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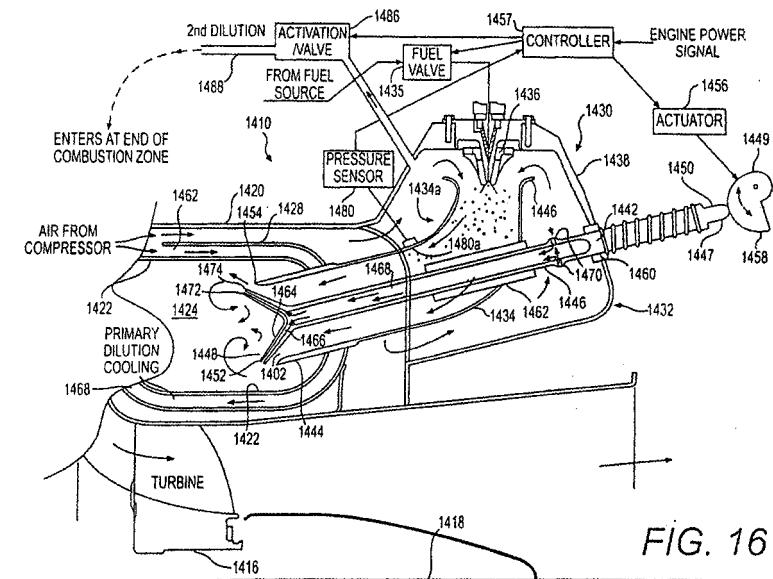
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### (54) Gas turbine engine fuel/air premixers with variable geometry exit and method for controlling exit velocities

(57) Apparatus (1430) for premixing fuel and air to provide a fuel/air mixture includes a mixing tube (1434) configured for receiving fuel and air, a mixing tube axis (1442), and a mixing tube exit (1454) for discharging a fuel/air mixture. The apparatus further includes a mixture valve (1444) associated with the mixing tube exit (1454) and including inner and outer valve members that define an exit flow area (1402). The defined exit flow area includes at least two segmented, substantially op-

posed area portions with respect to angular position about the mixing tube axis provided by contours in the outer valve member for directing the mixture flow, and at least one of the inner and outer valve members is movable relative to the other of the valve members to selectively vary the defined exit flow area with respect to time. In a gas turbine gas generator or engine application, a separate controllable combustion air valve can be used with a fuel valve to provide controlled fuel/air ratios for the mixture.





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## EUROPEAN SEARCH REPORT

Application Number  
EP 02 02 7665

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.7)						
X	EP 1 036 988 A (MOWILL ROLF JAN) 20 September 2000 (2000-09-20) * column 35, paragraph 0115 - column 46, paragraph 0155; figures 16-20 * -----	1-7	F23R3/28						
A	EP 0 831 275 A (MITSUBISHI HEAVY IND LTD) 25 March 1998 (1998-03-25) * the whole document *								
A	DE 33 06 892 A (KOESTER JOERG) 30 August 1984 (1984-08-30) * the whole document *								
A	WO 01/40713 A (MOWILL ROLF JAN) 7 June 2001 (2001-06-07) * the whole document *								
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)						
			F23R F23D						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 33%;">Examiner</td> </tr> <tr> <td>Munich</td> <td>16 March 2004</td> <td>Theis, G</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	Munich	16 March 2004	Theis, G
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Munich	16 March 2004	Theis, G							
CATEGORY OF CITED DOCUMENTS		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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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 02 02 7665

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-03-2004

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 1036988	A	20-09-2000	EP	1036988 A2	20-09-2000
			JP	2000304260 A	02-11-2000
			US	2002069645 A1	13-06-2002
			WO	0140713 A1	07-06-2001
<hr/>					
EP 0831275	A	25-03-1998	JP	10096516 A	14-04-1998
			DE	69724063 D1	18-09-2003
			EP	0831275 A2	25-03-1998
			US	5918459 A	06-07-1999
<hr/>					
DE 3306892	A	30-08-1984	DE	3306892 A1	30-08-1984
<hr/>					
WO 0140713	A	07-06-2001	EP	1036988 A2	20-09-2000
			WO	0140713 A1	07-06-2001
			JP	2000304260 A	02-11-2000
			US	2002069645 A1	13-06-2002
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