

[54] **GAS BURNER HAVING LATERAL OPENINGS AND A DEVICE FOR DEFLECTING THE FLAMES UPWARDS**

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Related U.S. Application Data

[62] Division of Ser. No. 306,775, Nov. 15, 1972, Pat. No. 3,817,689.

[52] U.S. Cl. **239/553; 239/567; 239/568**

[51] Int. Cl.² **B05B 1/14**

[58] Field of Search 431/347, 349; 239/553, 239/553.5, 559, 567, 568

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[57]

ABSTRACT

A gas burner according to the invention comprises: a mixing chamber having a thin, vertical, lateral wall perforated by outlets for the combustion mixture, a deflector disposed inside the mixing chamber; said deflector having a slanting part which directs the flames upwards in a slanting manner, and a cover coated with a self-cleaning catalytic enamel. The cover may be made of metal or ceramic material. The burner also comprises a crown for distributing the heat during cooking operations requiring low heat.

3 Claims, 8 Drawing Figures

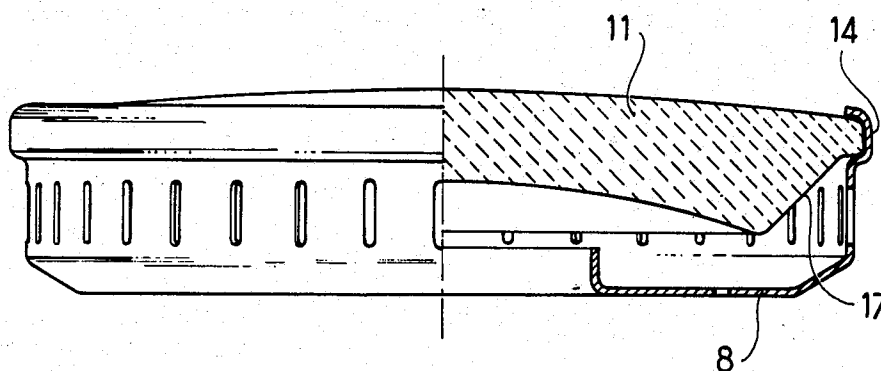


FIG. 1

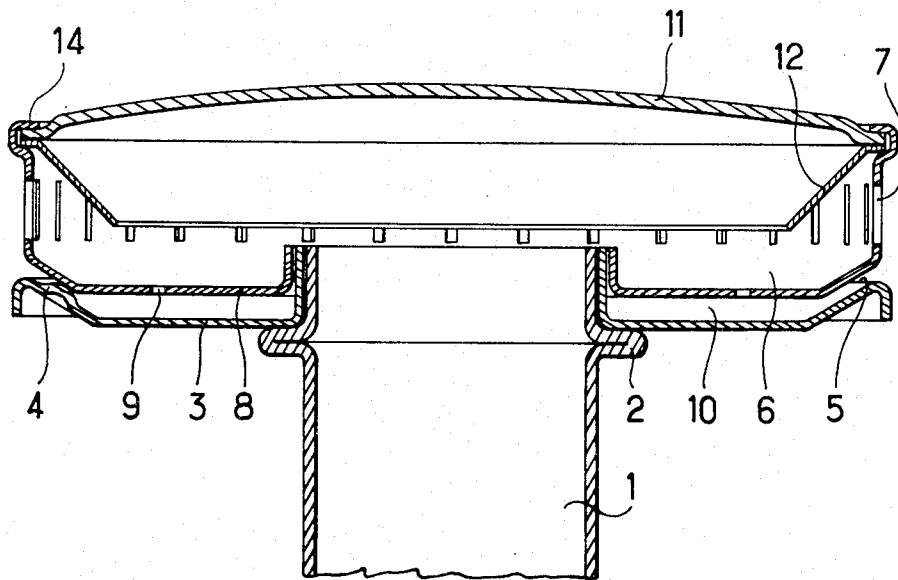


FIG. 2

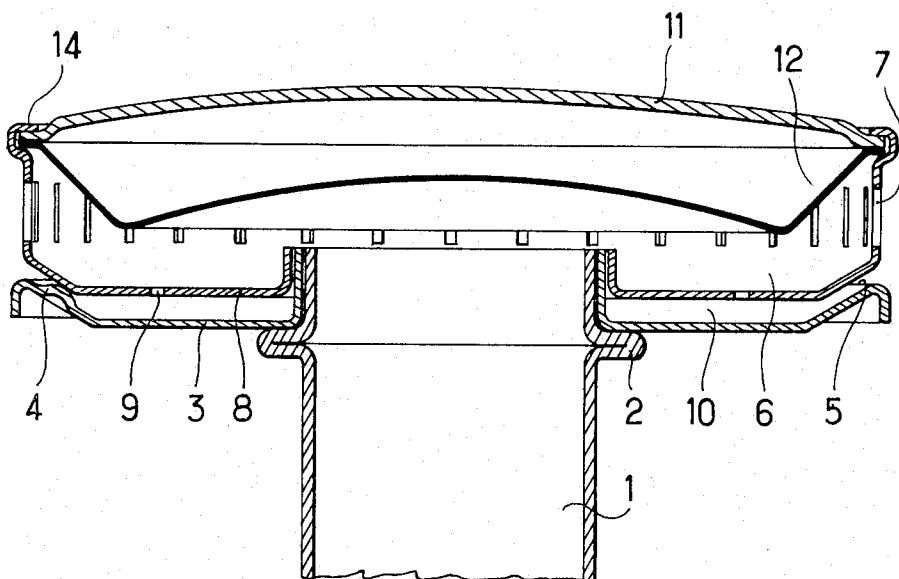


FIG. 3

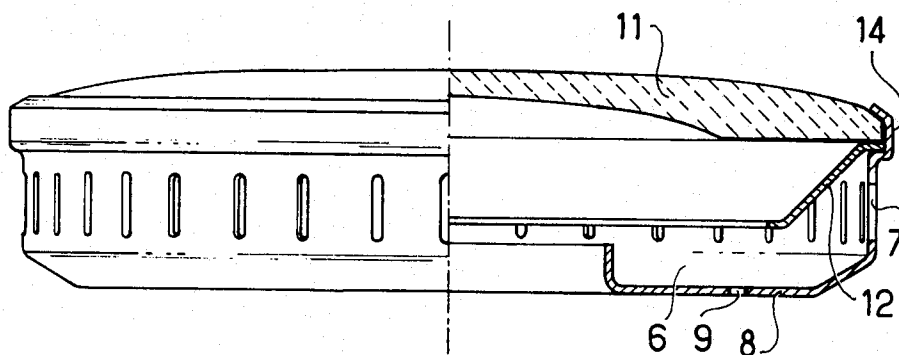


FIG. 4

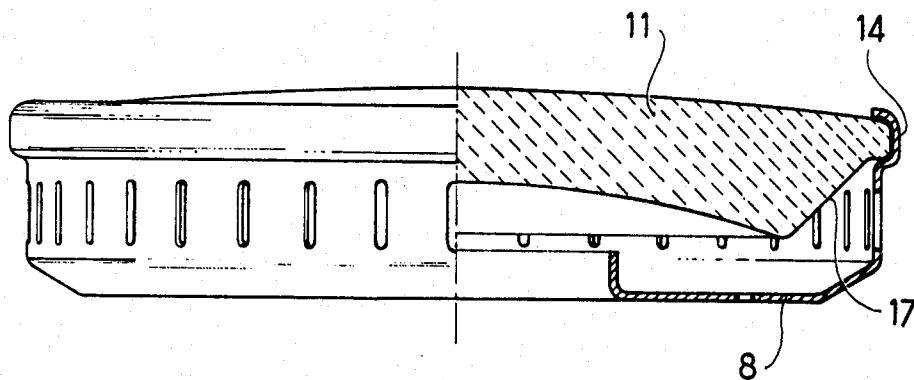


FIG. 5

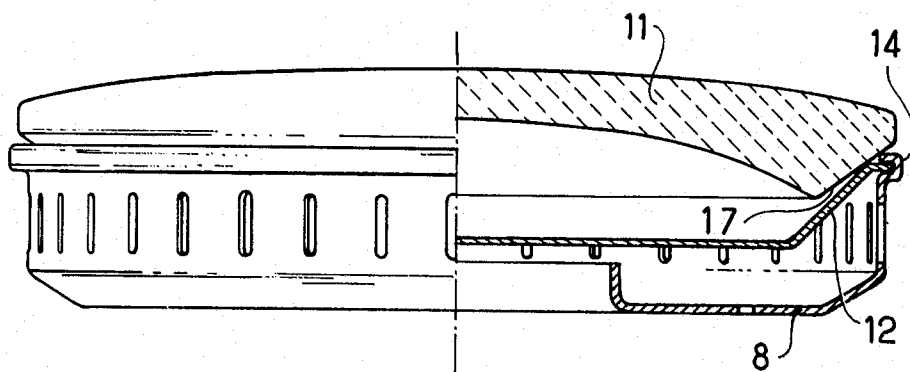


FIG. 6

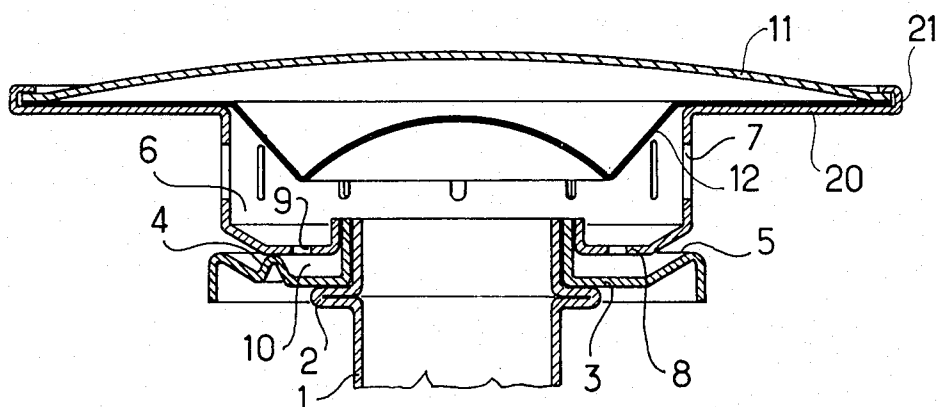


FIG. 7

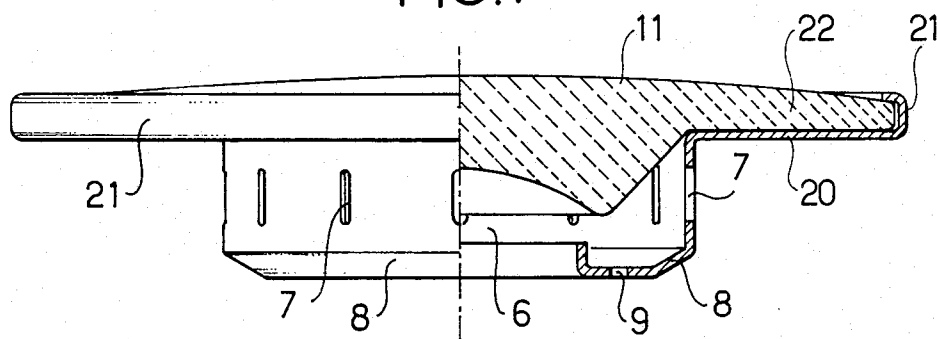
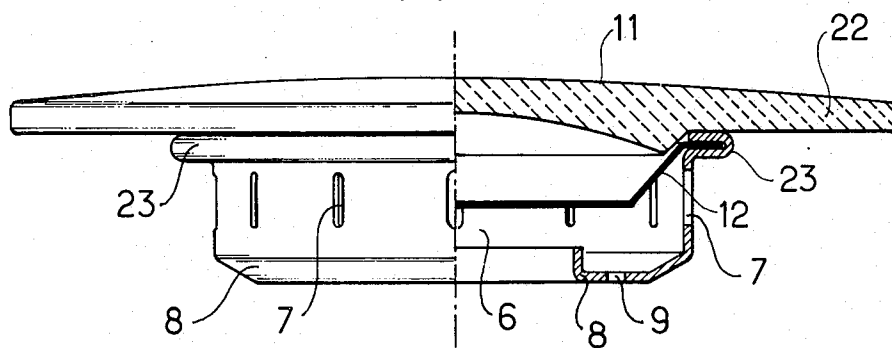


FIG. 8



GAS BURNER HAVING LATERAL OPENINGS AND A DEVICE FOR DEFLECTING THE FLAMES UPWARDS

This is a division of application Ser. No. 306,775 filed Nov. 15, 1972 and now U.S. Pat. No. 3,817,689.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a gas burner comprising a mixing chamber having a substantially cylindrical thin, lateral wall with vertical generatrices perforated by outlets for the combustion mixture. More particularly, it relates to circular burners for cooking stoves.

2. Prior Art

Gas burners with a thick cast metal wall are already known, in which it is possible to direct the flames upwards in a slanting manner by directing the apertures in the cylindrical vertical wall. This insures better heat output and cleaner combustion by reducing the proportion of unburned and incompletely burned gas. Less expensive burners of a simpler design and made of thin sheet metal, are also known. Burners of this type have the particular disadvantage of becoming soiled when the liquid in a container placed on the burner, boils over. On the other hand, a certain amount of lining occurs, i.e. the enamel cracks during operation of the burner when the burner cover is made of ordinary enamelled metal, due to the disparities in temperature between the periphery and the centre.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a gas burner with a cover adapted to withstand without damage the thermal stresses produced by temperature disparities during the operation thereof.

Another object of the invention is to make it possible to dismantle the cover.

Yet another object of the invention is to eliminate the cleaning process as the cover is self-cleaning.

The gas burner according to the invention is characterized in that it comprises a cover which is resistant to thermal stresses, and a deflector which is disposed inside the mixing chamber and which comprises a slanting part for directing the flames upwards in a slanting manner.

Advantageously, the burner according to the invention also comprises at least one of the following features: the cover is coated with a catalytic enamel, thus rendering the burner self-cleaning; the cover is made of metal coated with a catalytic enamel; the burner cover is made of ceramic material; the ceramic cover comprises a lower wall having a slanting part forming a deflector which directs the flames upwards in a slanting manner; the ceramic cover is arranged with a deflector made of thin metal, at the upper part of the burner body; the ceramic cover is placed on the burner, the deflector comprising a solid base; the cover comprises a horizontal part covering the flames in the low intensity area.

Other features of the present invention will be made apparent from the following detailed description of the preferred embodiments thereof, provided by way of non-limitative examples, and from the accompanying drawings representing said embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows an axial sectional view of a gas burner according to the invention.

FIGS. 2-8 show variants of the burner according to the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 shows an embodiment of a burner according to the invention. It comprises a venturi 1, the collar 2 of which supports a lower circular pan 3, with the exception of 3 bosses such as 4, distributed at an angle of 120° from each other and serving to calibrate the pilot opening 5. The pan 3 supports a circular mixing chamber, comprising a burner pan 6 having a cylindrical, vertical, lateral wall, provided with extended discharge apertures 7 for the main flames. Its base 8 is perforated by apertures 9 supplying the expansion chamber 10, defined by the pan 3. The circular mixing chamber also comprises a slightly convex cover 11 and a frusto-conical deflector 12. The cover and the deflector are rendered integral with the wall of the mixing chamber by crimping the upper edge 14 of the wall over the edges of these parts. The deflector 12 deflects the flames upwards in a slanting manner. In the absence of this deflector they would be substantially horizontal. In this way, the flames reach the base of the container to be heated, which is placed above the burner, closer to its axis than in the absence of the deflector. The flames are also longer. The heat output is thus improved and the rate of complete combustion increased, thereby avoiding the discharge of unburned hydrocarbons or carbon monoxide.

Each of the parts constituting the burner can thus be made of inoxidable thin sheet metal adapted for regular service conditions or suitably protected. The cover 11 is coated with catalytic enamel prior to the crimping operation.

In the embodiment shown in FIG. 2, the burner comprises a venturi 1 having a peripheral collar 2 which supports a lower circular pan 3, with the exception of 3 bosses 4 distributed on the circumference and serving to calibrate a pilot opening 5. The pan 3 supports a circular mixing chamber 6, comprising a burner pan 8 having a cylindrical, vertical, lateral wall provided with extended discharge apertures 7 for the main flames. Its base 8 is perforated by apertures 9 supplying the pilot chamber 10. It also comprises a slightly convex cover 11 coated with a catalytic enamel and a deflector 12 having a frusto-conical lateral wall and an incurvated solid base 13. The cover 11 and the deflector 12 are rendered integral with the wall of the mixing chamber by crimping the upper edge 14 over the edges of these parts. The main flames are deflected upwards in a slanting manner by the deflector 12. This deflector 12 is solid and it defines the chamber 6 for mixing combustible gas and primary air. The volume of the mixing chamber may be varied by giving the base of the deflector a flat shape or a more or less incurvated shape according to the gas used, its pressure and the capacity of the burner.

In the embodiment represented in FIG. 3, the venturi and the pilot chamber are not shown. The burner comprises a circular mixing chamber 6. This comprises a pan 8 having a cylindrical lateral wall provided with extended apertures 7 for discharging the main flames. Its base 8 is perforated by apertures 9 supplying the pilot

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chamber situated below the wall 8. The burner also comprises a slightly convex cover 11 and a deflector 12 having a frusto-conical lateral wall and a solid or hollow base. The cover 11 and the deflector 12 are rendered integral with the wall of the mixing chamber by crimping the upper edge 14 of this wall over the edges of these parts. The main flames are deflected upwards in a slanting manner by the deflector 12.

The cover 11 is made of ceramic material and it may also be coated with a catalytic enamel. The use of a catalytic enamel allows the burner to be kept permanently clean.

FIG. 4 shows a burner of the same type, comprising the same elements as that of FIG. 3 but in which the cover 11 and the deflector 12 are replaced by a single ceramic part 11 forming both a burner cover and a deflector redirecting the flames upwardly. For this reason, the lower part of the member 11 is the same shape as the deflector in FIG. 2, i.e., it comprises at least one part shaped in the form of an inverted truncated cone directing the flames in a slanting manner upwards. The edge of the lateral wall 14 of the mixing chamber is crimped over the edge of the cover 11.

FIG. 5 shows another variant of the burner in which the cover 11 consists of a ceramic tablet which is simply placed on the burner. In this case, the deflector 12 made of thin sheet metal, is solid and is mounted at 14 on the edge of the lateral wall of the burner body in such a manner as to close the mixing chamber. The edge of the tablet 11 comprises an inclined part 17 allowing the tablet to be applied to and centred on the deflector-burner body assembly.

FIGS. 6, 7 and 8 show embodiments of burners according to the invention, permitting a low intensity heating action to be obtained more easily in containers used for the cooking operation known as "simmering" and further permitting the heat to be distributed in a uniform manner under the base of the cooking utensils.

It is already known in the art to obtain this type of effect by interposing a concave metal screen between the burner head and the container. The metal screen thus acts as a diffuser.

When the metal screen is integral with a grill which supports the containers to be heated, this screen is soldered to the grill and the soldered joints are situated in the flame when the burner is on "high". For this reason it is necessary to use soldering materials having a very high point of fusion. Furthermore, the incorporation of this type of metal screen considerably complicates the manufacture of the grill. It is possible to use a metal screen known as a diffuser, which is placed on the grill without a screen. A diffuser of this type, which generally has fairly large dimensions in order to support the cooking utensils, must be removed from the grill when the burner is fully "turned on".

A gas burner according to the invention does not have the disadvantages of known burners when used for "simmering". Neither does a metal screen have to be interposed between the burner and the container to be heated.

A gas burner adapted for low intensity cooking is produced by surrounding the lateral wall of the mixing chamber and the upper part of the same with a horizontal crown which is flat or slightly concave toward the base. The outer diameter of the crown is one-third to twice the inner diameter so as to cover the flames when the burner is operated at its minimum rate.

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FIG. 6 shows a burner having an enamelled metal cover. As in FIG. 1, it consists of a venturi, the collar of which supports a lower circular pan 3, with the exception of 3 bosses such as 4. These bosses, which are used to calibrate the pilot opening, are distributed at an angle of 120° from each other. The pan 3 supports a circular mixing chamber comprising a burner pan 6 having a cylindrical, vertical, lateral wall provided with extended outlets 7 for the main flames. The horizontal crown 20 forms an extension of the vertical wall. The base 8 of the burner pan is perforated by openings 9 supplying the expansion chamber limited by the pan 3.

The mixing chamber also comprises a deflector 12 having a frusto-conical lateral wall, a convex base and a slightly convex cover 11. The cover 11 and the deflector 12 are rendered integral with the pan 6 of the mixing chamber by crimping the upper edge 21 of the crown of the pan over the edges of these parts. The crown 20 may be flat or slightly convex. Its outer diameter is in the order of one-third to twice its inner diameter which is also that of the vertical wall of the pan 6 limiting the mixing chamber.

FIG. 7 shows a burner with a ceramic cover 11. The reference numerals used in FIG. 7 have the same meaning as those used in FIG. 1 but the venturi has not been represented. The ceramic cover also acts as a deflector, the lower part of the cover having the same shape as the deflector shown in FIG. 1. The cover also comprises a crown 22 which rests on the crown 20. The cover 11 and the pan 6 of the mixing chamber are joined by crimping the upper edge 21 of this pan over the edge of the cover.

FIG. 8 shows a burner with a ceramic cover 11. The cover is detachable. The reference numerals used in FIG. 8 have the same meaning as those used in FIGS. 1, 6 and 7 but the venturi has not been represented. The ceramic cover 11 comprises a crown 22. It rests on the assembly formed by the metal deflector 12 and the pan 6 which are joined by crimping the upper edge 23 of this pan over the edge of the deflector.

Obviously, the sheet metal or ceramic cover may also be enamelled with a catalytic enamel.

The invention, which has been described, may obviously be modified in various ways without departing from the scope of the invention and certain elements may be replaced by others having the same technical function.

What is claimed is:

1. In a thin-walled burner having a mixing chamber defined by a substantially cylindrical, thin, lateral wall with vertical generatrices perforated by vertical slots for the combustion mixture, the improvement comprising a single piece cover means made of ceramic material attached to the upper edge of said lateral wall by a crimped portion, said cover means including a lower face adjacent said slots inclined inwardly of said wall and away from said upper edge which constitutes a fuel deflector.

2. A burner according to claim 1 wherein said lower face is in the form of a truncated cone so as to deflect the fuel upwards in a slanting manner.

3. A gas burner according to claim 1 wherein the outer diameter of the cover and deflector means is one-third to twice the inner diameter of the vertical generatrices defining the mixing chamber.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,921,913
DATED : November 25, 1975
INVENTOR(S) : Marcel CAPY

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

IN THE HEADING:

ADD:

Foreign Application Priority Data

November 15, 1971 France..... 7140801

Signed and Sealed this

twenty-fourth Day of February 1976

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

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