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(12) # EUROPEAN PATENT APPLICATION

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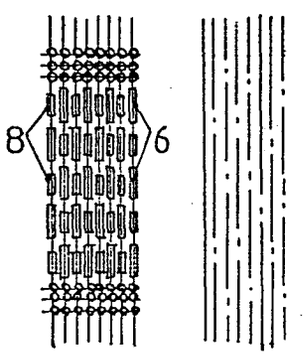
(54) **Gasburner.**

(57) The burner has a gas outflow aperture pattern improving the penetration of secondary air to the apertures, as well as small round apertures (7) as auxiliary gas structure. The pattern has longitudinal rows of slots (6) alternating with shorter slots (8) or round apertures (7) (Fig. 3, 4), or so alternating in pairs (figure 5).

Also transversely adjacent longitudinal rows have a phase shift such that no slots are directly successive in the transverse direction.



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Title: gasburner

The invention relates to a gasburner comprising a gas nozzle, a gas-air mixing tube adjacent thereto and a burner housing, in which in the top of said housing a pattern of transverse burner slots and burner apertures, positioned alternatingly therewith and having different dimensions from the slots, has been provided, said pattern repeating itself in the transverse direction of the burner, round apertures exclusively having been provided at both transverse ends of the pattern, the slots and apertures extending in rows in the longitudinal direction of the burner.

A similar burner is known from the British patent 1.462.985. Therein between the transverse slots of two adjacent longitudinal rows in the transverse direction each time three round apertures are provided, constituting a so-called auxiliary gas structure, whereby the gas leaving the slots ignits more easily and a more stabile burning is achieved.

However, it has been found that the access of secondary air to the gas leaving the slots is hindered in that said slots are close to each other in the longitudinal direction of the burner, e.g. at a spacing of 2 millimeters.

The invention aims at improving said supply of secundary air to the slots and thereby to further the burning process still more.

This is achieved according to the invention if the burner apertures are positioned in identical longitudinal rows of slots with each time between two successive slots one or more differently shaped apertures, which together have a smaller crosssection than one of said slots and wherein longitudinal rows which are adjacent in the transverse direction show a phase shift such that in the transverse direction of the burner no slots of adjacent longitudinal rows are directly adjacent to each other.

Thereby the secundary air may enter between the slots more easily while the auxiliary function of the smaller apertures remains.

A possibility to grant the apertures situated between the

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slots a smaller cross-section than the slots is present in an embodiment in which the burner apertures having the different dimensions are round apertures.

Another possibility is to manufacture the burner apertures having the different dimensions in the shape of shorter slots having a length which is substantially equal to 2/3 of the length of the first mentioned slots, the centre of each aperture being aligned,in the longitudinal direction of the burner, with that of the first mentioned slots.

In a preferred embodiment of the burner according to the invention the pitch or center-to-center spacing between successive transverse rows is in the range of 1.2 to 1.5 millimeters. Thereby concentrated generation of flames is obtained.

The invention will be further explained below with reference to the drawing showing some embodiments, given as examples, of the burner according to the invention.

Figure 1 is a plan view of a burner.

Figure 2 is a longitudinal section through said burner.

Figure 3 shows part of the burner apertures in the top of the burner.

Figure 4 shows differently shaped burner apertures.

Figure 5 shows a further possibility of the burner pattern.

The burner according to figures 1 and 2 comprises a burner housing 1 which generally is tubular and has closed end walls and may have an arbitrary crosssectional shape. In this figure a circular burner tube is shown. A gas-air mixing tube 2 is mounted coaxially within the housing 1 and in one end wall of the housing a gas nozzle 3 is mounted, likewise coaxial with the housing 1 and ending shortly before the beginning of the mixing tube 2.

In the top of the mixing tube 1 , as shown in phantom in figure 1, a predetermined pattern of burner apertures is provided, figure 1 only showing the pattern 4 at the beginning and at the end of the housing. Said pattern may be repeated at fixed spacing in the longitudinal direction of the housing 1, as also appears from figures 3 and 4.

Figure 3 shows a first possibility of the embodiment of the apertures pattern. There are identical longitudinal rows 5, in the embodiment according to figure 3 five of said longitudinal rows adjacent to each other. Each longitudinal row comprises rectangular slots 6 which are regularly alternated within this case three round apertures 7, the total crosssection of the apertures being smaller than that of a slot 6.

The rows 5 have mutually a phase shift such that adjacent to each slot 6 there are apertures 7. The pitch or centre to centre spacing between a row of apertures 7 and a slot 6 in each longitudinal row is constant and also the pitch between the round apertures 7 in the transverse direction of the burner is constant through all of the burner pattern.

Therewith the pattern is such that in the longitudinal direction as well as in the transverse direction never two slots are directly successive to each other, but between two slots a plurality of the smaller apertures 7 are provided. Thereby the secundary air may penetrate more easily to all slots while, due to the apertures, yet a so called auxiliary gas structure is present between the slots whereby the burning process is maintained in uniform manner and a stable burning process is achieved.

At the transverse end of each pattern exclusively rows of apertures 7 have been provided so that the secondary air may easily flow towards the apertures from the portion of the burner tube outside the gas emitting portion and also there auxiliary gas is provided. Each time between the burner apertures pattern in the longitudinal direction of the burner a portion of the burner is present having no apertures whatsoever in order that also from that side the secondary air can easily penetrate to the burner apertures.

Figure 4 shows a different burner pattern according to the invention. The difference with figure 3 is only that each three apertures 7 between the slots 6 have been replaced by shorter slots 7, having a length which is substantially equal to 2/3 of

the length of a slot 6 and the centre of which is in the longitudinal burner direction aligned with that of the slots 6. Also thereby the secondary air can more easily reach all slots 6.

Finally, according to figure 5 again an other pattern is possible. According to that pattern in each longitudinal row two slots 6 are directly successive which are followed by two series of three apertures 7, while also the phase shift in the transverse direction of the burner is present, in this case such that each time beside two slots there are two series of apertures.

It will be clear that within the scope of the invention also different patterns are possible wherein the slots may be more easily reached by the secondary air through auxiliary gas apertures than with the prior art.

As an example the following dimensions may be given: The slots 6 may have dimensions of 6 x 0,5 millimeters, the slots 8 dimensions of 4 x 0.5 millimeters and the round apertures a diameter of 0.8 millimeters. The spacing between successive slots or apertures in a longitudinal row is preferably 1.2 to 1.5 millimeters, whichspacing is indicated by X in figure 5. With this spacing sufficient secondary air may enter and yet a concentrated flame pattern is obtained.

The number of apertures in the transverse direction of the burner may be varied and depends on the heat capacity for which the burner is designed. Per pattern usually a longitudinal row has three to ten successive slots or aperture series respectively.

The burner is suitable for the gas families of natural gas, city gas and liquified gas.

C O N C L U S I E S

1. A gas burner comprising a gas nozzle (3), a gas-air mixing tube (2) adjacent thereto and a burner housing (1), a pattern (4) of transverse burner slots (6) and burner apertures (7, 8) having different dimensions, which are positioned alternatingly therewith, having been provided in the top of said housing, said pattern being repeated in the transverse direction of the burner, round apertures (7) exclusively being provided at both transverse ends of said pattern, the slots (6) being positioned in rows in the longitudinal direction of the burner, characterized in that the burner apertures are positioned in identical longitudinal rows of slots (6) with each time one or more differently shaped apertures (7, 8) between two successive slots, said differently shaped apertures having together a smaller crosssection than one of said slots (6), longitudinal rows which are adjacent in the transverse direction having a phase shift such that in the transverse direction of the burner no slots (6) of adjacent longitudinal rows are directly successive to each other.

2. Burner according to claim 1, characterized in that the burner apertures having different dimensions are round apertures (7).

3. Burner according to claim 1, characterized in that the burner apertures having different dimensions are shorter slots (8) having a length which is substantially equal to 2/3 of the length of the first mentioned slots (6), the centre of said shorter slots are aligned in the longitudinal burner direction with those of the first mentioned slots.

4. Burner according to one or more of the preceding claims, characterized in that the pitch distance (X) between successive transverse rows is in the range of 1.2 to 1.5 millimeters.

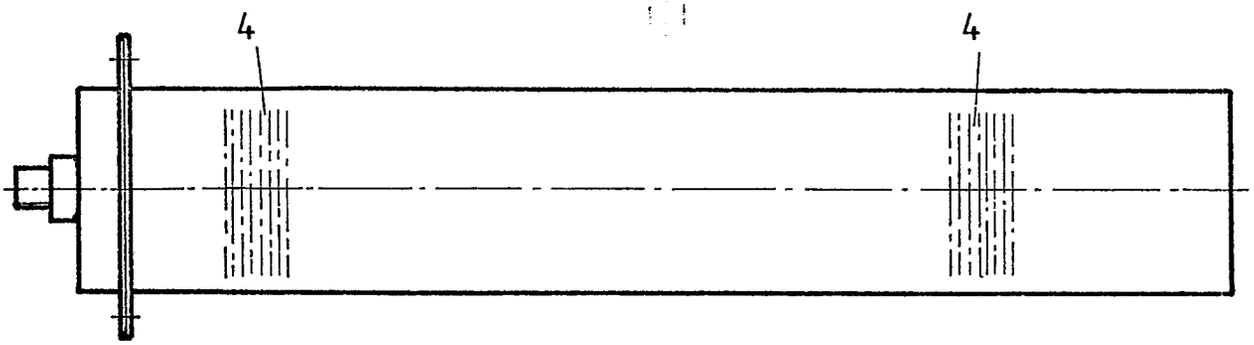

FIG. 1

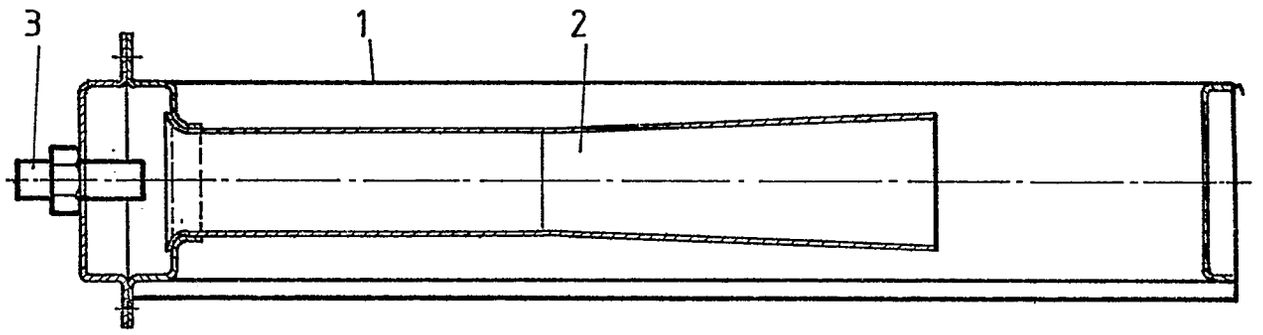

FIG. 2

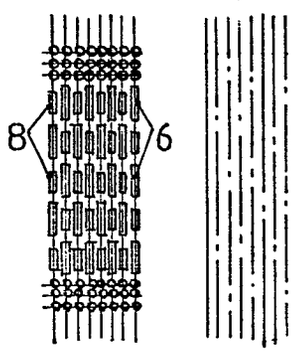

FIG. 4

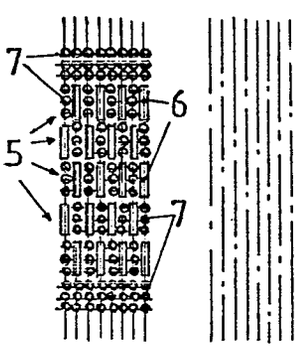

FIG. 3

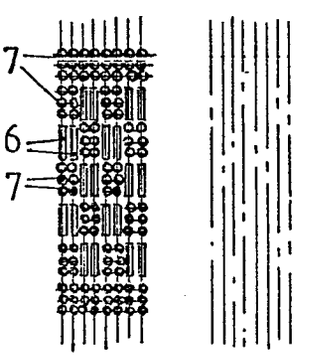

FIG. 5

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EUROPEAN SEARCH REPORT

0172945
Application number

EP 84 20 1223

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
Y,D	GB-A-1 462 985 (FURIGAS) * Page 2, lines 11-115; figures *	1-4	F 23 D 14/10 F 23 D 14/58
Y	GB-A-1 117 749 (VAILLANT) * Page 2, lines 14-16; page 2, lines 26-31; figure 2 *	1-4	
Y	EP-A-0 009 831 (POLIDORO) * Page 3, line 22 - page 4, line 8; figures 1,2 *	1-4	
A	GB-A-1 579 829 (GEO-BRAY)		

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

F 23 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	09-04-1985	KLEIN C.

CATEGORY OF CITED DOCUMENTS

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