

DESCRIPTION

【Invention Title】

BURNER FOR STOVE

【Technical Field】

5 The present invention relates to a burner for a stove, which has a burner body that is held on a burner holder mounted to a stove body.

【Background Art】

As an example of conventional burners for stoves, a burner was proposed in which a cylindrical throat part that is vertically formed in the center of the lower surface of a burner body is
10 inserted downward into a support tube part of a burner holder such that the lower surface of the burner body is seated on the upper end of the support tube part, wherein the burner holder includes a base mounted to a stove body and the support tube part provided on the base, with a gas nozzle provided on the base so as to jet fuel gas into the lower end of an opening of the throat part, and wherein mixed gas formed by mixing the fuel gas with primary air introduced into the lower end
15 of the opening of the throat part is supplied into the burner body (for example, referring to Patent Document 1).

Here, to stably hold the burner body on the burner holder without allowing the burner body to be moved, it is required to engage the outer circumferential surface of the throat part with

the inner circumferential surface of the support tube part while maintaining a gap between them so as to form a predetermined insert clearance (a minimum clearance allowing insertion of the throat part into the support tube part) and to secure a long length from the upper end to the lower end of an engaged section of the throat part relative to the support tube part. However, when a substantial
5 amount of broth overflows from a container seated on the stove, the overflowing broth may reach the support tube part and may infiltrate into a small gap between the outer circumferential surface of the throat part and the inner circumferential surface of the support tube part, so the throat part may be fixed to the support tube part by the overflowing broth. Further, when the engaged section of the throat part relative to the support tube part is configured to have a long length, the
10 overflowing broth-caused fixing force becomes stronger, so it may be impossible to disassemble the burner body from the burner holder.

As another example of conventional burners for stoves, a burner was proposed in which a lower end part of a mixing pipe is inserted into a support tube part that is vertically formed in a burner holder, wherein both the outer circumferential surface of the lower end part of the mixing
15 pipe and the inner circumferential surface of the support tube part are configured to be tapered surfaces with gradually increased diameters in a downward direction, and a depressed surface portion is formed in a vertical middle portion of the inner circumferential surface of the support tube part by depressing the inner circumferential surface of the support tube part outward in radial

directions (for example, referring to Patent Document 2). In the burner, the burner body can be easily installed and the length of an engaged section of the support tube part relative to the lower end part of the mixing pipe can be reduced by the depressed surface portion, thereby reducing the overflowing broth-caused fixing force.

5 A further example of conventional burners for stoves may be proposed in which the above-mentioned technique is adapted to the burner disclosed in Patent Document 1, wherein both the outer circumferential surface of the throat part and the inner circumferential surface of the support tube part are configured to be tapered surfaces with gradually reduced diameters in a downward direction, and a depressed surface portion is formed in a vertical middle portion of the
10 inner circumferential surface of the support tube part by depressing the inner circumferential surface of the support tube part outward in radial directions, thereby reducing the overflowing broth-caused fixing force.

 However, the above-mentioned proposal may be problematic as follows. That is, in the burner disclosed in Patent Document 1, the height of the burner body is determined by the
15 positioning of the lower surface of the burner body which is seated on the upper end of the support tube part, so the height of the burner body may be changed by machining tolerance of the lower surface of the burner body or by machining tolerance of the upper end of the support tube part, and the amount of gap between the tapered outer circumferential surface of the throat part and the

tapered inner circumferential surface of the support tube part may be changed by the variation in the height of the burner body, thereby deteriorating the stability of the burner body. Further, to form the depressed surface portion, it is required to use a specifically designed tool that can advance and retract in radial directions, thereby complicating the production process and

5 increasing the production cost of the burner.

Documents of Related Art

(Patent Document 1) Japanese Patent Laid-open Publication No. 2011-52947

(Patent Document 2) Japanese Patent Laid-open Publication No. Sho 60-202220

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【Disclosure】

【Technical Problem】

Accordingly, the present invention has been made keeping in mind the above problems occurring in the related art, and is intended to provide a burner for a stove, which is configured to

15 be free from reducing the stability of a burner body, to prevent overflowing broth from fixing a throat part to a support tube part, and to be easily produced due to an easy machining process.

【Technical Solution】

In order to accomplish the above object, in a burner for a stove, including: a burner body

supported by a burner holder mounted to a stove body, wherein the burner body includes a cylindrical throat part that is vertically formed in a center of a lower surface of the burner body, and the burner holder includes a base mounted to the stove body and a support tube part provided on the base, wherein the throat part is inserted downward into the support tube part such that the lower
5 surface of the burner body is seated on an upper end of the support tube part, with a gas nozzle provided on the base so as to jet fuel gas into a lower end of an opening of the throat part, wherein mixed gas formed by mixing the fuel gas with primary air introduced into the lower end of the opening of the throat part is supplied into the burner body, the present invention is characterized by the following configuration.

10 That is, in the burner, the throat part is provided on an outer circumferential surface thereof with a cylindrical upper engagement male part, a cylindrical lower engagement male part that is formed at a location below the upper engagement male part and has a diameter smaller than a diameter of the upper engagement male part, and a reduced diameter part that is formed at a location between the upper and lower engagement male parts and has a tapered shape with a
15 gradually reduced diameter in a downward direction or has a cylindrical shape with a smaller diameter than the diameter of the upper engagement male part; and the support tube part is provided on an inner circumferential surface with a cylindrical upper engagement female part that is engaged with the upper engagement male part while maintaining a gap between them so as to

form a predetermined insert clearance, a lower engagement female part that is formed at a location below the upper engagement female part and has a smaller diameter than a diameter of the upper engagement female part and is engaged with the lower engagement male part while maintaining a gap between them so as to form a predetermined insert clearance, and a tapered guide part that is

5 formed at a location between the upper and lower engagement female parts and has a tapered shape with a gradually reduced diameter in a downward direction, wherein a vertical length of the upper engagement female part is determined such that a lower end of the upper engagement female part is placed below a lower end of the upper engagement male part in a state in which the lower surface of the burner body is seated on the upper end of the support tube part.

10 In the present invention, all the upper and lower engagement male parts and the upper and lower engagement female parts are formed as cylindrical parts, and so, even when the height of the burner body is changed by machining tolerance of the lower surface of the burner body or by machining tolerance of the upper end of the support tube part, the amounts of gaps between the upper engagement male and female parts and between the lower engagement male and female

15 parts are not changed, but a minimum insert clearance required to insert the throat part can be maintained. Accordingly, the burner body can be stably held on the burner holder without being moved.

Further, in the present invention, a sufficient gap is formed between the reduced diameter

part and a portion of the upper engagement female part which is placed below the lower end of the upper engagement male part, and the present invention can prevent overflowing broth from fixing the throat part to the support tube part at a location around the reduced diameter part. Accordingly, the present invention can reduce the fixing force formed by the overflowing broth and can allow the burner body to be easily disassembled from the burner holder when necessary. Further, the present invention does not require to forming of a depressed surface portion in a vertical middle portion of the inner circumferential surface of the support tube part by depressing the inner circumferential surface of the support tube part outward in radial directions in an effort to reduce a broth-caused fixing force, so the present invention can easily produce the burner due to an easy machining process.

In addition, when the throat part is inserted into the support tube part, the throat part can be concentrically guided into the support tube part by the tapered guide part, so the lower engagement male part and the upper engagement male part can be efficiently engaged with the lower engagement female part and the upper engagement female part, respectively. Accordingly, the assembly process of the burner body can be easily performed.

Further, in the present invention, it is preferred to form a vertically extending cut part in at least one of the lower engagement female part and the lower engagement male part. The cut part allows overflowing broth to be efficiently discharged down from the support tube part

therethrough, thereby improving the function of preventing the throat part from being fixed to the support tube part by the overflowing broth.

【Description of Drawings】

FIG. 1 is a perspective view illustrating a burner for a stove according to a first
5 embodiment of the present invention;

FIG. 2 is a side sectional view taken along line II-II of FIG. 1;

FIG. 3 is a perspective view illustrating the disassembled state of the burner for the stove according to the first embodiment of the present invention;

FIG. 4 is a plan view illustrating a burner holder of a burner for a stove according to a
10 second embodiment of the present invention; and

FIG. 5 is a front sectional view illustrating an assembled state of the burner for the stove according to the second embodiment, taken along line V-V of FIG. 4.

【Mode for Invention】

With reference to FIGS. 1 and 2, reference numeral 1 denotes a burner holder that is
15 mounted to a stove body (not shown). The burner holder 1 is a part that supports a burner A for a stove according to the present invention. The burner holder 1 includes a base 11 that is mounted to the stove body and a support tube part 12 that is placed on the base 11. Described in detail, a support column part 13 is vertically provided on an end of the base 11, a flange part 14 is provided

by protruding from an upper end of the support column part 13 such that the flange part 14 faces the base 11, and the support tube part 12 is formed in the flange part 14. Further, an electrode mount part 15 is provided by protruding from a middle portion of the support column part 13 in a direction opposite to the protruding direction of the flange part 14.

5 On the upper surface of the base 11, a gas nozzle 2 is mounted in such a way that the gas nozzle 2 is aligned with the central axis of the support tube part 12. Fuel gas is supplied to the gas nozzle 2 through a gas channel 16 that is formed in the base 11. Further, on the electrode mount part 15, an ignition electrode 3 is mounted by a mounting member 17 that is mounted to the electrode mount part 15 using a locking bolt 17a.

10 The burner A for the stove includes a burner body 4 that is held on the burner holder 1, and a burner cap 5 that is seated on the burner body 4. The burner body 4 includes a circular base part 41, a cylindrical throat part 42 that is vertically formed in the central portion of the base part 41 in such a way that the throat part 42 extends downward from the lower surface of the base part 41, an annular projection 43 that protrudes upward from the upper surface of the base part 41 such that
15 the annular projection 43 surrounds the upper end of an opening of the throat part 42, and a cylindrical wall 44 that is formed by extending upward from the outside edge of the base part 41. To assemble the burner, the throat part 42 is inserted downward into the support tube part 12 of the burner holder 1, and the lower surface of the burner body 4 or the lower surface of the base part 41

is seated on the upper end of the support tube part 12.

Further, a notch 12a is formed in the circumferential upper end of the support tube part 12 at one location, and a protrusion 42a is formed on the circumferential outside edge of the throat part 42 at one location. Here, the position of the burner body 4 relative to the support tube part 12 is determined by engagement of the protrusion 42a with the notch 12a.

As shown in FIG. 3, the upper end of the cylindrical wall 44 of the burner body 4 is repeatedly depressed so as to form a plurality of flame grooves 45 having small and large sizes. Further, a recessed part 44a is formed in the cylindrical wall 44 by being recessed inwardly in a radial direction at a location corresponding to the ignition electrode 3. A target 46 protrudes radially outward from an inner wall of the recessed part 44a at a circumferentially central position of the upper end of the recessed part 44a such that the target 46 can face the upper end of the ignition electrode 3. Further, a pilot flame groove 47 is formed on each side of the target 46. The pilot flame groove 47 extends toward the ignition electrode 3.

The burner cap 5 has a circular disc shape, with a back plate 51 mounted to the center of the lower surface of the burner cap 5 such that the back plate 51 faces the upper end of the projection 43 while being spaced apart from the upper end of the projection 43 by a predetermined interval. A plurality of positioning pieces 52 are vertically suspended from the outer edge of the back plate 51 at circumferentially spaced locations. The position of the burner cap 5 relative to the

burner body 4 is determined by bringing the lower ends of the positioning pieces 52 into contact with the outer circumferential surface of the projection 43. When positioning the burner cap 5 on the burner body 4 in the above-mentioned manner, the outer edge of the lower surface of the burner cap 5 can come into contact with the upper end of the cylindrical wall 44 of the burner body

5 4. Further, to fix the back plate 51 to the burner cap 5, prominences 53 that are formed on the upper surface of the back plate 51 are aligned with respective depressions formed in the lower surface of the burner cap 5, and the prominences 53 are welded to the burner cap 5.

The gas nozzle 2 is placed just below the throat part 42 that has been inserted into the support tube part 12. When fuel gas jets from the gas nozzle 2 into the lower end of the opening of

10 the throat part 42, gas currents come out from the upper end of the opening of the throat part 42 and collide on the lower surface of the back plate 51, thereby being spread out in radial directions. In the above state, the so-called “radial venturi effect” is generated, so primary air is introduced into the lower end of the opening of the throat part 42. Accordingly, mixed gas is formed by mixing the fuel gas with the inlet primary air, and is fed to the burner body 4 through the throat part 42. In

15 the burner body 4, the mixed gas is released radially outward through the flame grooves 45 of the cylindrical wall 44 and is burnt to produce a flame, thereby heating up a material seated on a burner tripod (not shown) that is placed on an upper plate of the stove.

Here, the outer circumferential surface of the throat part 42 includes a cylindrical upper

engagement male part 421, a cylindrical lower engagement male part 422 that is formed at a location below the upper engagement male part 421 and has a smaller diameter than the diameter of the upper engagement male part 421, and a reduced diameter part 423 that is formed at a location between the upper and lower engagement male parts 421, 422 and has a tapered shape
5 with a gradually reduced diameter in a downward direction.

Further, the inner circumferential surface of the support tube part 12 includes a cylindrical upper engagement female part 121 that is engaged with the upper engagement male part 421 while maintaining a gap between them so as to form a predetermined insert clearance, a lower engagement female part 122 that is formed at a location below the upper engagement female part
10 121 and has a smaller diameter than that of the upper engagement female part 121 and is engaged with the lower engagement male part 422 while maintaining a gap between them so as to form a predetermined insert clearance, and a tapered guide part 123 that is formed at a location between the upper and lower engagement female parts 121, 122 and has a tapered shape with a gradually reduced diameter in a downward direction. Here, the vertical length of the upper engagement
15 female part 121 is determined such that the lower end of the upper engagement female part 121 is placed below the lower end of the upper engagement male part 421 in a state in which the lower surface of the burner body 4 is seated on the upper end of the support tube part 12. Further, the insert clearance means a minimum clearance that is required to insert the throat part 42 into the

support tube part 12, and is preferably set to about 0.05mm.

To realize an easy insertion of the throat part 42 into the support tube part 12, a tapered upper guide part 124, the diameter of which is gradually increased in the upward direction, is formed in the inner circumferential surface of the support tube part 12 at a location above the upper
5 end of the upper engagement female part 121. Further, a tapered lower guide part 424, the diameter of which is gradually reduced in the downward direction, is formed in the outer circumferential surface of the throat part 42 at a location below the lower end of the lower engagement male part 422.

In the above-mentioned embodiment, all the upper and lower engagement male parts 421,
10 422 and the upper and lower engagement female parts 121, 122 are formed as cylindrical parts, and so, even when the height of the burner body 4 is changed by machining tolerance of the lower surface of the burner body 4 or by machining tolerance of the upper end of the support tube part 12, the amounts of gaps between the upper engagement male and female parts 421, 121 and between the lower engagement male and female parts 422, 122 can be maintained at a minimum
15 insert clearance required to insert the throat part 42. Accordingly, the burner body 4 can be stably held on the support tube part 12 without being moved.

Here, the outer circumferential surface of the throat part 42 may be engaged with the inner circumferential surface of the support tube part 12 over the whole vertical length with the

exception of a portion of the guide part 124 while maintaining a gap between them so as to form the insert clearance between the two parts, thereby securing a sufficient length of the engaged section of the throat part 42 relative to the support tube part 12.

However, the above-mentioned alteration may cause the following problems. That is,

5 when a substantial amount of broth overflows from a container seated on the stove, the overflowing broth may flow along the lower surface of the burner body 4, and may infiltrate into the support tube part 12 due to a capillary phenomenon through a small gap between the upper end of the support tube part 12 and the lower surface of the burner body 4. Accordingly, the throat part 42 may be fixed to the support tube part 12 by the overflowing broth. Here, when the sufficient

10 length of the engaged section of the throat part 42 relative to the support tube part 12 is secured as described above, the overflowing broth-caused fixing force become stronger, so it may be impossible to disassemble the burner body 4 from the support tube part 12 of the burner holder 1.

Further, as an alteration for realizing a reduction in the overflowing broth-caused fixing force, a depressed surface portion may be formed in a vertical middle portion of the inner

15 circumferential surface of the support tube part 12 by depressing the inner circumferential surface of the support tube part 12 outward in a radial direction. However, this alteration is problematic in that, to form the depressed surface portion, it is required to use a specifically designed tool that can advance and retract in radial directions, thereby complicating the production process and

increasing the production cost of the burner.

However, in the above-mentioned embodiment of the present invention, the lower engagement male part 422 and the lower engagement female part 122 are configured to have smaller diameters than those of the upper engagement male part 421 and the upper engagement female part 121, the reduced diameter part 423 is formed at a location between the upper engagement male part 421 and the lower engagement male part 422, and the lower end of the upper engagement female part 121 is placed below the lower end of the upper engagement male part 421, so a sufficient gap is formed between the upper engagement female part 121, the guide part 123 and the reduced diameter part 423. Due to the sufficient gap, overflowing broth cannot fix the throat part 42 to the support tube part 12 at a location around the reduced diameter part 423. Accordingly, it is possible to reduce the overflowing broth-caused fixing force and allow the burner body 4 to be easily disassembled from the support tube part 12. Further, it is not necessary to form a depressed surface portion in a vertical middle portion of the inner circumferential surface of the support tube part 12, so the burner can be easily produced due to an easy machining process and an increase in the production cost can be avoided.

Further, when the throat part 42 is inserted into the support tube part 12, the tapered guide part 123 realizes concentric alignment of the throat part 42 with the support tube part 12, so the lower engagement male part 422 and the upper engagement male part 421 can be efficiently

engaged with the lower engagement female part 122 and the upper engagement female part 121, respectively. Accordingly, the burner body 4 can be easily mounted to the support tube part 12.

Hereinbelow, a burner for a stove according to a second embodiment of the present invention will be described with reference to FIGS. 4 and 5. The basic construction of the burner for the stove according to the second embodiment remains the same as that described for the first embodiment. Those parts and elements common to both the first embodiment and the second embodiment will thus carry the same reference numerals. A difference between the second embodiment and the first embodiment resides in that vertically extending cut parts 125 are formed in the lower engagement female part 122 at a plurality of locations (for example, three locations) that are circumferentially spaced apart from each other.

In the second embodiment, overflowing broth that has flowed from a container to the support tube part 12 can drip from the support tube part 12 through the cut parts 125. Accordingly, the cut parts 125 can prevent the overflowing broth from remaining in the support tube part 12 and from being fixed to the support tube part 12, thereby improving the function of preventing the fixing of the throat part 42 to the support tube part 12 by the overflowing broth.

Here, the outer diameter of the cut parts 125 is equal to the inner diameter of the upper engagement female part 121. Further, each of the cut parts 125 extends downward from the lower end of the upper engagement female part 121 to the lower end of the lower engagement female

part 122 while passing through the guide part 123. However, it should be understood that the outer diameter of the cut parts 125 may be configured to be smaller than the inner diameter of the upper engagement female part 121, and that each of the cut parts 125 may extend downward from a lower portion of the guide part 123.

5 In the above description, although the embodiments of the present invention have been described with reference to the accompanying drawings, it should be understood that the present invention is not limited thereto. For example, unlike the embodiment in which the tapered reduced diameter part 423 having a tapered shape with a gradually reduced diameter in the downward direction is formed at a location between the upper and lower engagement male parts 421, 422 of
10 the outer circumferential surface of the throat part 42, a cylindrical reduced diameter part that has a smaller diameter than that of the upper engagement male part 421 may be formed at a location between the engagement male parts 421, 422. In this case, the diameter of the cylindrical reduced diameter part may be equal to or smaller than the diameter of the lower engagement male part 422.

 Further, unlike the second embodiment in which the vertically extending cut parts 125 for
15 dripping overflowing broth are formed in the lower engagement female part 122, the cut parts 125 for dripping overflowing broth may be formed in the lower engagement male part 422 or may be formed in both the lower engagement female part 122 and the lower engagement male part 422.

Description of Reference Characters

A: burner for stove

1: burner holder

11: base

12: support tube part

121: upper engagement female part

5 122: lower engagement female part

123: guide part

125: cut part

2: gas nozzle

4: burner body

42: throat part

421: upper engagement male part

10 422: lower engagement male part

423: reduced diameter part.

CLAIMS

1. A burner for a stove, comprising:

a burner body supported by a burner holder mounted to a stove body, wherein the burner body includes a cylindrical throat part that is vertically formed in a center of a lower surface of the burner body, and the burner holder includes a base mounted to the stove body and a support tube part provided on the base, wherein the throat part is inserted downward into the support tube part such that the lower surface of the burner body is seated on an upper end of the support tube part, with a gas nozzle provided on the base so as to jet fuel gas into a lower end of an opening of the throat part, wherein mixed gas formed by mixing the fuel gas with primary air introduced into the lower end of the opening of the throat part is supplied into the burner body, wherein

the throat part is provided on an outer circumferential surface thereof with a cylindrical upper engagement male part, a cylindrical lower engagement male part that is formed at a location below the upper engagement male part and has a diameter smaller than a diameter of the upper engagement male part, and a reduced diameter part that is formed at a location between the upper and lower engagement male parts and has a tapered shape with a gradually reduced diameter in a downward direction or has a cylindrical shape with a smaller diameter than the diameter of the upper engagement male part; and

the support tube part is provided on an inner circumferential surface with a cylindrical upper engagement female part that is engaged with the upper engagement male part while maintaining a gap between them so as to form a predetermined insert clearance, a lower engagement female part that is formed at a location below the upper engagement female part and has a smaller diameter than a diameter of the upper engagement female part and is engaged with the lower engagement male part while maintaining a gap between them so as to form a predetermined insert clearance, and a tapered guide part that is formed at a location between the upper and lower engagement female parts and has a tapered shape with a gradually reduced diameter in a downward direction, wherein

a vertical length of the upper engagement female part is determined such that a lower end of the upper engagement female part is placed below a lower end of the upper engagement male part in a state in which the lower surface of the burner body is seated on the upper end of the support tube part.

2. The burner for the stove as set forth in claim 1, wherein a vertically extending cut part is formed in at least one of the lower engagement female part and the lower engagement male part.