plate forms the gas channel with two open ends.

[0026] Another aspect of the present disclosure further provides a gas stove including the burner as mentioned above.

[0027] The gas stove according to the present disclosure can balance the gas inflow volume of the inner ring fire cover and the gas inflow volume of the outer ring fire cover, which improves the phenomenon of insufficient burning, and reduces the CO emissions. Therefore, the practicability is good.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028]

FIG. 1 is a schematic structural diagram of a burner according to an embodiment of the present disclosure.

FIG. 2 is an exploded view of FIG. 1.

FIG. 3 is a top view of FIG. 1.

FIG. 4 is a cross-sectional view taken along A-A illustrated in FIG. 3.

FIG. 5 is a schematic structural diagram of a gas distributor illustrated in FIG. 1.

FIG. 6 is a schematic structural diagram of FIG. 5 from another angle.

FIG. 7 is a schematic structural diagram of an outer ring fire cover and an inner ring fire cover illustrated in FIG. 1.

FIG. 8 is another schematic structural diagram of a burner according to an embodiment of the present disclosure.

FIG. 9 is an exploded view of FIG. 8.

FIG. 10 is a top view of FIG. 8.

FIG. 11 is a cross-sectional view taken along A-A in FIG. 10.

FIG. 12 is a schematic structural diagram of the gas distributor illustrated in FIG. 8.

FIG. 13 is a schematic diagram of fitting of the inner ring fire cover and the outer ring fire cover illustrated in FIG. 8.

FIG. 14 is a schematic structural diagram of FIG. 13 from another perspective.

[0029] Reference Numerals:

gas distributor-100; flow guide groove, gas homogenization portion-101; gas passage-102; gas channel-103; inner ring gas inlet portion-104; first cylinder body-1041; second cylinder body-1042; first through hole-1043; second through hole-1044; first cylinder body-105; second cylinder body-106; first side wall-107; second side wall-108; bottom wall-109; guide tangent plane-110; transition cylinder body-111; enclosing plate-112; first connection hole-113; connection rib plate-114; support plate-115; lug plate-116; second connection hole-117; gas inlet channel-118; and disturbance channel, gas homogenization portion-119.

inner ring fire cover 200; inner ring cover plate 201; first air vent 202; outer ring fire cover 300; second air vent 301; outer ring cover plate 302; second connection post-400; cavity 500; and first connection post 600.

DETAILED DESCRIPTION

[0030] The present disclosure provides a burner and a gas stove, aiming to at least to some extent solve technical problems of insufficient burning and an increased in CO emissions due to excessive gas inflow volume of an inner ring fire cover and insufficient gas inflow volume of an outer ring fire cover in the related art.

[0031] The burner and the gas stove are provided according to disclosure of the present disclosure. A gas distributor 100 of a burner 1000 has a gas channel 103, a gas passage 102, and a gas homogenization portion 101, 119. Each of an outer ring fire cover 300 and an inner ring fire cover 200 is disposed on the gas distributor 100. A gas mixing cavity of the inner ring fire cover 200 is in communication with a gas outlet end of the gas passage 102, and a gas mixing cavity of the outer ring fire cover 300 is in communication with the gas mixing cavity of the inner ring fire cover 200 through the gas channel 103. The gas passage 102 is in communication with the gas channel 103 through the gas homogenization portion 101, 119. Gas is transmitted to the gas mixing cavity of the inner ring fire cover 200 through the gas passage 102 and then is transmitted to the outer ring fire cover 300 through the gas channel 103. Since the gas distributor 100 has the gas homogenization portion 101, 119 and the gas passage 102 is in communication with the gas channel 103 through the gas homogenization portion 101, 119, gas inflow volume of the inner ring fire cover 200 and gas inflow volume of the outer ring fire cover 300 can be balanced to improve a phenomenon of insufficient burning and reduction in CO emissions. Thus, practicability is good.

Embodiment 1:

[0032] An embodiment of the present disclosure provides a burner, aiming to at least to some extent solve the technical problems of the insufficient burning and the increased in CO emissions due to the excessive gas inflow volume of the inner ring fire cover 200 and the insufficient gas inflow volume of the outer ring fire cover 300 in the related art.

[0033] FIG. 1 is a schematic structural diagram of a burner according to an embodiment of the present disclosure. FIG. 2 is an exploded view of FIG. 1. FIG. 3 is a top view of FIG. 1. FIG. 4 is a cross-sectional view taken along A-A illustrated in FIG. 3. With reference to FIG. 1 to FIG. 4, the burner includes a gas distributor 100, an inner ring fire cover 200, and an outer ring fire cover 300.

[0034] With reference to FIG. 1 to FIG. 4, the gas distributor 100 has a flow guide groove 101, a gas passage 102, and a gas channel 103. An end of the gas channel 103 is in communication with a gas outlet end of the gas passage 102. The gas passage 102 is in communication with the gas channel 103 through the flow guide groove 101. Each of the inner ring fire cover 200 and the outer ring fire cover 300 is disposed at the gas distributor 100. A gas mixing cavity of the inner ring fire cover 200 is in communication with the gas outlet end of the gas passage 102. A gas mixing cavity of the outer fire cover 300 is in communication with another end of the gas channel 103.

[0035] In the burner according to an embodiment of the present disclosure, the gas distributor 100 of the burner includes the gas passage 102 and the gas channel

103. The gas mixing cavity of the inner ring fire cover 200 is in communication with the gas inlet end of the gas passage 102. The end of the gas channel 103 is in communication with the gas outlet end of the gas passage 102, and the gas mixing cavity of the outer ring fire cover 300 is in communication with the other end of the gas channel 103. In this way, gas may be transmitted through the gas passage 102. A part of the transmitted gas is first transmitted to the gas mixing cavity of the inner ring fire cover 200 for burning in the inner ring fire cover 200, and another part of the transmitted gas is transmitted to the gas mixing cavity of the outer ring fire cover 300 through the gas channel 103 for burning in the outer ring fire cover 300. Since the gas passage 102 is in communication with the gas channel 103 through the flow guide groove 101 of the gas distributor 100, volume of the gas channel 103 can be increased, and a discharge pressure of the gas channel 103 can be reduced. In this way, an ejection force can be increased to some extent to facilitate flowing of the gas to the gas mixing cavity of the outer ring fire cover 300. Therefore, a load of the inner ring fire cover 200 is reduced to balance the gas inflow volume of the inner ring fire cover 200 and the gas inflow volume of the outer ring fire cover 300. Thus, the burning is more sufficient to reduce the CO emissions. As a result, the practicability is good.

[0036] FIG. 5 is a schematic structural diagram of a gas distributor illustrated in FIG. 1. With reference to FIG. 3, FIG. 4, and FIG. 5, the gas distributor 100 includes an inner ring gas inlet portion 104. The inner ring gas inlet portion 104 has the gas passage 102 in an axial direction of the inner ring gas inlet portion 104. An end of the gas passage 102 is a gas inlet end connected to an ejection pipe. Gas mixed with primary air may be transmitted to the gas passage 102 through the ejection pipe of the burner and discharged out of another end of the gas passage 102.

[0037] As illustrated in FIG. 5, a plurality of flow guide grooves 101 described above are arranged at intervals along an outer circumferential surface of the inner ring gas inlet portion 104. Preferably, at least four flow guide grooves 101 are arranged at equal intervals along the outer circumferential surface of the inner ring gas inlet portion 104, to guarantee a proper ejection force, and to balance the gas inflow volume of the inner ring fire cover 200 and the gas inflow volume of the outer ring fire cover 300. Therefore, the burning is more sufficient.

[0038] A ratio of an inner diameter of an annular region formed by the plurality of flow guide grooves 101 to a diameter of the gas passage 102 is greater than or equal to 1.5:1. A size of the flow guide groove 101 is associated with gas flow volume of the gas passage 102. As the gas flow volume increases, a required size of the channel increases, i.e., a larger size of the flow guide groove 101 is required. Only in this way can enough mixed gas be ensured to flow through the flow guide groove 101. Therefore, the ratio of the inner diameter of the annular region formed by the plurality of flow guide grooves 101 to the

diameter of the gas passage 102 is greater than or equal to 1.5:1 to ensure an amount of gas flowing through the flow guide groove 101. Thus, uniform mixing is facilitated, and a good ejection effect is ensured.

[0039] With reference to FIG. 2, FIG. 4 and FIG. 5, the inner ring gas inlet portion 104 includes a first cylinder body 105 and a second cylinder body 106. The first cylinder body 105 is provided with the gas passage 102 that penetrates in an axial direction of the first cylinder body 105. The second cylinder body 106 is connected to an outer circumferential surface of the first cylinder body 105. A height of a top of the second cylinder body 106 is lower than a height of a top of the first cylinder body 105, and the flow guide groove 101 extends from the top of the first cylinder body 105 to a middle of an outer circumferential surface of the second cylinder body 106.

[0040] With reference to FIG. 2, FIG. 4, and FIG. 5, the flow guide groove 101 includes one first side wall 107, two second side walls 108, and a bottom wall 109. The two second side walls 108 are disposed opposite to each other and each second side wall 108 extends from a top of the inner ring gas inlet portion 104 to a middle of an outer circumferential surface of the inner ring gas inlet portion 104. The first side wall 107 located at the bottom of the two second side walls 108, and the bottom wall 109 is located between the two second side walls 108 of the peripheral surface of the inner ring air intake portion 104. That is, the flow guide groove 101 is in a shape with a top opening and external opening which is enclosed by the first side wall 107, the two second side walls 108, and the bottom wall 109.

[0041] With reference to FIG. 2, FIG. 4, and FIG. 5, a guide tangent plane 110 corresponding to the flow guide groove 101 is formed at the top of the first cylinder body 105. A top of the guide tangent plane 110 is located at a middle of the top of the first cylinder body 105, and a bottom of the guide tangent plane 110 is located at a top of the corresponding flow guide groove 101. The guide tangent plane 110 can reduce resistance of the gas to flow towards the gas mixing cavity of the outer ring fire cover 300, which facilitates ejection of the gas.

[0042] With reference to FIG. 2 and FIG. 5, the guide tangent plane 110 may be disposed corresponding to the flow guide groove 101 and may be formed at an upper portion of the corresponding flow guide groove 101. Therefore, the gas may enter the flow guide groove 101 through the guide tangent plane 110 to further reduce the resistance of gas to the flow towards the gas mixing cavity of the outer ring fire cover 300, which facilitates the ejection of the gas.

[0043] With reference to FIG. 2, FIG. 4, and FIG. 5, the inner ring gas inlet portion 104 may further include a transition cylinder body 111 located between the outer circumferential surface of the first cylinder body 105 and the top of the second cylinder body 106. A top of the transition cylinder body 111 has a gradually decreasing height from inside to outside. That is, tops of the plurality

of flow guide grooves 101 are arranged at intervals on the transition cylinder body 111.

[0044] With reference to FIG. 4, the gas mixing cavity of the inner ring fire cover 200 has a gap with the inner ring gas inlet portion 104, and the gap is located above the top of the inner ring gas inlet portion 104. A part of gas discharged from the gas outlet end of the gas passage 102 of the inner ring gas inlet portion 104 may be distributed and ejected into the gas mixing cavity of the inner ring fire cover 200, and another part may flow out through the gap between the gas mixing cavity of the inner ring fire cover 200 and the top of the inner ring gas inlet portion 104.

[0045] With reference to FIG. 2, FIG. 4, and FIG. 5, the gas distributor 100 further includes an enclosing plate 112 connected to an outer circumferential surface of the inner ring gas inlet portion 104. The inner ring fire cover 200 may be supported on the enclosing plate 112 through a plurality of first connection posts 600 arranged at intervals to allow for fitting of the inner ring fire cover 200 on the gas distributor 100.

[0046] The enclosing plate 112 may be integrally formed at the outer circumferential surface of the second cylinder body 106 of the inner ring gas inlet portion 104. The first connection post 600 may be integrally formed at a bottom of the inner ring fire cover 200, and a bottom of the first connection post 600 may be connected to a first connection hole 113 formed in the enclosing plate 112.

[0047] FIG. 6 is a schematic structural diagram of FIG. 5 from another angle. With reference to FIG. 1, FIG. 2, FIG. 4, FIG. 5, and FIG. 6, a bottom of the first cylinder body 105 of the inner ring gas inlet portion 104 protrudes over the enclosing plate 112 to be configured to be connected to the ejection pipe of the burner. The top of the second cylinder body 106 and the top of the first cylinder body 105 may be integrally formed. A hollow may be formed between a bottom of the second cylinder body 106 and the bottom of the first cylinder body 105. An inner side of a circumferential surface of the second cylinder body 106 may be connected to an outer circumferential surface of the first cylinder body 105 through a plurality of connection rib plates 114 that are radially arranged. The bottom wall 109 of the flow guide groove 101 may protrude over the inner side the second cylinder body 106 and extend towards the outer circumferential surface of the first cylinder body 105. Therefore, a space of the flow guide groove 101 can be increased, which improves the ejection of the gas.

[0048] FIG. 7 is a schematic structural diagram of an outer ring fire cover and an inner ring fire cover in FIG. 1. With reference to FIG. 2, FIG. 4, FIG. 5 and FIG. 7, the inner ring fire cover 200 is in communication with the outer ring fire cover 300 through a plurality of cavities 500. The plurality of cavities 500 has gas channels 103. The flow guide groove 101 is disposed corresponding to the cavity 500, and the flow guide groove 101 is formed in the gas channel 103 of the corresponding cavity 500.

The other part of the gas flowing out from the gas outlet end of the gas passage 102 of the inner ring gas inlet portion 104 may be ejected into the gas mixing cavity of the outer ring fire cover 300 through the gas channels 103 of the plurality of cavities 500. Since the flow guide groove 101 is formed in the gas channel 103 of the corresponding cavity 500, the volume of the gas channel 103 can be increased, and the discharge pressure of the gas channel 103 can be reduce. In this way, the ejection force can be increased to some extent to facilitate the flowing of the gas to the gas mixing cavity of the outer ring fire cover 300. Therefore, the load of the inner ring fire cover 200 can be reduced to balance the gas inflow volume of the inner ring fire cover 200 and a gas inflow volume of the outer ring fire cover 300. Thus, the burning is more sufficient to reduce the CO emissions.

[0049] With reference to FIG. 2, FIG. 4, FIG. 5, and FIG. 7, the gas distributor 100 further includes a plurality of support plates 115 arranged at intervals at a circumferential surface of the enclosing plate 112. A bottom of each of the plurality of cavities 500 has an opening and is sealed by a corresponding support plate 115, and the cavity 500 and the corresponding support plate 115 are form as the gas channel 103 with two open ends.

[0050] It is necessary for the support plate 115 to have a thickness, and the bottom of each cavity 500 is snapped at both sides of the corresponding support plate 115 in a width direction of the corresponding support plate 115, to improve seal performance of a connection between the bottom of the cavity 500 and the corresponding support plate 115.

[0051] With reference to FIG. 2, FIG. 4, FIG. 5 and FIG. 7, a lug plate 116 is disposed at each of the two sides of an outer end of each support plate 115 in the width direction of the support plate 115, and a bottom of the gas mixing cavity of the outer ring fire cover 300 may be fixed on the lug plate 116 by a second connection post 400 (as illustrated in FIG. 14), to realize fitting of the outer ring fire cover 300 on the gas distributor 100.

[0052] In some embodiments, a top of the second connection post 400 may be integrally connected to the bottom of the gas mixing cavity of the outer ring fire cover 300, and the second connection post 400 may be connected in a second connection hole 117 formed at the lug plate 116.

[0053] Each lug plate 116, each support plate 115, the enclosing plate 112, and the inner ring gas inlet portion 104 that are composed of the gas distributor 100 may be integrally formed to provide the gas distributor 100 with a sufficient strength. Therefore, use reliability is improved.

[0054] With reference to FIG. 7, a plurality of first air vents 202 is arranged at intervals at an outer side wall of the inner ring fire cover 200, and secondary air may enter the gas mixing cavity of the inner ring fire cover through the plurality of first air vents 202 for the burning in the inner ring fire cover 200. A plurality of second air vents 301 is arranged at intervals along an inner side

wall of the outer ring fire cover 300, and the secondary air may enter the gas mixing cavity of the outer ring fire cover 300 through the plurality of second air vents 301 for the burning in the outer ring fire cover 300, to further improve burning efficiency of the burner. In addition, a plurality of fire holes is arranged at intervals along the outer side wall of each of the outer ring fire cover 300 and the inner ring fire cover 200 for formation of a flame.

[0055] In addition, with reference to FIG. 1, FIG. 2 and FIG. 7, the inner ring fire cover 200 further includes an inner ring cover plate 201 detachably disposed at a top of the inner ring fire cover 200 and located above the gas passage 101 to block gas discharged from a gas outlet end of the gas passage 101. Therefore, the gas flows to the fire holes of the inner ring fire cover 200 and the gas channel 103. The outer ring fire cover 300 further includes an outer ring cover plate 302 detachably disposed at a top of the outer ring fire cover 300, and therefore the fuel gas may flow to the fire holes of the outer ring fire cover 300 to facilitate the use of the burner.

[0056] As illustrated in FIG. 1, FIG. 2, and FIG. 7, the plurality of first air vents 202 may be formed at the top of the inner side wall of the inner ring fire cover 200, i.e., a top of the first air vent 202 is exposed. When the inner ring cover plate 201 covers the top of the inner ring fire cover 200, the top opening of the first air vent 202 may be sealed to allow the first air vent 202 to form as a gas inlet channel penetrating in a radial direction of the inner ring fire cover 200. Likewise, the second air vent 301 may be formed on the top of the inner side wall of the outer ring fire cover 300, i.e., a top of the second air vent 301 is exposed. When the outer ring cover plate 302 covers the top of the outer ring fire cover 300, the top opening of the second air vent 301 may be sealed to allow the second air vent 301 to form as a gas inlet channel penetrating in the radial direction of the outer ring fire cover 300.

[0057] It should be noted that the inner ring fire cover 200 is in communication with the outer ring fire cover 300 through the plurality of cavities 500, and the inner ring fire cover 200, the outer ring fire cover 300, and the plurality of cavities 500 may be integrally formed to improve the use reliability.

Embodiment 2:

[0058] FIG. 8 is another schematic structural diagram of a burner according to an embodiment of the present disclosure. FIG. 9 is an exploded view of FIG. 8. FIG. 10 is a top view of FIG. 8. FIG. 11 is a cross-sectional view taken along A-A illustrated in FIG. 10. With reference to FIG. 8 to FIG. 11, a burner includes a gas distributor 100, an inner ring fire cover 200, and an outer ring fire cover 300.

[0059] With reference to FIG. 8 to FIG. 11, the gas distributor 100 has a gas passage 102, a gas inlet channel 118, a turbulence channel 119, and a gas channel 103. An end of the gas channel 103 is in communication

with a gas outlet end of the gas passage 102 through the gas inlet channel 118. The disturbance channel 119 has a first end and a second end in communication with the first end. The first end of the disturbance channel 119 is in communication with a middle portion of the gas passage 102, and the second end of the disturbance channel 119 is in communication with the gas channel 103. A disturbance angle is formed between a gas outlet end of the disturbance channel 119 and a gas outlet end of the gas inlet channel 118. Each of the inner ring fire cover 200 and the outer ring fire cover 300 is disposed in the gas distributor 100. A gas mixing cavity of the inner ring fire cover 200 is in communication with gas passage 102, and a gas mixing cavity of the outer ring fire cover 300 is in communication with another end of the gas channel 103. The disturbance channel 119 is the above-mentioned gas homogenization portion.

[0060] With reference to FIG. 8 to FIG. 11, in the burner according to the present disclosure, the gas distributor 100 of the burner includes the gas passage 102, the gas inlet channel 118, and the gas channel 103. The gas mixing cavity of the inner ring fire cover 200 is in communication with the gas outlet end of the gas passage 102. The end of the gas channel 103 is in communication with the gas outlet end of the gas passage 102 through the gas inlet channel 118. The gas mixing cavity of the outer ring fire cover 300 is in communication with the other end of the gas channel 103. In this way, gas mixed with primary air is transmitted through the gas passage 102. A part of the transmitted gas is first transmitted to the gas mixing cavity of the inner ring fire cover 200 for burning in the inner ring fire cover 200, and another part of the transmitted gas is transmitted to the gas mixing cavity of the outer ring fire cover 300 through the gas channel 103 for burning in the outer ring fire cover 300.

[0061] With reference to FIG. 8 to FIG. 11, the disturbance channel 119 is formed at the gas distributor 100. The first end of the disturbance channel 119 is in communication with the middle of the gas passage 102, and the second end of the disturbance channel 119 is in communication with the gas channel 103. The disturbance angle is formed between the gas outlet direction of the disturbance channel 119 and the gas outlet direction of the gas inlet channel 118. In this way, the gas entering the gas passage 102 may partially flow into the disturbance channel 119 before being discharged from the gas outlet end of the gas passage 102. Therefore, gas volume of the gas mixing cavity of can be reduced to decrease a load of the inner ring fire cover 200 and balance the gas inflow volume of the inner ring fire cover 200 and the gas inflow volume of the outer ring fire cover 300. At the same time, when gas discharged from the second end of the gas passage 102 and gas discharged from the gas inlet channel 118 meet in a gas inlet cavity, a swirling flow region is formed to increase disturbance. In this way, the gas can be easily mixed with primary air. Thus, the burning is more sufficient to reduce the CO emissions. As a result, the practicability is good.

[0062] FIG. 12 is a schematic structural diagram of a gas distributor illustrated in FIG. 8. With reference to FIG. 12, the gas distributor 100 includes an inner ring gas inlet portion 104, 104 which may generally be in a cylindrical shape. The inner ring gas inlet portion 104 is provided with the gas passage 102 that penetrates on the axial direction of the inner ring gas inlet portion 104, i.e., the burner is disposed vertically when in use. A bottom end of the gas passage 102 is a gas inlet end connected to an ejector pipe of a stove head. The gas mixed with the primary air may be transmitted to the gas passage 102 through the ejector pipe of the stove head and discharged from a top end (i.e., the gas outlet end) of the gas passage 102, i.e., a single-nozzle updraft burner is formed.

[0063] With reference to FIG. 12, the gas distributor 100 further includes an enclosing plate 112 disposed at a circumferential surface of the inner ring gas inlet portion 104. The enclosing plate 112 has a through hole penetrating the inner ring gas inlet portion 104. The inner ring gas inlet portion 104 includes a first cylinder body 1041 and a second cylinder body 1042 that are coaxially arranged. A bottom of the first cylinder body 1041 may be integrally formed in the through hole of the enclosing plate 112, and the second cylinder body 1042 may be integrally formed at the bottom of the first cylinder body 1041. That is, the first cylinder body 1041 is located above the enclosing plate 112, and the second cylinder body 1042 is formed below the enclosing plate 112. The second cylinder body 1042 has a diameter slightly smaller than a diameter of the first cylinder body 1041. A second through hole 1044 is axially formed at the second cylinder body 1042, and a first through hole 1043 is axially formed at the first cylinder body 1041. The first through hole 1043 is in communication with the second through hole 1044 to form the above-mentioned gas passage 102.

[0064] The second through hole 1044 may be in a cylindrical shape, and the first through hole 1043 is in a conical shape. An inner diameter of a bottom end of the first through hole 1043 is consistent with an inner diameter of a bottom of the second through hole 1044, and an inner diameter of a top end of the first through hole 1043 is greater than an inner diameter of a bottom of the first through hole 1043. In this way, an ejection effect of the gas mixed with the primary air can be improved. In other embodiments, the inner diameter of the second through hole 1044 may be consistent with the inner diameter of the first through hole 1043. The second through hole 1044 is connected to the ejector pipe of the stove head. The gas mixed with the primary air may be transmitted into the gas passage 102 containing the second through hole 1044 and the first through hole 1043 through the ejector pipe of the stove head and discharged from the top end of the first through hole 1043.

[0065] A plurality of disturbance channels 119 may be arranged at intervals around an axial direction of the inner ring gas inlet portion 104, to improve homogenization of the gas discharged from the disturbance channels 119, and to further improve burning efficiency.

[0066] With reference to FIG. 12, the first end of the disturbance channel 119 is in communication with the middle of the gas passage 102, and the second end of the disturbance channel 119 penetrates the circumferential surface of the inner ring gas inlet portion 104. That is, the disturbance channel 119 is inclined upwards.

[0067] The first end of the disturbance channel 119 may be formed at an inner wall of the second through hole 1044 of the second cylinder body 1042, i.e., the first end of the disturbance channel 119 is located below the enclosing plate 112. The second end of the disturbance channel 119 is may be formed at an outer circumferential surface of the first cylinder body 1041, i.e., the second end of the disturbance channel 119 is located above the enclosing plate 112. That is, the second end of the disturbance channel 119 is higher than the first end of the disturbance channel 119. In other embodiments, each disturbance channel 119 may also be located above the enclosing plate 112. That is, a first end of the disturbance channel 119 is formed at an inner wall of a first through hole 1043 of a first cylinder body 1041, and a second end of the disturbance channel 119 is formed at an outer circumferential surface of the first barrel 1041. The disturbance channel 119 may be reasonably formed based on an exemplary situation, which is not limited herein.

[0068] It should be noted that the disturbance channel 119 in the embodiments of the present disclosure may also have a hollow cavity structure. That is, the disturbance channel 119 divides the inner ring gas inlet portion 104 into an upper portion and a lower portion by, and a gap between the upper portion and the lower portion is the disturbance channel 119. In this case, the upper portion of the inner ring gas inlet portion 104 may be connected to the lower portion of the inner ring gas inlet portion 104 by connection posts arranged at intervals.

[0069] With reference to FIG. 8 and FIG. 11, the gas mixing cavity of the inner ring fire cover 200 has a gap with the inner ring gas inlet portion 104, and the gap between the gas mixing cavity of the inner ring fire cover 200 and the inner ring gas inlet portion 104 is located above the inner ring gas inlet portion 104 and limited to form the above-mentioned inlet channel 118.

[0070] With reference to FIG. 11, the gas inlet channel 118 has a first end in communication with the gas outlet end of the gas passage 102 and a second end in communication with the gas channel 103. The first end of the gas inlet channel 118 is higher than the second end of the gas inlet channel 118, and the second end of the gas inlet channel 118 is higher than the second end of the disturbance channel 119. That is, the gas inlet channel 118 is inclined downwards and cooperates with the disturbance channel 119 inclined upwards. In this way, when gas discharged from the second end of the gas passage 102 and gas discharged from the gas inlet channel 118 meet in the gas inlet cavity, the swirling flow region is formed to increase the disturbance. Therefore, the gas can be easily mixed with the primary air. Thus, the burning is more sufficient to reduce the CO emissions.

As a result, the practicability is good.

[0071] An angle between a central axis of the gas inlet channel 118 and a center line of the disturbance channel 119 preferably ranges from 30° to 60°, i.e., the disturbance angle between the gas outlet direction of the disturbance channel 119 and the gas outlet direction of the gas inlet channel 118 ranges from 30° to 60°, which can have a good disturbance effect. The angle between the two may also be adjusted based on an actual situation, which is not limited in the embodiments of the present disclosure.

[0072] FIG. 13 is a schematic diagram of fitting of an inner ring fire cover and an outer ring fire cover in FIG. 8, and FIG. 14 is a schematic structural diagram of FIG. 13 from another perspective. With reference to FIG. 13 and FIG. 14, the inner ring fire cover 200 may be connected above the enclosing plate 112 through a plurality of first connection posts 600 to realize fitting of the inner ring fire cover 200 on the gas distributor 100.

[0073] With reference to FIG. 12 to FIG. 14, in some embodiments, the first connection post 600 may be integrally formed at a bottom of the inner ring fire cover 200, and a bottom of the first connection post 600 may be connected to the first connection hole 113 formed on the enclosing plate 112.

[0074] With reference to FIG. 11 and FIG. 13, an outer side wall of the inner ring fire cover 200 may extend to the enclosing plate 112, and therefore the inner ring fire cover 200, the inner ring gas inlet portion 104, and the enclosing plate 112 enclose a disturbance cavity with a top opening. Thus, the second end of each disturbance channel 119 is in communication with the disturbance cavity, and gas mixed with the primary air discharged from the second end of each disturbance channel 119 flows to the disturbance cavity. At the same time, gas mixed with the primary air discharged from the outlet end of the gas passage 102 flows to the disturbance cavity through the open top of the disturbance cavity. The two streams of gas converge in the disturbance cavity to form the swirling flow region that increases the disturbance. In this way, the gas can be easily mixed with the primary air. Therefore, the burning is more sufficient to reduce the CO emissions. Thus, the practicability is good.

[0075] With reference to FIG. 11, FIG. 12 and FIG. 13, the inner ring fire cover 200 is in communication with the outer ring fire cover 300 through the plurality of cavities 500, and the gas channel 103 is formed in each of the plurality of cavities 500. A gas vent is formed at an end of each gas channel 103 connected to the inner ring fire cover 200, and therefore each gas channel 103 is in communication with the disturbance cavity. The two streams of gas are distributed to each gas channel 103 through the gas vent after being disturbed and converging in the disturbance cavity, and then are transmitted into the gas mixing cavity of the outer ring fire cover 300 for the burning in the outer ring fire cover 300.

[0076] With reference to FIG. 11, FIG. 12, and FIG. 13, the gas distributor 100 further includes a plurality of sup-

port plates 115, which may be arranged at intervals on an outer circumferential surface of the inner ring gas inlet portion 104 by means of the enclosing plate 112. A bottom of each cavity 500 has an opening and is sealed by a corresponding support plate. The cavity 500 and the corresponding support plate 115 form the gas channel 103 with two open ends. An opening facing towards the inner ring fire cover 200 is the above-mentioned gas vent, and the other opening facing towards the outer ring fire cover 300 is the above-mentioned gas outlet. The two streams of gas are distributed to each gas channel 103 through the gas vent of each gas channel 103 after being disturbed and converging in the disturbance cavity, and then are transmitted into the gas mixing cavity of the outer ring fire cover 300 through the gas outlet of each gas channel 103 for the burning of the outer ring fire cover 300.

[0077] It is necessary for the support plate 115 to have a thickness, and the bottom of each cavity 500 is snapped at both sides of the corresponding support plate 115 in a width direction of the support plate 115, to improve seal performance of a connection between the bottom of the cavity 500 and the corresponding support plate 115.

[0078] With reference to FIG. 11, FIG. 12 and FIG. 13, a lug plate 116 is disposed at each of the two sides of an outer end of each support plate 115 in the width direction of the support plate 115, and a bottom of the gas mixing cavity of the outer ring fire cover 300 may be fixed on the lug plate 116 through a second connection post 400, to realize fitting of the outer ring fire cover 300 on the gas distributor 100.

[0079] With reference to FIG. 13 and FIG. 14, a top of the second connection post 400 may be integrally connected to the bottom of the gas mixing cavity of the outer ring fire cover 300, and the second connection post 400 may pass through the second connection hole 117 formed at the lug plate 116.

[0080] Each lug plate 116, each support plate 115, the enclosing plate 112, and the inner ring gas inlet portion 104 that are composed of the gas distributor 100 may be integrally formed to provide the gas distributor 100 with sufficient strength. Therefore, use reliability is improved.

[0081] Based on the same principle, the present disclosure further provides a gas stove. The gas stove mainly includes a panel and the above-mentioned burner, a cookware bracket for placing cookware, other necessary accessories, etc. Since the embodiments herein do not improve accessories such as the panel and the bracket of the gas stove, the exemplary structures thereof can refer to the existing disclosure, and other undetailed structures of the gas stove can also refer to the relevant disclosure in the related art, an exemplary content of which is not described herein.

[0082] The above-mentioned embodiments are preferred embodiments of the present disclosure, and are only used to facilitate the description of the present disclosure, and are not intended to limit the present disclosure in any form. Partial changes or modifications in the

equivalent embodiments made to the disclosed technical content of the present disclosure by those skilled in the art, within the scope of the technical features mentioned in the present disclosure, and without departing from the technical scope of the present disclosure, are still considered as falling within the scope of the technical features of the present disclosure.

Claims

1. A burner, comprising:

a gas distributor having a gas channel, a gas passage, and a gas homogenization portion;
an inner ring fire cover disposed at the gas distributor; and
an outer ring fire cover disposed at the gas distributor, a gas mixing cavity of the inner ring fire cover being in communication with a gas outlet end of the gas passage, a gas mixing cavity of the outer ring fire cover being in communication with the gas mixing cavity of the inner ring fire cover through the gas channel, and the gas passage being in communication with the gas channel through the gas homogenization portion, which balances gas quantity of the gas mixing cavity of the outer ring fire cover and gas quantity of the gas mixing cavity of the inner ring fire cover.

2. The burner according to claim 1, wherein the gas homogenization portion comprises a flow guide groove located at the gas channel and the gas passage being in communication with the gas channel through the flow guide groove.

3. The burner according to claim 2, wherein the gas distributor comprises an inner ring gas inlet portion provided with the gas passage in an axial direction of the inner ring gas inlet portion and provided with a plurality of flow guide grooves arranged at intervals along an outer circumferential surface of the inner ring gas inlet portion.

4. The burner according to claim 3, wherein a ratio of an inner diameter of an annular region formed by the plurality of flow guide grooves to a diameter of the gas passage is greater than or equal to 1.5: 1.

5. The burner according to claim 3, wherein the inner ring gas inlet portion comprises:

a first cylinder body having the gas passage that penetrates in an axial direction of the first cylinder body; and
a second cylinder body connected to an outer circumferential surface of the first cylinder body,

a height of a top of the second cylinder body being lower than a height of a top of the first cylinder body, and each of the plurality of flow guide grooves extending from the top of the first cylinder body to a middle of an outer circumferential surface of the second cylinder body.

6. The burner according to claim 5, wherein the top of the first cylinder body has a guide tangent plane corresponding to the flow guide groove, a top of the guide tangent plane being located at a middle of the top of the first cylinder body, and a bottom of the guide tangent plane being located at a top of the corresponding flow guide groove.

7. The burner according to claim 6, wherein the inner ring gas inlet portion further comprises a transition cylinder body located between the outer circumferential surface of the first cylinder body and the top of the second cylinder body, a top of the transition cylinder body having a gradually decreasing height from inside to outside.

8. The burner according to any one of claims 3 to 7, wherein:

the gas mixing cavity of the inner ring fire cover has a gap with the inner ring gas inlet portion, the gap being located above the top of the inner ring gas inlet portion; and
the inner ring fire cover is in communication with the outer ring fire cover through a plurality of cavities, each of the plurality of cavities having the gas channel, the plurality of flow guide grooves being disposed correspondingly to the plurality of cavities, and the flow guide groove being disposed in the gas channel of the corresponding cavity.

9. The burner according to claim 1, wherein:
the gas distributor further has a gas inlet channel and a disturbance channel, a gas inlet end of the gas channel being in communication with the gas outlet end of the gas passage through the gas inlet channel, a first end of the disturbance channel being in communication with and located at a middle of the gas passage, a second end of the disturbance channel being in communication with the gas channel, a disturbance angle being formed between a gas outlet direction of the disturbance channel and a gas outlet direction of the gas inlet channel, and the disturbance channel is configured as the gas homogenization portion.

10. The burner according to claim 9, wherein the gas distributor comprises an inner ring gas inlet portion provided with the gas passage that penetrates in an axial direction of the inner ring gas inlet portion.

11. The burner according to claim 10, wherein a plurality of disturbance channels are arranged at intervals around the axial direction of the inner ring gas inlet portion.
12. The burner according to claim 11, wherein:
a first end of the disturbance channel is in communication with and located at the middle of the gas passage; and
a second end of the disturbance channel penetrates a circumferential surface of the inner ring gas inlet portion.
13. The burner according to claim 12, wherein the second end of the disturbance channel is higher than the first end of the disturbance channel.
14. The burner according to claim 13, wherein the gas inlet channel has a first end in communication with the gas outlet end of the gas passage and a second end in communication with the gas channel, the first end of the gas inlet channel being higher than the second end of the gas inlet channel, and the second end of the gas inlet channel being higher than the second end of the disturbance channel.
15. The burner according to claim 14, wherein the gas mixing cavity of the inner ring fire cover has a gap with the inner ring gas inlet portion, the gap between the gas mixing cavity of the inner ring fire cover and the inner ring gas inlet portion being located above the inner ring gas inlet portion and limited as the gas inlet channel.
16. The burner according to claim 15, wherein:
the gas distributor further comprises an enclosing plate disposed at the circumferential surface of the inner ring gas inlet portion; and
an outer side wall of the inner ring fire cover extends to the enclosing plate, the inner ring fire cover, the inner ring gas inlet portion, the enclosing plate enclose a disturbance cavity having an open top, and the second end of the disturbance channel being in communication with the disturbance cavity through the disturbance cavity.
17. The burner according to claim 16, wherein the inner ring fire cover is in communication with the outer ring fire cover through a plurality of cavities, the plurality of cavities having gas channels in communication with the plurality of disturbance channels through the disturbance cavity.
18. The burner according to claim 8 or 17, wherein the gas distributor further comprises a plurality of support plates arranged at intervals at an outer circumferential surface of the inner ring gas inlet portion, a bottom of each of the plurality of cavities having an opening and being sealed by a corresponding support plate, and the cavity and the corresponding support plate forming the gas channel with two open ends.
19. A gas stove, comprising:
the burner according to any one of claims 1 to 18.

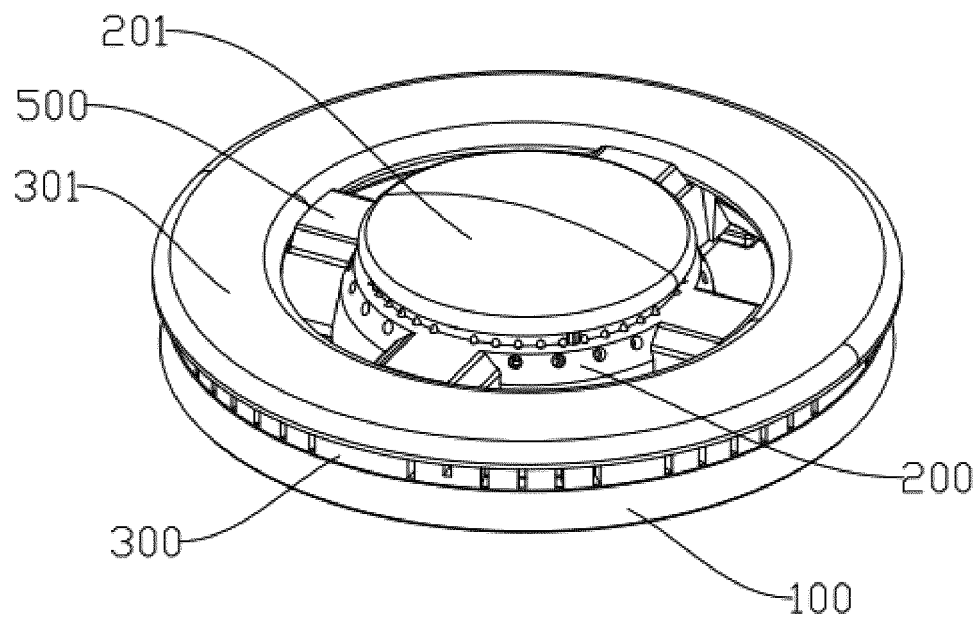


FIG. 1

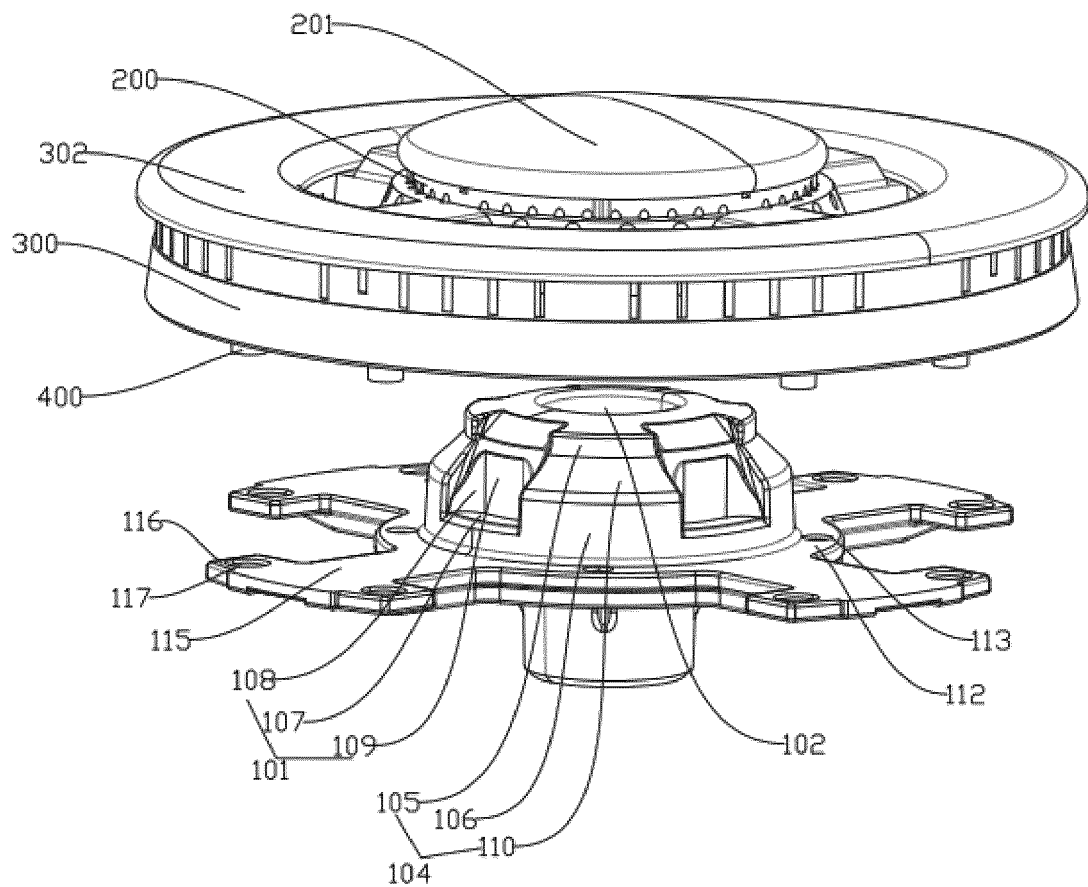


FIG. 2

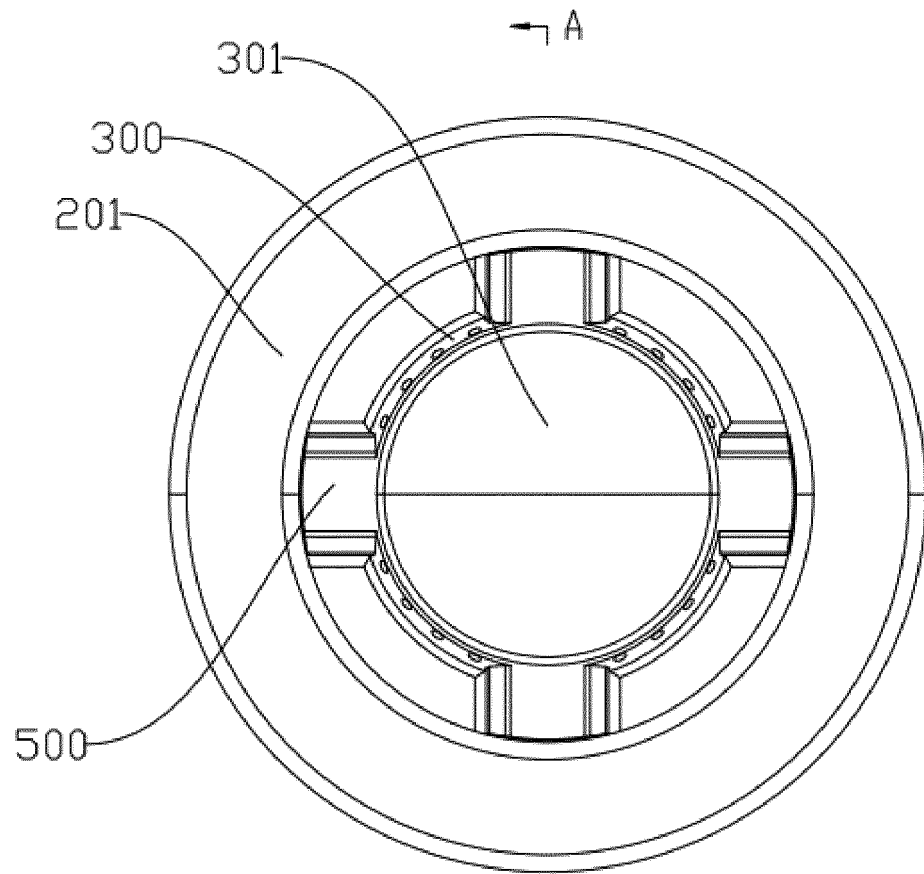


FIG. 3

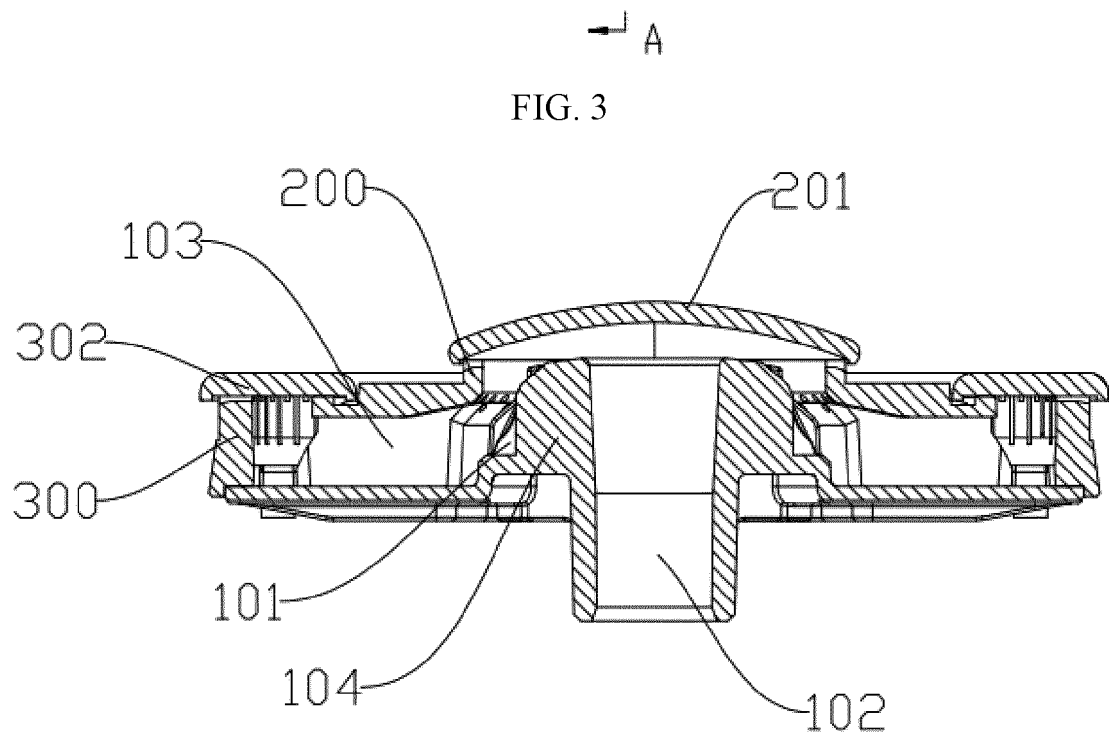


FIG. 4

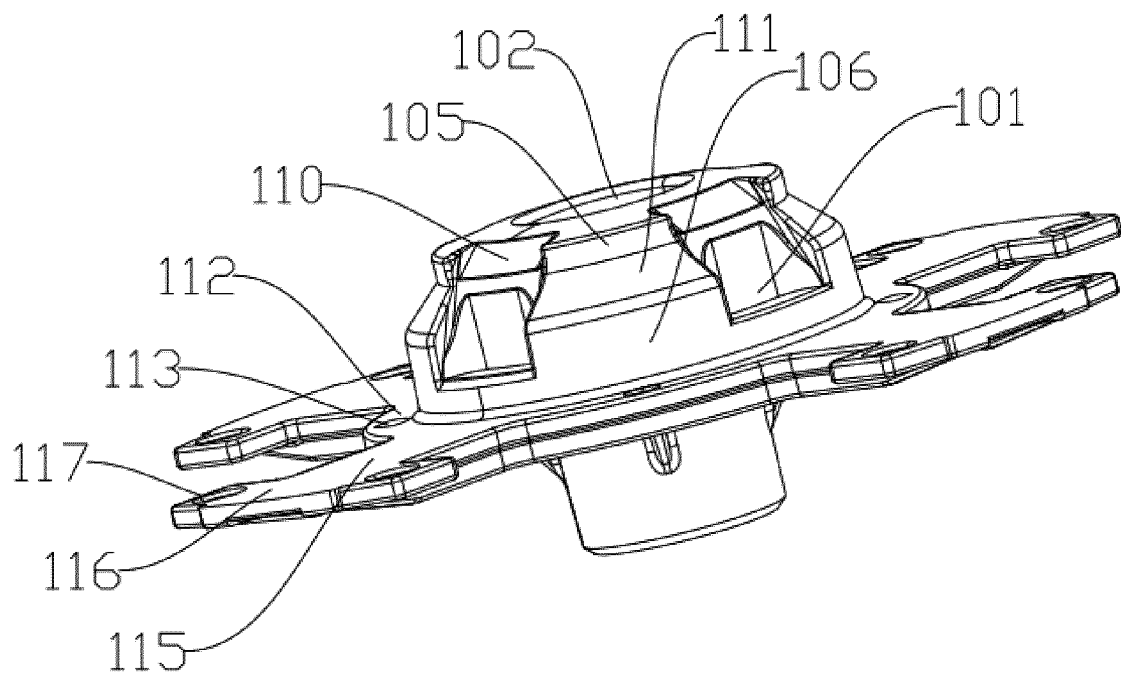


FIG. 5

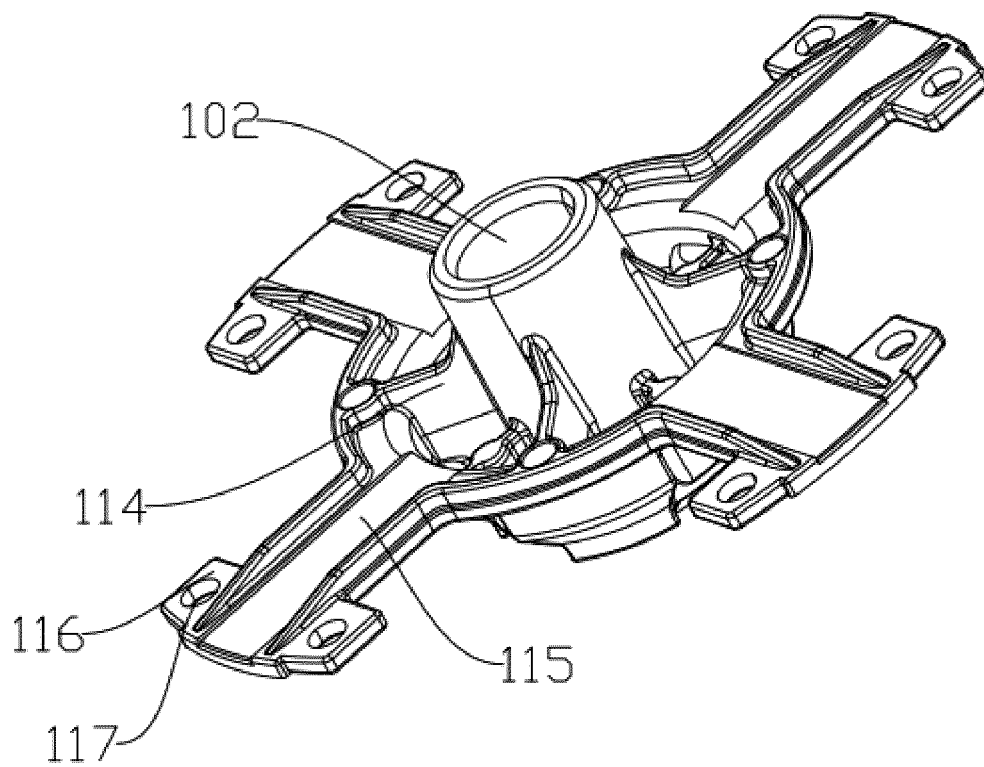


FIG. 6

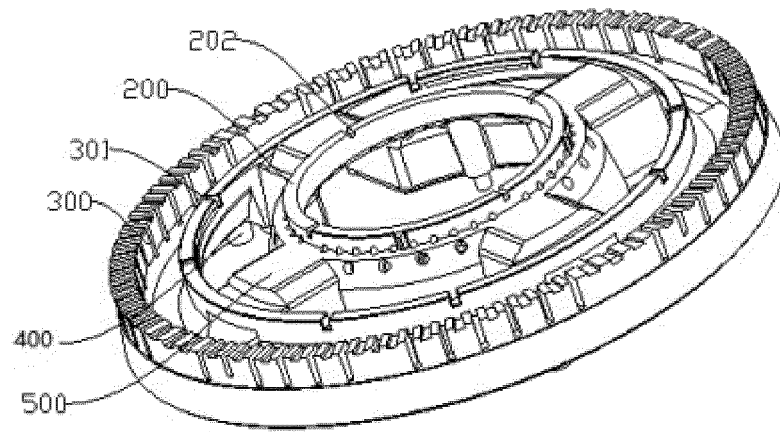


FIG. 7

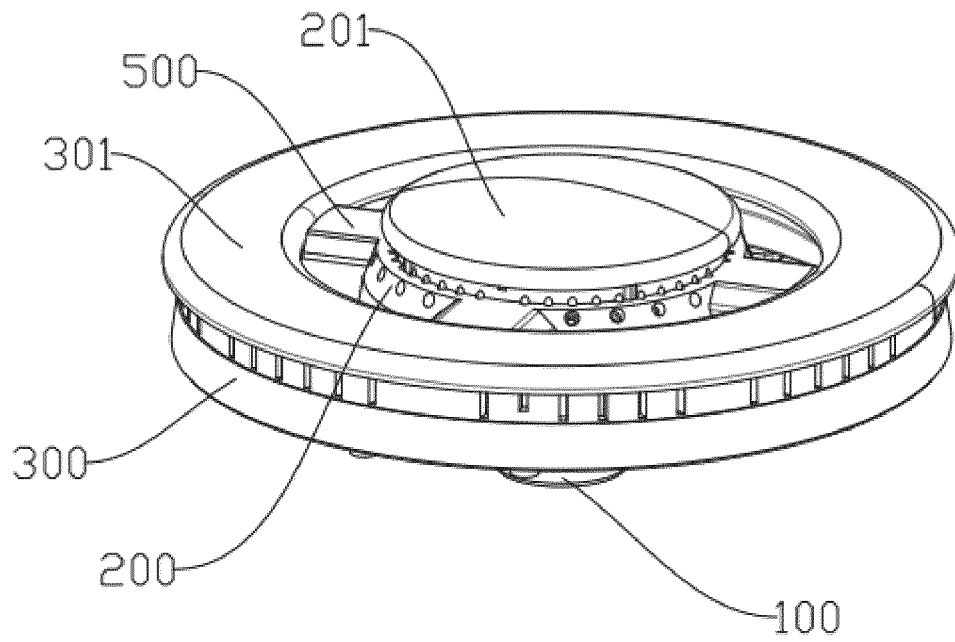


FIG. 8

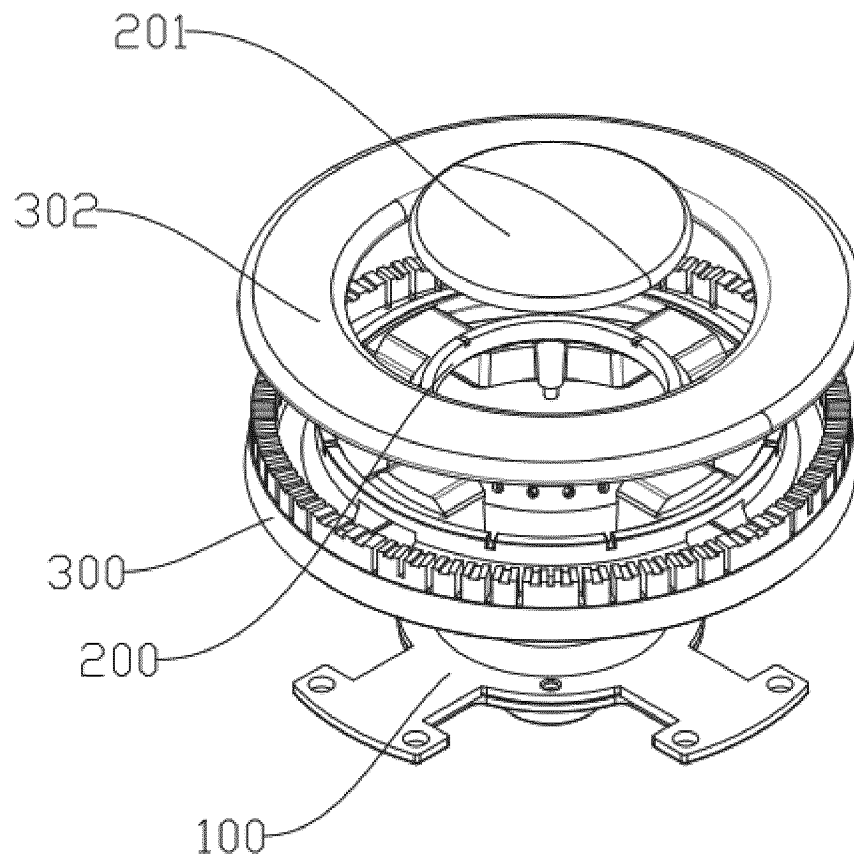


FIG. 9

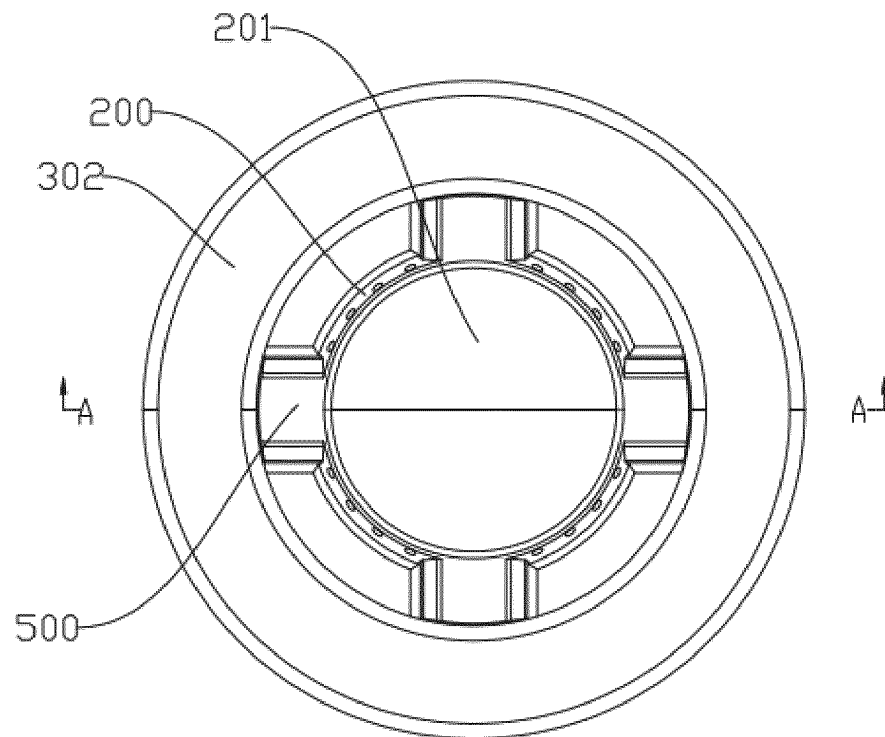


FIG. 10

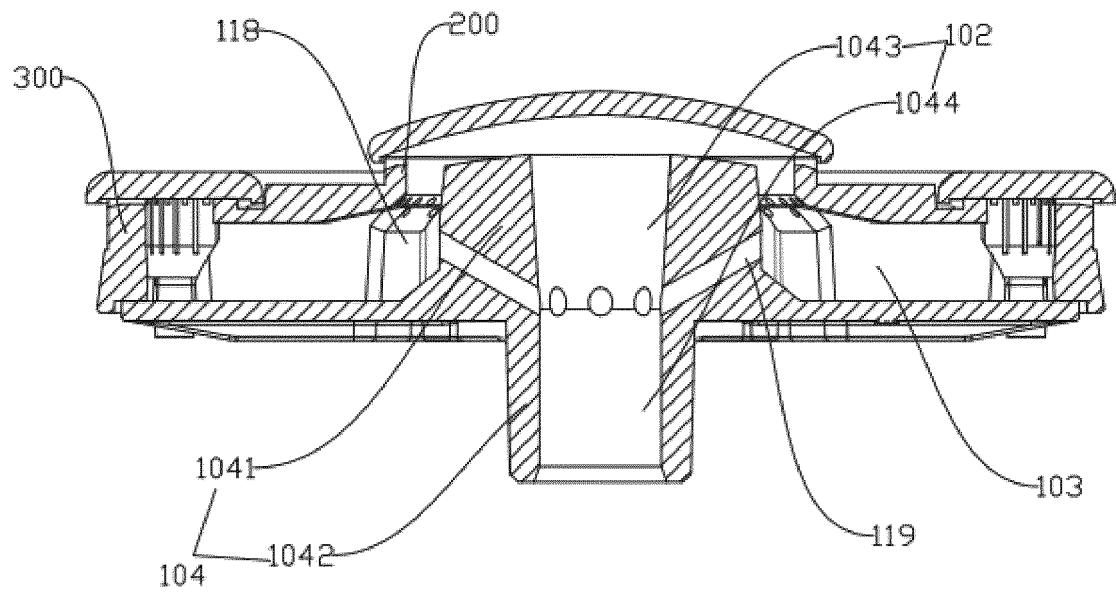


FIG. 11

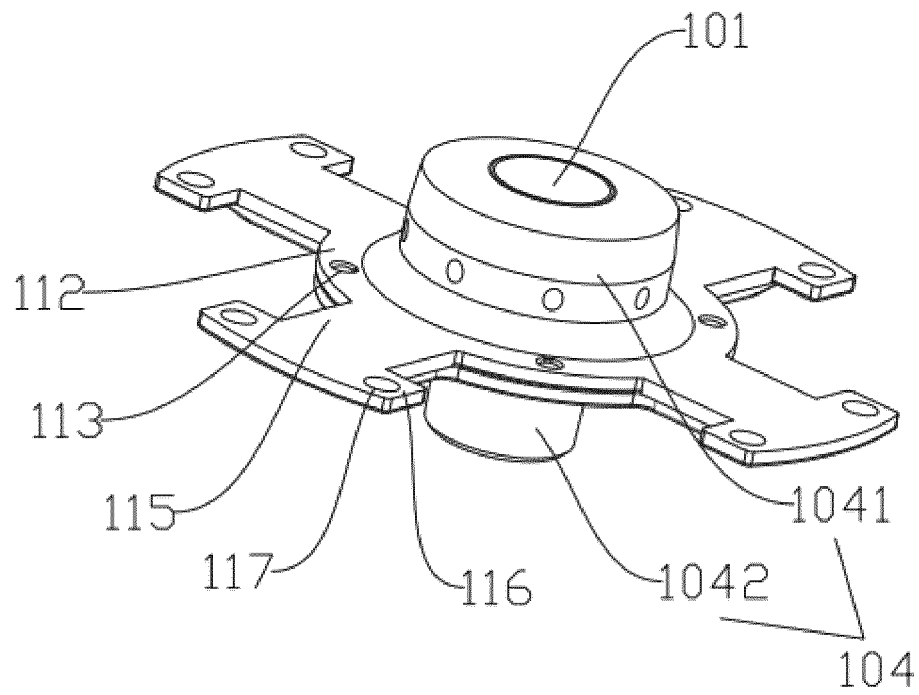


FIG. 12

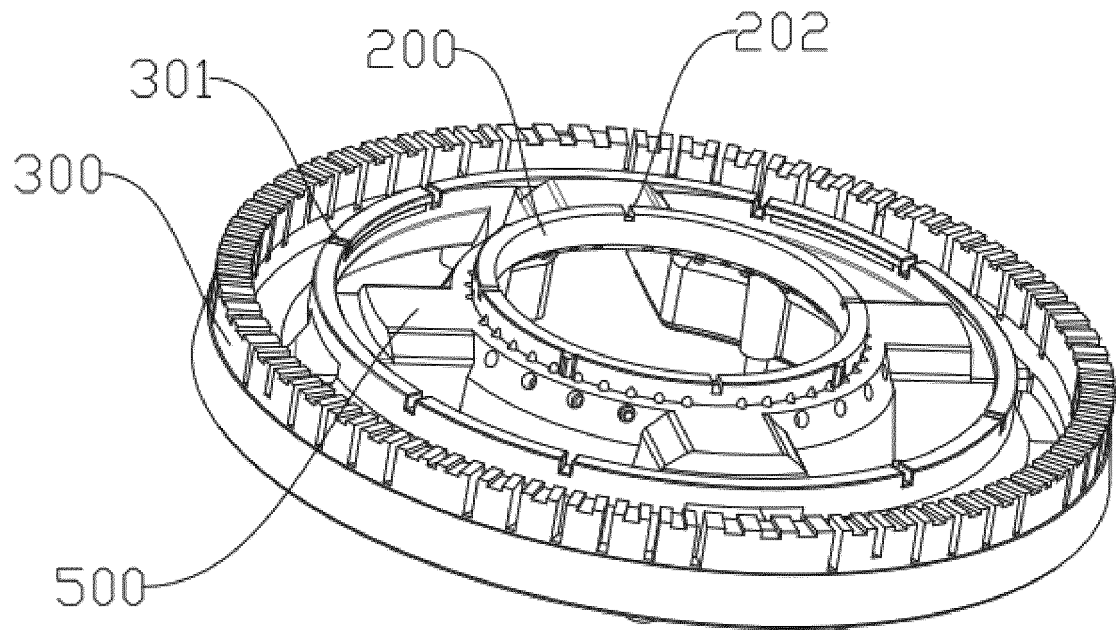


FIG. 13

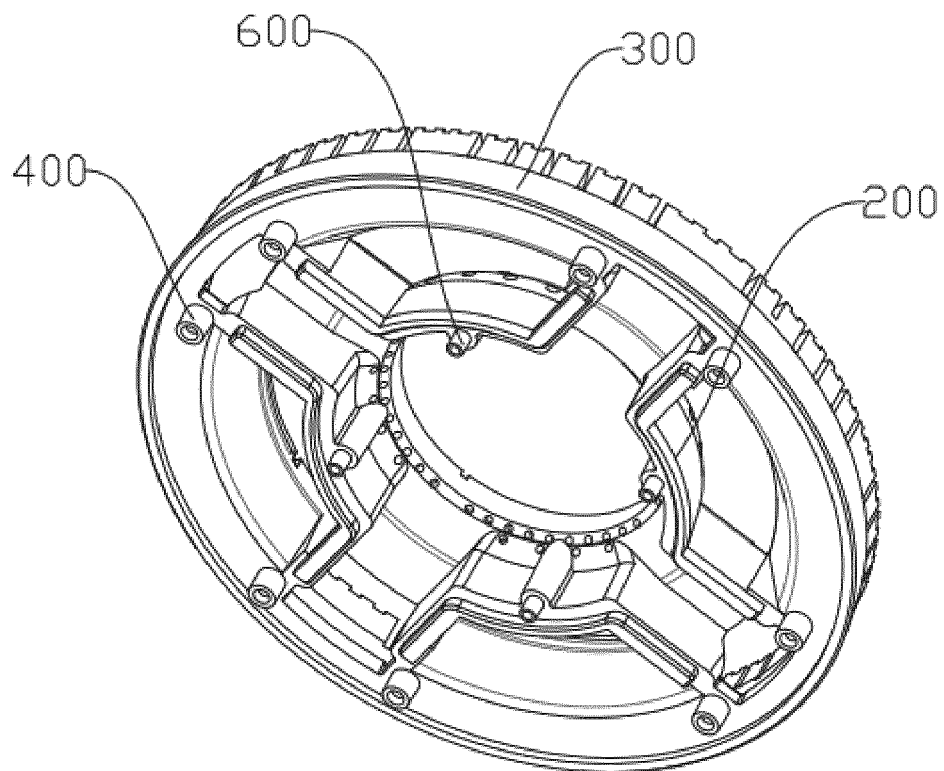


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/083295

A. CLASSIFICATION OF SUBJECT MATTER

F24C 3/08(2006.01)i; F24C 3/00(2006.01)i; F23D 14/08(2006.01)i; F23D 14/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F23D14;F24C3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT; WPABSC; WPABS; CJFD; Patentics: 美的, 燃气, 内环, 外环, 通道, 气道, 流道, 进气, 混气, 混合, 盖, 上进风, 中心燃气, 中间燃气, 引射, 分气, 分火, 分配, 均匀, 均衡, 平衡, 平均, burner, inner, outer, ring, nozzle?, flame, cover?, channel, gap, tube?, mix, mixing, cavity

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 113864825 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 31 December 2021 (2021-12-31) description, paragraphs 56-88, and figures 1-7	1, 19
A	CN 110762525 A (NINGBO FOTILE KITCHENWARE CO., LTD.) 07 February 2020 (2020-02-07) entire document	1-19
A	CN 104713085 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 17 June 2015 (2015-06-17) entire document	1-19
A	CN 208764924 U (NINGBO FENGTEG GAS APPLIANCE CO., LTD.) 19 April 2019 (2019-04-19) entire document	1-19
A	CN 110440248 A (NINGBO FOTILE KITCHENWARE CO., LTD.) 12 November 2019 (2019-11-12) entire document	1-19

☒ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of mailing of the international search report
12 October 2022	28 October 2022
Name and mailing address of the ISA/CN	Authorized officer
China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China	
Facsimile No. (86-10)62019451	Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/083295

5

10

15

20

25

30

35

40

45

50

55

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 212537835 U (ZHEJIANG LAJOSON ELECTRIC CO., LTD.) 12 February 2021 (2021-02-12) entire document	1-19
A	WO 2016141642 A1 (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 15 September 2016 (2016-09-15) entire document	1-19
A	WO 2022007463 A1 (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD.) 13 January 2022 (2022-01-13) entire document	1-19

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/083295

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	113864825	A	31 December 2021	None			
CN	110762525	A	07 February 2020	None			
CN	104713085	A	17 June 2015	None			
CN	208764924	U	19 April 2019	None			
CN	110440248	A	12 November 2019	None			
CN	212537835	U	12 February 2021	None			
WO	2016141642	A1	15 September 2016	CN	104713084	A	17 June 2015
WO	2022007463	A1	13 January 2022	None			

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 202210096629 [0001]
- CN 202210181787 [0001]
- CN 202220427694 [0001]