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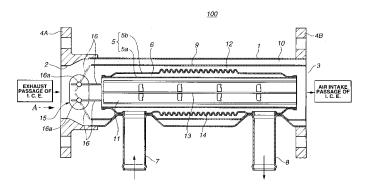
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(54) Exhaust gas recirculation device of internal combustion engine

(57) A first elongate casing (1) has gas inlet (2) and outlet ports (3) at axially opposed ends. A second elongate casing (5) is received in the first elongate casing (1) to define therebetween an axially extending space. The second elongate casing (5) includes a first gas flow passage (11) and a water flow passage (6) that surrounds the first gas flow passage (11). The first gas flow passage has an inlet part (2) exposed to the gas inlet port and an outlet part (3) exposed to the gas outlet port. A third elongate casing (9) is received in the axially extending space

to define between the first elongate casing and the third elongate casing a bypass passage (10) and between the third elongate casing and the second elongate casing a second gas flow passage (12). The bypass passage (10) and the second gas flow (12) passage have each an inlet part exposed to the gas inlet port and an outlet part exposed to the gas outlet port. A gas flow rate controller (15) is installed in either one of the gas inlet (2) and outlet (3) ports of the first elongate casing (1) to control a gas flow rate among the bypass passage (10), the first gas flow passage (11) and the second gas flow passage (12).

FIG.1



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EUROPEAN SEARCH REPORT

Application Number EP 05 00 0942

	Citation of document with indica	tion, where appropriate.	Relevant	CLASSIFICATION OF THE	
Category	of relevant passages		to claim	APPLICATION (IPC)	
Α	WO 03/098026 A1 (BEHR MERCZ JOZSEF [DE]; SZ/ GYU) 27 November 2003 * page 12, line 9 - pa figures 1-12 *	ABO ANDRAS [HU]; TOTH (2003-11-27)	1-20	INV. F02M25/07	
Α	WO 03/062625 A1 (BEHR ROSIN JUERGEN [DE]; BI [DE) 31 July 2003 (200 * page 6, line 1 - pag figures 1-6 *	RONISCHEWSKI BERNHARD 93-07-31)	1-20		
A,P	US 2004/107949 A1 (MIX AL) 10 June 2004 (2004 * paragraphs [0053] - [0088]; figures 1-20 *	4-06-10) [0057], [0086] -	1-20		
				TECHNICAL FIELDS	
				SEARCHED (IPC)	
	The present search report has been	drawn up for all claims			
Place of search		Date of completion of the search	Examiner		
	The Hague	12 July 2011	Raposo, Jorge		
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		E : earlier patent doo after the filing date D : document cited in L : document cited fo	T: theory or principle underlying the inventic E: earlier patent document, but published or after the filing date D: document cited in the application L: document cited for other reasons		
	-written disclosure rmediate document	& : member of the sar document	ne patent family	, corresponding	

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EP 05 00 0942

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12-07-2011

WO 03098026						date
	A1	27-11-2003	AT AU CN DE EP JP JP US	431498 2003242536 1653259 10321638 1509692 4473116 2005525505 2005199381 2010263610	A1 A1 A1 B2 A	15-05-2009 02-12-2003 10-08-2009 08-01-2009 02-03-2009 02-06-2010 25-08-2009 15-09-2009 21-10-2010
WO 03062625	A1	31-07-2003	CA CN DE EP JP MX US	2474065 1623033 10203003 1468184 2005515360 PA04007134 2006162706 2005039729	A A1 A1 A A A1	31-07-200 01-06-200 07-08-200 20-10-200 26-05-200 31-03-200 27-07-200 24-02-200
US 2004107949	A1	10-06-2004	EP WO JP	1467082 03060314 4065239	A1	13-10-200 24-07-200 19-03-200

FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82