



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**17.01.2018 Bulletin 2018/03**

(51) Int Cl.:  
**F23R 3/28 (2006.01) F23D 14/62 (2006.01)**

(43) Date of publication A2:  
**25.06.2014 Bulletin 2014/26**

(21) Application number: **13197012.1**

(22) Date of filing: **12.12.2013**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**

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(30) Priority: **19.12.2012 US 201213720118**

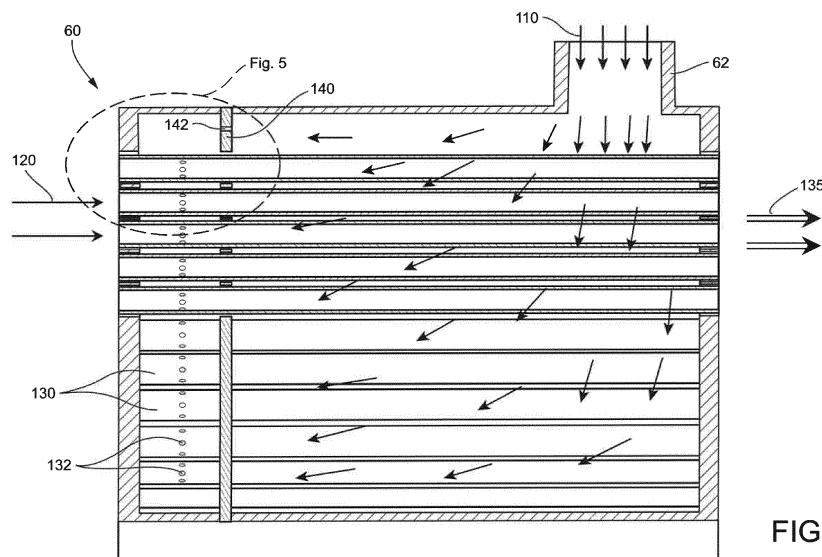
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(54) **Fuel distribution and mixing plate**

(57) A fuel flow passes through a micromixer 60 section of a gas turbine that includes a plurality of mixing tubes 130 for transporting a fuel/air mixture and a distribution plate 140 including a plurality of distribution holes 142 and a plurality of tube holes 144 for accommodating the mixing tubes 130. Each of the mixing tubes 130 includes a plurality of fuel holes 132 through which fuel enters the mixing tubes 130. The tube holes 144 and the mixing tubes 130 form a plurality of annulus areas 146

between the distribution plate 140 and the mixing tubes 130. The distribution holes 142 and the annulus areas 146 are configured to pass the fuel flow through the distribution plate toward the fuel holes. A flow management device modifies an effective size of the annulus areas to control a distribution of the fuel flow through the distribution holes and the annulus areas of the distribution plate to provide a uniform fuel/air composition in each of the mixing tubes.



**FIG. 4**



## EUROPEAN SEARCH REPORT

 Application Number  
 EP 13 19 7012

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 2 224 172 A2 (GEN ELECTRIC [US]) 1 September 2010 (2010-09-01)	1-8,14,15	INV. F23R3/28 F23D14/62
A	* paragraph [0030]; figures 2,5 * -----	9-13	
Y	US 4 712 370 A (MACGEE ANDREW [US]) 15 December 1987 (1987-12-15)	1-8,14,15	
A	* figure 2 * -----	1-15	
A	EP 2 216 599 A2 (GEN ELECTRIC [US]) 11 August 2010 (2010-08-11)	1-15	
A	EP 2 213 944 A2 (GEN ELECTRIC [US]) 4 August 2010 (2010-08-04)	1-15	
	* figure 7 * -----		
			TECHNICAL FIELDS SEARCHED (IPC)
			F23R F23D F28F
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		8 December 2017	Mendão, João
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			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 19 7012

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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08-12-2017

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2224172 A2	01-09-2010	CN 101818901 A	01-09-2010
		EP 2224172 A2	01-09-2010
		JP 5557521 B2	23-07-2014
		JP 2010203758 A	16-09-2010
		US 2010218501 A1	02-09-2010
-----			
US 4712370 A	15-12-1987	NONE	
-----			
EP 2216599 A2	11-08-2010	CN 101793400 A	04-08-2010
		EP 2216599 A2	11-08-2010
		JP 5432683 B2	05-03-2014
		JP 2010181137 A	19-08-2010
		US 2010192581 A1	05-08-2010
-----			
EP 2213944 A2	04-08-2010	CN 101818908 A	01-09-2010
		EP 2213944 A2	04-08-2010
		JP 5179525 B2	10-04-2013
		JP 2010175244 A	12-08-2010
		US 2010192579 A1	05-08-2010
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