(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 428 373 A3**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90312358.6**

(51) Int. Cl.5: **F23N 5/16**

(22) Date of filing: **13.11.90**

(30) Priority: **13.11.89 US 435948**

(43) Date of publication of application:
22.05.91 Bulletin 91/21

(84) Designated Contracting States:
DE GB IT

(88) Date of deferred publication of the search report:
28.08.91 Bulletin 91/35

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(54) Acoustical burner control system and method.

(57) An acoustically operated burner control system (1) for optimally controlling a flow of air and fuel into a flame producing combustion burner (3) throughout a range of firing rates is disclosed. The system includes separate valve assemblies for modulating the flow of air and fuel into a burner (3), a microphone (103) for generating an electrical signal indicative of the intensity of all sounds generated by the combustion flame having a frequency in excess of about 10 kHz, and a controller (43) including a programmable microprocessor electrically connected to both the air and fuel valve assemblies (45,58) and the microphone (103). The system further includes a wave guide (105) for remotely acoustically coupling the microphone (103) to the combustion flame (15) in order to isolate the microphone from both heat and corrosive combustion products. Prior to the operation of the system, empirically-derived sound intensities associated with optimum stoichiometric combustion and minimum pollution are entered into the memory of the microprocessor. During operation, the microprocessor equates the sound intensity sensed by the microphone with the optimum sound intensity in its memory by regulating the position of the air and fuel valve assemblies (45,58).

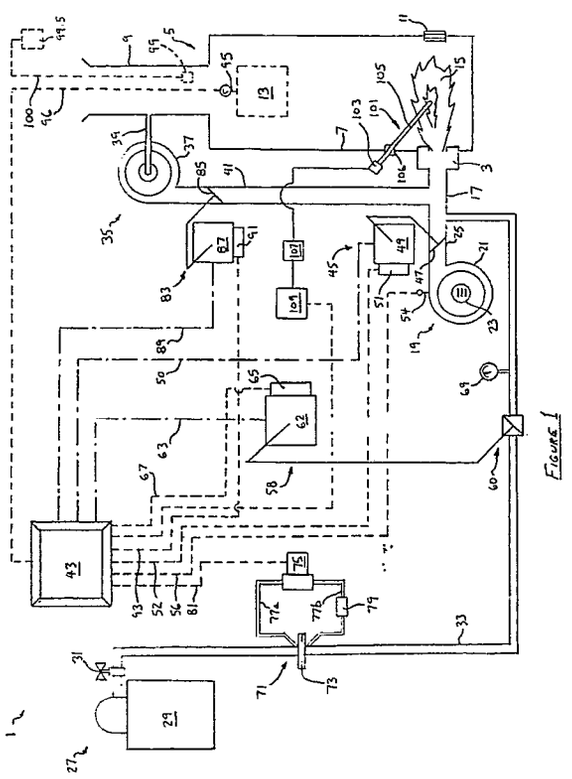

Figure 1

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EUROPEAN SEARCH REPORT

Application Number

EP 90 31 2358

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.5)
Y	GB-A-2 042 221 (KOBE STEEL) * The whole document *	1-4,6,7,13,14	F 23 N 5/16
Y	FR-A-2 215 583 (GENERAL ELECTRIC) * The whole document *	1-4,6,7,13,14	
A	GB-A- 861 564 (BABCOCK & WILCOX) * Page 1, line 61 - page 2, line 10; page 3, lines 10-89; figures *	1,13	
A	DE-A-2 063 363 (WESTINGHOUSE) * Pages 6-8; figures *	1,13	
A	FR-A-2 490 786 (CNRS) * The whole document *	1,13	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F 23 N

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
THE HAGUE	23-01-1991	KOOIJMAN F.G.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.

☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,

namely claims:

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

X LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,

namely:

1. Claims 1-9,12,13-17: Acoustical burner control system and method using the intensity of sound above 1 KHz in frequency.

2. Claims 10-12: Acoustical burner control system and method with monitoring means.

3. Claim 18: Acoustical burner control method using the intensity of sound above 10KHz in frequency.

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid,

namely claims:

☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,

namely claims: 1-9,12,13-17