

Gas Burner

The present invention relates to a gas burner for a stove, suitable for use in Chinese cooking.

Gas burners need to have high power for successfully heating a vessel such as a wok, steam tray or the like to high enough temperatures for Chinese cooking.

Figure 1 shows a conventional burner 1 used in Chinese cooking. The burner 1 comprises a hollow burner body 3 through which a gas supply pipe 5 extends from below, the gas supply pipe 5 having a gas outlet nozzle 7 at its upper end. A large air supply pipe 9, concentric with the gas supply pipe 5, also extends up from the bottom 3a of the burner body 3. A concentric air chamber cover 11, forming an air supply fitting, covers the air supply pipe 9, whilst the gas supply pipe 5 extends through it. The air chamber cover 11 supplies air to the gas outlet nozzle 7 through small circular apertures 12 arranged around the periphery 11a of the chamber cover 11 as shown in figure 2.

In use, the burner 1 has a firebrick 17 and a cover 19. Air is blown up through the air supply pipe 9, passes through the apertures 12 and circulates around the gas

outlet nozzle where the air and gas are mixed and burn.

However, such burners have the disadvantage that they generate noise levels considerably above the background noise levels. This is to a large extent due to the "whistle effect" as air is blown through the apertures in the air chamber cover.

Furthermore, conventional burners require large and powerful high static pressure blowers to force air through the apertures in the air chamber cover. Such blowers are expensive to buy and consume a lot of fuel, making the burner expensive to use.

The present invention provides a cooker for Chinese cooking, comprising a gas burner for heating a cooking vessel, the burner comprising a hollow burner body, a gas supply pipe extending upwardly through the burner body and having a nozzle at its upper end, the nozzle directing the gas laterally, a flame chamber surrounding the nozzle, the flame chamber having an open end, above which the cooking vessel is to be positioned, and an open lower end connected to the upper end of the burner body, an air inlet pipe for supplying an upward flow of air to the burner body from a blower, and an air supply fitting arranged in the burner body between the air inlet pipe and the nozzle, the air supply fitting having

a plurality of vanes which cause air to flow through the burner in a substantially spiral path, the vanes defining between them unobstructed passageways, wherein, in use, air flows from the air inlet pipe along an unimpeded upward path through the burner body towards the nozzle.

Further preferred and optional features of the invention will be apparent from the following description and the accompanying claims.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is an exploded view of a prior art burner;

Figure 2 is a perspective view of the underside of the air supply fitting (chamber cover) of figure 1;

Figure 3 is a medial longitudinal cross section of a burner forming an embodiment of the present invention;

Figure 4 is a plan view of the burner of figure 3.

Figure 5 is a perspective view of the air supply fitting of the burner of figures 3 and 4, and

Figure 6 is a side view of the air supply fitting of figure 5.

Figures 3 and 4 show a burner 1 having a cast iron burner body 3 with a base 3a and peripheral wall 3b. A steel gas supply pipe 5 extends vertically through and coaxially with the burner body 3. The gas supply pipe 5 passes through the centre of the base 3a of the burner body 3 and is connected, in use, to a gas supply 5a. At its upper end, the gas supply pipe 3 has a gas outlet nozzle 7 where gas is ignited and burned.

The gas outlet nozzle 7 is a steel cylinder with an annular recess 6 having gas outlet holes 6a around its periphery.

A large galvanised steel air supply pipe 9, coaxial with and surrounding the gas supply pipe 5, also extends up through the base 3a of the burner body 3. Air is blown into the air supply pipe 9 of the burner 1 by an air blower (not shown). A cast iron air supply fitting 11 covers the air supply pipe 9 whilst the gas supply

pipe 5 extends through it. The air supply fitting 11 controls the direction of flow of air to and around the nozzle 7.

The air supply fitting 11 comprises five air guide vanes 15a to 15e arranged uniformly around a cylindrical hub 16 which surrounds the gas supply pipe 3. Each vane 15 overlaps almost half of the adjacent vane.

The vanes 15a-e radiate outwardly from the hub 16, each extending along a line at an angle oblique to the radial direction. The vanes 15a-e are twisted so that their surfaces each form part of a helical surface. The angle of the helical surface is about 40 degrees to the transverse plane. As can be seen in Figure 4, the thickness of each vane gradually increases outwards.

As air is blown up through the air supply pipe 9 the arrangement of vanes 15a-e causes the air to be directed towards and around the nozzle 7 in a spiral path.

The spiral circulation of the air has the advantage of increased supply of oxygen to the burner nozzle 7 and hence increased power and concentration of flame.

This new design of air supply fitting produces considerably less noise than the prior art because the vanes do not produce a "whistle effect". Furthermore

the design is cheaper to manufacture and can be used with a smaller, less powerful blower, which means that the burner is less expensive to operate.

A prototype fitting in a gas burner made in accordance with the invention has been tested and gave the results set out below. The results show that the burner produces substantially less noise in comparison with the prior art while maintaining a power output high enough for heating vessels in Chinese cooking.

Example

Measurements at a gas pressure of 1.5 KPa; gas temperature of 21 °C and background sound level of 78 dB

	Present Invention	Prior Art
Burning Capacity	194.4 MJ/h	216 MJ/h
Sound Level	88 dB	97 dB

In use, the burner has a clay firebrick 17 which surrounds the burner nozzle 7 and a cast iron cover 19

which seats on a cast iron couple ring 21 for coupling the cover to the burner body 3.

The burner is ignited by a conventional ignition system comprising a brass or steel pilot lighter nozzle 23, a brass or steel flame failure device sensor 25 and an air supply pipe 27.

It will be appreciated that various modifications can be made to the described embodiment without departing from the scope of the accompanying claims.

**CLAIMS:**

1. A cooker for Chinese cooking, comprising a gas burner for heating a cooking vessel, the burner comprising a hollow burner body, a gas supply pipe extending upwardly through the burner body and having a nozzle at its upper end, the nozzle directing the gas laterally, a flame chamber surrounding the nozzle, the flame chamber having an open end, above which the cooking vessel is to be positioned, and an open lower end connected to the upper end of the burner body, an air inlet pipe for supplying an upward flow of air to the burner body from a blower, and an air supply fitting arranged in the burner body between the air inlet pipe and the nozzle, the air supply fitting having a plurality of vanes which cause air to flow through the burner in a substantially spiral path, the vanes defining between them unobstructed passageways, wherein, in use, air flows from the air inlet pipe along an unimpeded upward path through the burner body towards the nozzle.
2. A cooker as claimed in claim 1, wherein the burner body, gas supply pipe and air supply fitting are arranged coaxially.
3. A cooker as claimed in claim 1 or claim 2, wherein



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the burner body, gas supply pipe and air supply fitting are of circular cross section.

4. A cooker as claimed in claim 3, wherein each vane radiates along a line at an angle oblique to the radial direction.

5. A cooker as claimed in claim 1, 2, 3 or 4, wherein the vanes are twisted so that their surfaces form part of a helical surface.

6. A cooker as claimed in claim 5, wherein each vane overlaps an adjacent vane.

7. A cooker as claimed in claim 5 or 6, wherein the angle of the helical surface of the vanes is in the range of 30 to 60 degrees to a transverse plane.

8. A cooker as claimed in claim 5, 6 or 7, wherein the angle of the helical surface of the vanes is in the range of 35 to 50 degrees to a transverse plane.

9. A cooker as claimed in claim 5, 6, 7 or 8, wherein the angle of the helical surface of the vanes is 40 degrees to a transverse plane.

10. A cooker as claimed in any preceding claim, wherein



the air supply fitting includes a hub, which in use surrounds the gas supply pipe, from which the vanes radiate.

11. A cooker as claimed in any preceding claim, wherein the thickness of each vane increases outwards.

12. A cooker comprising a gas burner substantially as described with reference to, and as shown in, Figures 3 to 6 of the accompanying drawings.