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(54) **BURNER ASSEMBLY AND GAS STOVE**

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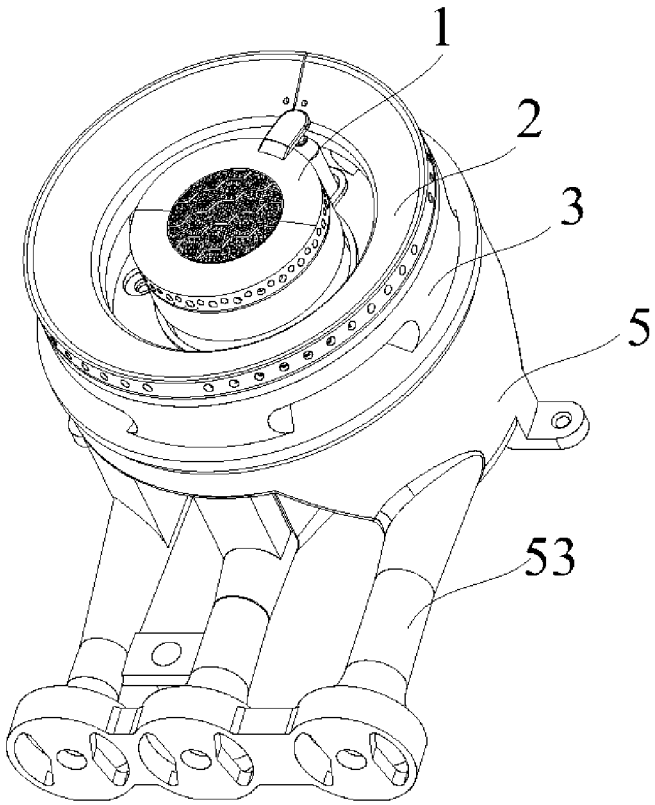
(57) **ABSTRACT**

Disclosed are a burner assembly and a gas stove. The burner assembly includes a burner, a gas distribution disk mounted on the burner, and a flexible metal seal ring located between the burner and the gas distribution disk, and the bottom of the gas distribution disk is provided with a first fitting surface, the top of the burner is provided with a second fitting surface, the flexible metal seal ring is provided with a first surface and a second surface opposite to the first surface, the first surface is in seal-fit with the first fitting surface, and the second surface is in seal-fit with the second fitting surface of the burner. The gas stove comprises a panel, a bottom shell and the burner assembly. The burner assembly can prevent gas leakage during operation of the gas stove, thereby improving the safety of the gas stove.



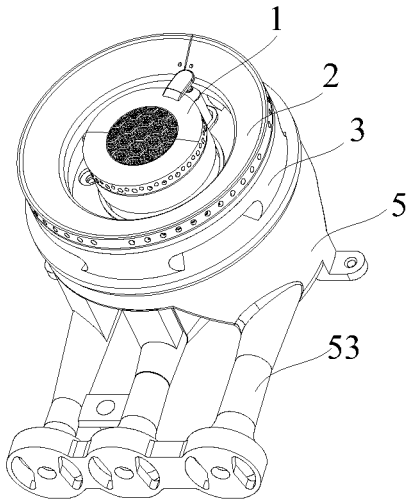



Fig. 1

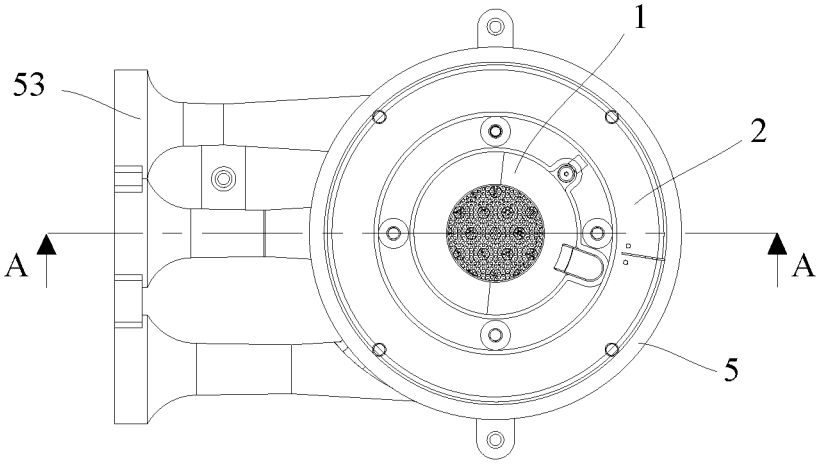



Fig. 2

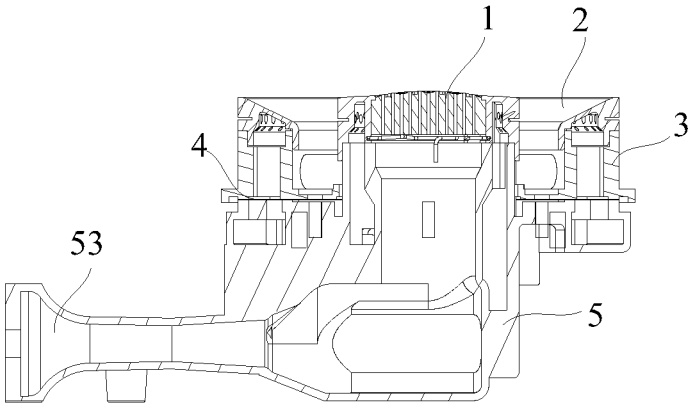



Fig. 3

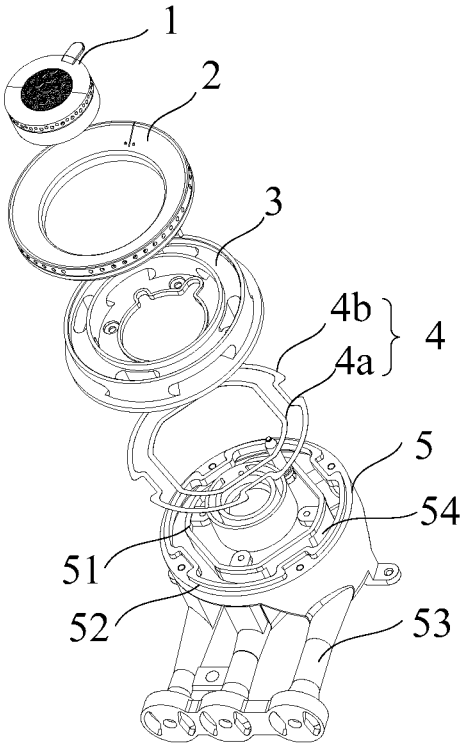



Fig. 4

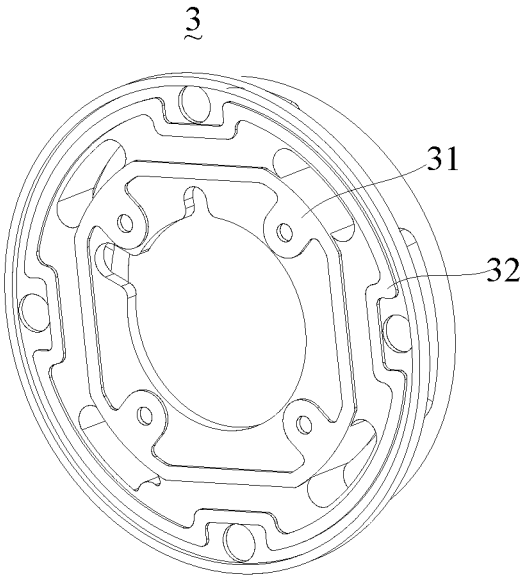



Fig. 5

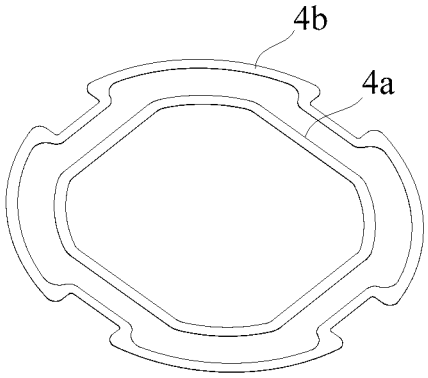



Fig. 6

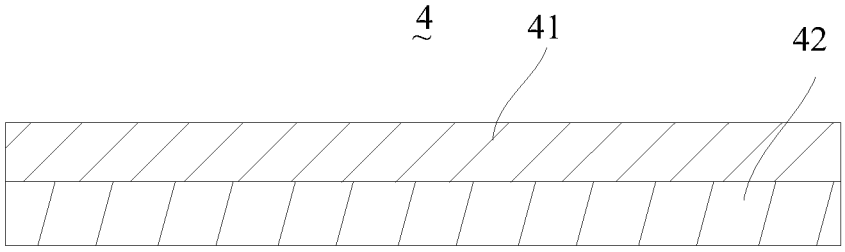



Fig. 7

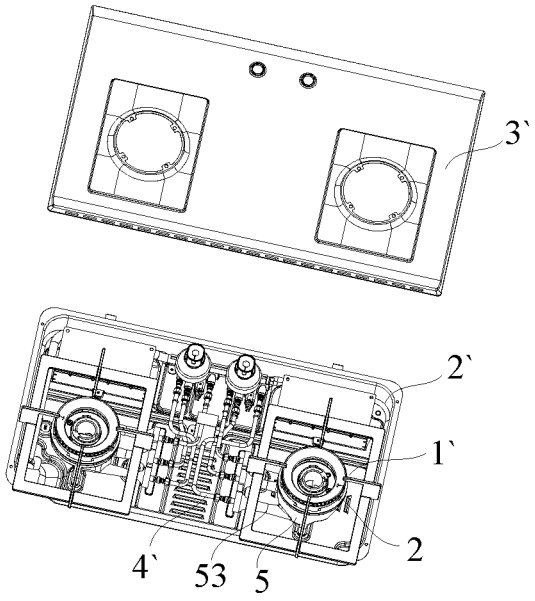



Fig. 8

# BURNER ASSEMBLY AND GAS STOVE

## FIELD

**[0001]** The present invention relates to a technology of gas stoves, and more particularly to a burner assembly and a gas stove.

## BACKGROUND

**[0002]** A burner assembly in the prior art is generally constituted by a burner, a gas distribution disk disposed to the burner and a burner cap assembly mounted to the gas distribution disk. Since the burner and the gas distribution disk each are required to be resistant to high temperature, fitting surfaces of the burner and the gas distribution disk are generally subject to a finely planishing treatment, so as to maintain flatness of the fitting surfaces of the two, thereby effectively preventing gas leakage. However during the practical processing, due to a machining error, the fitting surfaces of the burner and the gas distribution disk cannot be sealed completely. Moreover during the practical processing, the burner and the gas distribution disk expand when heated, and the fitting surfaces of the burner and the gas distribution disk may be partially separated, such that it is difficult to ensure reliability of the sealing between the burner and the gas distribution disk, thereby resulting in a gas leakage problem existing in the gas stove.

## SUMMARY

**[0003]** A main objective of the present invention is to provide a burner assembly, which seeks to improve reliability of sealing between a burner and a gas distribution disk, and prevent gas leakage in the burner.

**[0004]** In order to achieve the above objective, a burner assembly provided by the present invention includes a burner, a gas distribution disk mounted to the burner, and a flexible metal sealing ring located between the burner and the gas distribution disk. The gas distribution disk has a first fitting surface on a bottom portion, and the burner has a second fitting surface on a top portion. The flexible metal sealing ring has a first surface and a second surface opposite to the first surface, the first surface is seal-fitted with the first fitting surface of the gas distribution disk, and the second surface is seal-fitted with the second fitting surface of the burner.

**[0005]** In one embodiment, a circumferential edge of the top portion of the burner is provided with a ring-shaped boss, and an enclosure wall located in the ring-shaped boss is provided to the top portion of the burner and extends upwards.

**[0006]** The bottom portion of the gas distribution disk is provided with a first flange corresponding to the ring-shaped boss, and the bottom portion of the gas distribution disk is provided with a second flange corresponding to enclosure wall.

**[0007]** The flexible metal sealing ring includes a first sealing ring and a second sealing ring, a first surface of the first sealing ring abutting against the first flange, a second surface of the first sealing ring abutting against a top part of the ring-shaped boss, a first surface of the second sealing ring abutting against the second flange, and a second surface of the second sealing ring abutting against a top part of the enclosure wall.

**[0008]** In one embodiment, the first sealing ring is fixed to the first flange, and the second sealing ring is fixed to the second flange.

**[0009]** In one embodiment, the first surface of the first sealing ring adheres to the first flange or is screwed to the first flange through a screw, and the second surface of the first sealing ring adheres to the top part of the ring-shaped boss; the first surface of the second sealing ring adheres to the second flange or is screwed to the second flange through a screw, and the second surface of the second sealing ring adheres to the top part of the enclosure wall.

**[0010]** In one embodiment, the second surface of the first sealing ring is provided with an adhesive backing layer bonding to the top part of the ring-shaped boss, and the second surface of the second sealing ring is provided with an adhesive backing layer bonding to the top part of the enclosure wall.

**[0011]** In one embodiment, a material of the flexible metal sealing ring is aluminum or copper.

**[0012]** In one embodiment, a thickness of the flexible metal sealing ring is 0.1-0.5 mm.

**[0013]** In one embodiment, the flexible metal sealing ring is provided with a first material layer and a second material layer in a direction from the first surface to the second surface, the material of the first material layer being as same as that of the gas distribution disk, the material of the second material layer being as same as that of burner, and the first material layer and the second material layer being formed integrally.

**[0014]** In one embodiment, the materials of the gas distribution disk and the first material layer are aluminum or copper, the materials of the burner and the second material layer are iron.

**[0015]** A gas stove is further provided by the present invention and includes a panel, a base shell and a burner assembly. The panel covers the base shell and defines, with the base shell, an accommodation space for accommodating the burner assembly. The burner assembly includes a burner, a gas distribution disk mounted to the burner, and a flexible metal sealing ring located between the burner and the gas distribution disk; the gas distribution disk has a first fitting surface on a bottom portion, and the burner has a second fitting surface on a top portion; the flexible metal sealing ring has a first surface and a second surface opposite to the first surface, the first surface is seal-fitted with the first fitting surface of the gas distribution disk, and the second surface is seal-fitted with the second fitting surface of the burner.

**[0016]** In the technical solutions of the present invention, the flexible metal sealing ring is additionally disposed between the burner and the gas distribution disk. The first surface of the flexible metal sealing ring abuts against the first fitting surface of the gas distribution disk, and the second surface of the flexible metal sealing ring abuts against the second fitting surface of the burner, thereby achieving a better sealing effect. When the burner assembly operates, the gas distribution disk and the burner each are heated to expand, and since the flexible metal sealing ring has better thermal elasticity, the first fitting surface of the gas distribution disk expanded by heat is pressed on and closely fitted to the first surface of the flexible metal sealing ring, and the second fitting surface of the burner expanded by heat is pressed on and closely fitted to the second surface of the flexible metal sealing ring, such that the burner can be better seal-fitted with the gas distribution disk due to the thermal

elasticity of the flexible metal sealing ring, thereby effectively preventing gas leakage and achieving better safety.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0017]** In order to describe embodiments of the present invention or technical solutions in the prior art more clearly, the drawings necessary in the descriptions of the embodiments or the prior art will be briefly explained. Obviously, the drawings in the following description are just some embodiments of the present invention. To those skilled in the art, in the premise of no creative labor, other drawings can also be obtained according to structures illustrated in these drawings.

**[0018]** FIG. **1** is a schematic view of a burner assembly according to an embodiment of the present invention;

**[0019]** FIG. **2** is a top view of the burner assembly illustrated in FIG. **1**;

**[0020]** FIG. **3** is a schematic section view taken along A-A line of the burner assembly illustrated in FIG. **2**;

**[0021]** FIG. **4** is a schematic exploded view of the burner assembly illustrated in FIG. **1**;

**[0022]** FIG. **5** is a schematic view of a gas distribution disk illustrated in FIG. **4**;

**[0023]** FIG. **6** is a schematic view of a flexible metal sealing ring illustrated in FIG. **4**;

**[0024]** FIG. **7** is a schematic section view of the flexible metal sealing ring illustrated in FIG. **6**;

**[0025]** FIG. **8** is a schematic view of a gas stove according to an embodiment of the present invention.

## REFERENCE NUMERALS

**[0026]**

| Reference numeral | Object |
|---|---|
| 1 | Inner ring burner cap |
| 2 | Outer ring burner cap |
| 3 | Gas distribution disk |
| 31 | Second flange |
| 32 | First flange |
| 4 | Flexible metal sealing ring |
| 4a | Second sealing ring |
| 4b | First sealing ring |
| 41 | First material layer |
| 42 | Second material layer |
| 5 | Burner |
| 51 | Enclosure wall |
| 52 | Ring-shaped boss |
| 53 | Injection pipe |
| 54 | Gas mixing chamber |
| 1' | Burner assembly |
| 2' | Base shell |
| 3' | Panel |
| 4' | Gas pipe assembly |

**[0027]** Implementation of the objective, functional features and advantages of the present invention will be further described with reference to the drawings in combination with embodiments.

## DETAILED DESCRIPTION

**[0028]** Technical solutions in embodiments of the present invention will be clearly and completely described in combination with the drawings in the embodiments of the present invention in the followings. Obviously, the embodiments described are just a part of embodiments of the present invention, rather than all the embodiments. Based on the embodiments of the present invention, all the other embodiments obtained by the skilled in the art without the creative labors belong to the protection scope of the present invention.

**[0029]** It should be noted that, all the directional indications (such as "upper," "lower," "front," "rear," "left," "right,") in embodiments of the present invention are just to explain relative positional relation and movement conditions between respective components under a certain posture (as shown in the drawings). If the certain posture changes, the directional indications change correspondingly.

**[0030]** In addition, terms such as "first" and "second" are used herein for purposes of description and are not intended to indicate or imply relative importance or significance or to imply the number of indicated technical features. Thus, the feature defined with "first" and "second" may comprise one or more of this feature. Furthermore, technical solutions in respective embodiments may be mutual combined, and the combination may be on basis of that can be achieved by those skilled in the art. When the combinations of technical solutions appear to be mutually contradictory or cannot be achieved, the combinations of technical solutions should be deemed to be inexistent, and are not within the protection scope of the present invention.

**[0031]** A burner assembly is provided by the present invention.

**[0032]** Referring to FIG. **1**, FIG. **1** is a schematic view of a burner assembly according to an embodiment of the present invention; FIG. **2** is a top view of the burner assembly illustrated in FIG. **1**; FIG. **3** is a schematic section view taken along A-A line of the burner assembly illustrated in FIG. **2**; FIG. **4** is a schematic exploded view of the burner assembly illustrated in FIG. **1**.

**[0033]** Referring to FIG. **1**, in the present embodiment, the burner assembly includes a burner **5**, a gas distribution disk **3** mounted to the burner **5**, a burner cap assembly fixed to the gas distribution disk **3**, and a flexible metal sealing ring **4** located between the burner **5** and the gas distribution disk **3**. The gas distribution disk **3** has a first fitting surface on a bottom portion, and the burner **5** has a second fitting surface on a top portion. The flexible metal sealing ring **4** has a first surface and a second surface opposite to the first surface. When the burner **5** and the gas distribution disk **3** are heated to expand, the first surface is seal-fitted with the first fitting surface of the gas distribution disk **3**, and the second surface is seal-fitted with the second fitting surface of the burner. The above burner cap assembly can include an inner ring burner cap **1** and an outer ring burner cap **2**, or can include one burner cap. In the present embodiment, the burner cap includes the inner ring burner cap **1** and the outer ring burner cap **2**. The burner **5** introduces gas through an injection pipe **53**, and the injection pipe **53** is designed according to Venturi principle, which can increase an inlet velocity of the gas.

**[0034]** In the technical solutions of the present invention, the flexible metal sealing ring **4** is additionally disposed between the burner **5** and the gas distribution disk **3**. The first surface of the flexible metal sealing ring **4** abuts against the first fitting surface of the gas distribution disk **3**, and the second surface of the flexible metal sealing ring **4** abuts against the second fitting surface of the burner **5**, thereby achieving a better sealing effect. When the burner assembly operates, the gas distribution disk **3** and the burner **5** each are heated to expand, and since the flexible metal sealing ring **4**

has better thermal elasticity, the first fitting surface of the gas distribution disk **3** expanded by heat is pressed on and closely fitted to the first surface of the flexible metal sealing ring **4**, and the second fitting surface of the burner **5** expanded by heat is pressed on and closely fitted to the second surface of the flexible metal sealing ring **4**, such that the burner **5** can be better seal-fitted with the gas distribution disk **3** due to the thermal elasticity of the flexible metal sealing ring **4**, thereby effectively preventing gas leakage and achieving better safety.

**[0035]** Referring to FIGS. **1** to **6**, in one embodiment, a circumferential edge of the top portion of the burner **5** is provided with a ring-shaped boss **52**, and an enclosure wall **51** located in the ring-shaped boss **52** is provided to the top portion of the burner **5** and extends upwards.

**[0036]** The bottom portion of the gas distribution disk **3** is provided with a first flange **32** corresponding to the ring-shaped boss **52**, and the bottom portion of the gas distribution disk **3** is provided with a second flange **31** corresponding to the enclosure wall **51**.

**[0037]** The flexible metal sealing ring **4** includes a first sealing ring **4***b* and a second sealing ring **4***a*. A first surface of the first sealing ring **4***b* abuts against the first flange **32**, and a second surface of the first sealing ring **4***b* abuts against a top part of the ring-shaped boss **52**; a first surface of the second sealing ring **4***a* abuts against the second flange **31**, and a second surface of the second sealing ring **4***a* abuts against a top part of the enclosure wall **51**.

**[0038]** In embodiments of the present invention, the first sealing ring **4***b* is located between the first flange **32** and the ring-shaped boss **52**, thereby facilitating the fixation of the first sealing ring **4***b*. Certainly, the fitting manner between the first flange **32** and the boss is not limited to just one embodiment, but all the other fitting manners, such as the fitting between a boss and a groove or the fitting between two grooves, can be sealed by the first sealing ring **4***b*. The function of the second sealing ring **4***a* is similar to that of the first sealing ring **4***b*, and a structural connection of the second sealing ring **4***a* is similar to that of the first sealing ring **4***b*, which will not be elaborated herein.

**[0039]** Referring to FIGS. **1** to **4**, in one embodiment, the first sealing ring **4***b* is fixed to the first flange **32**, and the second sealing ring **4***a* is fixed to the second flange **31**. In order to facilitate the fixation of the first sealing ring **4***b* and the second sealing ring **4***a*, the first sealing ring **4***b* can be directly mounted to the first flange **32**, or the first sealing ring **4***b* can be directly mounted to the ring-shaped boss **52**. The area of the above first sealing ring **4***b* is adapted to the area of the first flange **32**, so as to achieve a fully close-fit between the first flange **32** and the ring-shaped boss **52**. The function of the second sealing ring **4***a* is similar to that of the first sealing ring **4***b*, and the structural connection of the second sealing ring **4***a* is similar to that of the first sealing ring **4***b*, which will not be elaborated herein.

**[0040]** Referring to FIG. **5**, in one embodiment, the first surface of the first sealing ring **4***b* adheres to the first flange **32** or is screwed to the first flange **32** through a screw, and the second surface of the first sealing ring **4***b* adheres to the top part of the ring-shaped boss **52**; the first surface of the second sealing ring **4***a* adheres to the second flange **31** or is screwed to the second flange **31** through a screw, and the second surface of the second sealing ring **4***a* adheres to the top part of the enclosure wall **51**. In order to further improve the stability of the assembly of the first sealing ring **4***b* and the second sealing ring **4***a*, the first sealing ring **4***b* and the second sealing ring **4***a* can be pasted and fixed by means of an adhesive backing, or connected through a screw. Besides that, the gas distribution disk **3** and the burner **5** can also be screwed and fixed to clamp the first sealing ring **4***b* and the second sealing ring **4***a*.

**[0041]** In one embodiment, the second surface of the first sealing ring **4***b* is provided with an adhesive backing layer (not shown) bonding to the top part of the ring-shaped boss **52**, and the second surface of the second sealing ring **4***a* is provided with an adhesive backing layer bonding to the top part of the enclosure wall **51**. In embodiments of the present invention, the adhesive backing layer can further improve the sealing between the first sealing ring **4***b* and the ring-shaped boss **52** and the sealing between the second sealing ring **4***a* and the enclosure wall **51**, so as to prevent the gas leakage, and can also omit a gluing process, thereby improving the working efficiency.

**[0042]** In one embodiment, a material of the flexible metal sealing ring **4** is aluminum or copper. The aluminum or copper has better thermal elasticity and heat resistance. Besides that, other metal or alloy materials can also be chosen as long as the high-temperature resistance and the better thermal elasticity can be satisfied.

**[0043]** In one embodiment, a thickness of the flexible metal sealing ring **4** is 0.1-0.5 mm. In one embodiment, the thickness of the flexible metal sealing ring **4** is 0.2-0.4 mm. To save materials of the flexible metal sealing ring **4**, the thickness of the flexible metal sealing ring **4** can be reduced, and to satisfy the better thermal elasticity of the flexible metal sealing ring **4**, the thickness can be increased appropriately. It can be understood that, other thicknesses are feasible options, and the specific thickness of the flexible metal sealing ring **4** can be designed flexibly according to a design requirement.

**[0044]** Referring to FIGS. **6** and **7**, in one embodiment, the flexible metal sealing ring **4** is provided with a first material layer **41** and a second material layer **42** in a direction from the first surface to the second surface, the material of the first material layer **41** is as same as that of the gas distribution disk **3**, the material of the second material layer **42** is as same as that of burner **5**, and the first material layer **41** and the second material layer **42** are formed integrally. In order to further improve the sealing property, the flexible metal sealing ring **4** has two layers which can be deposited with or coated with two layers of different thermal elastic metals when being fabricated, so as to enable the gas distribution disk **3** to have the same material as the first material layer **41**, and enable the burner **5** to have the same material as the second material layer **42**, given that the same material has the same heat-resistant quality. The present technical solution can relieve a greater extrusion deformation produced between different components due to different materials, thereby effectively preventing the gas leakage.

**[0045]** Referring to FIGS. **6** and **7**, in one embodiment, the materials of the gas distribution disk **3** and the first material layer **41** are aluminum or copper, while the materials of the burner **5** and the second material layer **42** are iron. In the present embodiment, the material of the gas distribution disk **3** is aluminum or copper, and the material of the burner **5** is iron. In order to reduce the extrusion between the gas distribution disk **3** and the burner **5** when heated, the first material layer **41** of the flexible metal sealing ring **4** has the same material as the gas distribution disk **3**, and the second

material layer **42** of the flexible metal sealing ring **4** has the same material as the burner **5**.

**[0046]** Referring to FIG. **8**, a gas stove is further provided by the present invention, and the gas stove includes a panel **3'**, a base shell **2'** and a burner assembly **1'**. The panel **3'** covers the base shell **2'** and defines, with the base shell **2'**, an accommodation space for accommodating the burner assembly **1'**. A gas inlet end of the burner assembly **1'** is communicated with a gas pipe assembly **4'**. A specific structure of the burner assembly **1'** can refer to the above embodiments. The gas stove adopts all the technical solutions in the above embodiments, thereby at least having the beneficial effects provided by the technical solutions of the above embodiments, which will not be elaborated herein.

**[0047]** The burner **5** is provided with three injection pipes **53**, and the burner **5** has an inner ring passage, a middle ring passage and an outer ring passage correspondingly connected with the three injection pipes in the burner **5**. Burning and injection by means of three independent passages can improve a gas flow of the gas stove. The three injection pipes all adopt the structures based on the Venturi principle, so as to accelerate a flow rate of the gas. A first flame port of the inner ring burner cap **1** communicated with a first flame transfer channel, a second flame port of the inner ring burner cap **1** communicated with a second flame transfer channel, and a major flame port of the outer ring burner cap **2** each adopt a three-level combustion assistance technology, thereby allowing more sufficient combustion of the gas, and improving the combustion efficiency. In addition, the whole gas stove adopts injection for combustion assistance at a nozzle, an injection pipe mouth and the gas distribution disk **3**. By the three-level air injection combustion assistance technology, it is possible to improve the combustion efficiency of the gas, thereby saving the gas cost and improving the quality of the entire product.

**[0048]** The above descriptions are just preferable embodiments of the present invention and are not intended to limit the patent scope of the present invention. Any equivalent structural variations made by making use of the specification or drawings under the inventive concept of the present invention are included in the protection scope of the present invention.

**1**. A burner assembly comprising:

a burner; and

a gas distribution disk mounted to the burner, wherein the burner assembly further comprises:

a flexible metal sealing ring located between the burner and the gas distribution disk, the burner having a first fitting surface on a top portion, and the gas distribution disk having a second fitting surface on a bottom portion; and the flexible metal sealing ring has a first surface and a second surface opposite to the first surface, the first surface being seal-fitted with the first fitting surface of the gas distribution disk, and the second surface being seal-fitted with the second fitting surface of the burner.

**2**. The burner assembly according to claim **1**, wherein a circumferential edge of the top portion of the burner is provided with a ring-shaped boss, and an enclosure wall located in the ring-shaped boss is provided to the top portion of the burner and extends upwards;

the bottom portion of the gas distribution disk is provided with a first flange corresponding to the ring-shaped boss, and the bottom portion of the gas distribution disk is provided with a second flange corresponding to enclosure wall;

the flexible metal sealing ring comprises a first sealing ring and a second sealing ring, a first surface of the first sealing ring abutting against the first flange, a second surface of the first sealing ring abutting against a top part of the ring-shaped boss, a first surface of the second sealing ring abutting against the second flange, and a second surface of the second sealing ring abutting against a top part of the enclosure wall.

**3**. The burner assembly according to claim **2**, wherein the first sealing ring is fixed to the first flange, and the second sealing ring is fixed to the second flange.

**4**. The burner assembly according to claim **3**, wherein the first surface of the first sealing ring adheres to the first flange or is screwed to the first flange through a screw, and the second surface of the first sealing ring adheres to the top part of the ring-shaped boss; the first surface of the second sealing ring adheres to the second flange or is screwed to the second flange through a screw, and the second surface of the second sealing ring adheres to the top part of the enclosure wall.

**5**. The burner assembly according to claim **4**, wherein the second surface of the first sealing ring is provided with an adhesive backing layer bonding to the top part of the ring-shaped boss, and the second surface of the second sealing ring is provided with an adhesive backing layer bonding to the top part of the enclosure wall.

**6**. The burner assembly according to claim **1**, wherein a material of the flexible metal sealing ring is aluminum or copper.

**7**. The burner assembly according to claim **1**, wherein a thickness of the flexible metal sealing ring is 0.1-0.5 mm.

**8**. The burner assembly according to claim **1**, wherein the flexible metal sealing ring is provided with a first material layer and a second material layer in a direction from the first surface to the second surface, the material of the first material layer being as same as that of the gas distribution disk, the material of the second material layer being as same as that of burner, and the first material layer and the second material layer being formed integrally.

**9**. The burner assembly according to claim **8**, wherein the materials of the gas distribution disk and the first material layer are aluminum or copper, and the materials of the burner and the second material layer are iron.

**10**. A gas stove comprising a panel, a base shell and a burner assembly, the panel covering the base shell and defining, with the base shell, an accommodation space for accommodating the burner assembly, wherein the burner assembly comprising:

a burner; and

a gas distribution disk mounted to the burner, wherein the burner assembly further comprises:

a flexible metal sealing ring located between the burner and the gas distribution disk, the burner having a first fitting surface on a top portion, and the gas distribution disk having a second fitting surface on a bottom portion; and the flexible metal sealing ring has a first surface and a second surface opposite to the first surface, the first surface being seal-fitted with the first

fitting surface of the gas distribution disk, and the second surface being seal-fitted with the second fitting surface of the burner.

* * * * *