ABSTRACT

Secondary air opening between a gas burner and aeration pan is smaller than conventional. The bottom of the pan extends upwardly toward the burner at a slope directed toward the burner port bases to guide supplemental secondary air drawn into the pan through openings in its side wall.

8 Claims, 2 Drawing Figures
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GAS BURNER AND AERATION PAN ASSEMBLY

This is a continuation of application Ser. No. 307,079, filed Nov. 16, 1972, now abandoned.

This invention relates to the combination of a gas burner and a drip pan or aeration pan such as is frequently used in domestic gas ranges.

Many gas burners now in use have the form of an inverted closed-center cup as distinguished from an open center ring shaped burner. No secondary air can rise through the closed center of the burner to mingle with the burning fuel gas mixture at the ports around the outside of the burner. When such a burner is used in combination with a drip pan it is conventional to provide a clearance between the sides of the burner and the central opening in the drip pan. This clearance provides an opening through which secondary air is furnished to the burner ports.

The secondary air opening in the conventional burner-drip pan assembly is regarded as esthetically unattractive. Attempts to abate this feature have necessitated lowering the burner to facilitate entrainment of more secondary air between the burner top and grate but so lowering the burner sacrifices thermal efficiency and in some ranges there is no room to lower the burner.

The object of the present invention is to provide a simple, inexpensive burner-aeration pan assembly improved so that the diameter of the secondary air opening around the burner can be decreased to esthetically attractive dimensions while enabling the burner to be maintained at a height at which its thermal efficiency is at a maximum.

In general the invention is carried out by providing the aeration pan with a bottom which slopes upwardly from its junction with the side wall toward the burner along a slope which is directed toward the bases of the burner ports. The side wall is apertured so that secondary air is drawn into the pan and is guided upwardly along the upper surfaces of the pan bottom toward the bases of the burner ports.

One form of the invention is illustrated in the accompanying drawings:

FIG. 1 is a fragmentary elevational view of a gas range embodying the present invention, with portions broken away and shown in section to illustrate structural details.

FIG. 2 is a fragmentary top plan view of the structure shown in FIG. 1 with the grate removed.

Shown in the drawings is a gas range 10 having a top 12 with an opening 14. A drip pan or aeration pan 16 has a generally vertical side wall 18 which fits within opening 14. The side wall terminates in an outward rim or flange 20 which rests on range top 12. A grate 22 for supporting cooking vessels has a ring 24 which rests on rim 20 and lugs 26 depending from the ring fit within side wall 18.

Pan 16 has a central opening 28 and a gas burner 30 is supported within this opening by a mounting bracket 32 within range 10. A flash tube is illustrated at 33. A mixture of fuel gas and primary air is furnished to burner 30 through a mixing tube 34. The burner illustrated has the form of an inverted cup having a closed-center top 36 and an adjacent port ring 38 through which a circumferential array of burner ports 40 are provided. The bases or bottoms of the burner ports are adjacent the base or bottom 42 of the burner ring as illustrated.

Pan 16 has a bottom 44 which adjoins side wall 18 at portions 46 distal of burner 30. Bottom 44 extends from distal portions 46 upwardly toward burner 30 at a slope which is directed toward the bases of burner ports 40. Bottom 44 terminates inwardly at edge portions 47 proximal to the burner which define opening 28.

Side wall 18 is provided above the level of distal portions 46 with a circumferentially distributed series of openings which in the illustrated structure comprise slots 48. In the illustrated structure these slots are four in number and are distributed uniformly around a major portion of the circumference of side wall 18.

Opening 28 has a diameter in the range from about ¾ inch to about ½ inch larger than the diameter of burner 30. Thus the clearance between edge 47 and the burner ranges from about ¾ inch to about ½ inch.

When the diameter of opening 28 is in the smaller end of this range, a number of tabs 50 are provided which project radially inwardly from edge 47 for engagement with side wall 52 of the burner to maintain the burner and edge 47 in centered relation for a purpose to be described.

When burner 30 and pan 16 are assembled in a gas range 10 as in FIG. 1, the visibility of opening 28 is low since it has a substantially smaller diameter than the central openings in conventional aeration pans. A burner-aeration pan assembly according to the present invention is therefore esthetically more attractive than the conventional combination and its marketability is improved.

In use when burner 30 is in operation, air is drawn upwardly through opening 28 to provide secondary air for the flames burning at ports 40. Since opening 28 is relatively small the quantity of secondary air thus furnished is not adequate under all operating conditions. However, the upward draft of air and hot gases associated with the burner draws air inwardly into pan 16 through slots 48. As this air moves inwardly it is guided up sloped bottom 44 and directed toward the bases of ports 40. This flow of air supplements the upward flow through opening 28 and the combined flows provide adequate secondary air to the burner ports under all operating conditions.

Since slots 48 are disposed above distal portions 46 and adjacent portions of pan bottom 44 the pan serves its function of catching and retaining liquids or other material spilled thereinto.

Conventionally there is considerable clearance or tolerance between the various elements of a gas range such as pan 16, grate 22, support bracket 32, etc. It is possible for all or a number of these clearances to accumulate in one direction. Thus it would be possible without out tabs 50 for pan 16 and burner 30 to be positioned off-center from each other. Where opening 28 is in the smaller end of its diametral range this could result in virtually closing the opening between a localized area of the burner and opposed edge portion 47 with the result that the ports adjacent thereto would be starved for secondary air. Tabs 50 prevent such off-centering of the pan and burner and assure a proper upward flow of secondary air through opening 28.

The invention thus provides a burner-aeration pan combination wherein the burner can be kept closely adjacent to grate 22 for maximum thermal efficiency.
and which provides adequate secondary air to the burner even though opening 28 is reduced diametral to acceptably attractive proportions.

1 claim:

1. In an assembly of a gas burner disposed within a central opening in an aeration pan, the opening having a diameter greater than that of the burner to provide a clearance through which a flow of secondary air is furnished to the burner ports, the pan having a bottom with portions proximal to the burner which define said opening and portions distal of the burner which adjoin a generally vertical side wall, improved structure wherein,

said clearance is smaller than that required to pass adequate secondary air to the burner ports under at least certain conditions of operation of the burner,

said pan bottom extending upwardly from said distal portions to said proximal portions along a slope directed toward the burner ports,

said side wall being provided with aperture means above the level of said distal portions to admit a supplementary flow of secondary air into said aeration pan,

said sloped bottom being positioned and contoured to guide said supplementary secondary air upwardly and inwardly for delivery to flames issuing from said burner ports,

said flow through said clearance and said supplementary flow being cooperative to provide adequate secondary air to said burner ports under substantially all conditions of operation of said burner.

2. The structure defined in claim 1 wherein said opening has a diameter greater than that of said burner by about ¼ inch to about ½ inch.

3. The structure defined in claim 1 wherein said opening has a diameter of the order of about ¾ inch greater than that of said burner, said pan bottom and burner having means interengageable to maintain said burner in substantially centered relation within said opening.

4. The structure defined in claim 3 wherein said interengageable means comprises a plurality of tabs on said pan bottom projecting radially inwardly from said proximal portions and being engageable against side portions of said burner.

5. The structure defined in claim 1 wherein said side wall has a plurality of apertures distributed equally around the periphery of said side wall.

6. The structure defined in claim 5 wherein said apertures comprise circumferential slots extending around the major portion of said periphery.

7. The structure defined in claim 6 wherein said pan bottom has a plurality of tabs projecting radially inwardly from said proximal portions and positioned for engagement against side portions of said burner to maintain said burner in substantially centered relation within said opening.

8. The structure defined in claim 7 wherein said opening has a diameter of about ¼ inch greater than that of said burner.