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(54) A FUEL INJECTOR AND A FUEL INJECTION SYSTEM

(57) A fuel injector and a fuel injection system are disclosed. The fuel injector comprises a pressure sensor located in a recess in a manner such that a chamber is formed in recess between an end wall of the recess and said pressure sensor. The fuel injection system compris-

es at least two fuel injector and a pressure sensor located in the second fuel injector such that one pressure sensor is adapted to measure fuel pressure throughout the fuel injection system.

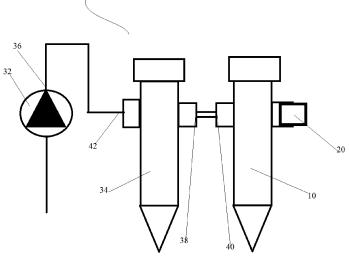


Figure 2



EUROPEAN SEARCH REPORT

Application Number EP 16 15 8652

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DOCUMENTS CONSIDERED TO BE RELEVANT	CLASSIFICATION OF THE APPLICATION (IPC) INV. F02M57/00		
X			
DIPING.) 13 April 1972 (1972-04-13)			
=====			
X WO 2011/085858 A1 (BOSCH GMBH ROBERT [DE]; 2 MAGEL HANS-CHRISTOPH [DE]) 21 July 2011 (2011-07-21)			
Y * figure 1 * 3-7			
Y DE 10 2007 035812 A1 (DENSO CORP [JP]) 14 February 2008 (2008-02-14) * figures 2,3 *			
Z5 DE 10 2005 012928 A1 (BOSCH GMBH ROBERT [DE]) 28 September 2006 (2006-09-28) * figures 1-8 *			
X,P EP 2 857 672 A1 (DELPHI INT OPERATIONS LUX 2	TECHNICAL FIELDS SEARCHED (IPC)		
SRL [LU]) 8 April 2015 (2015-04-08) * figure 1 *	F02M		
35			
40			
45			
The present search report has been drawn up for all claims			
Place of search Date of completion of the search 50	Examiner		
The Hague 24 January 2017	Morales Gonzalez, M		
The Hague 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 in the combined with another document, but after the filling date D: document cited in the apple in the combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying in the combined with another document, but after the filling date D: document cited for other reactions with another document in the apple in the same pater document.	ut published on, or lication easons		

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Application Number

EP 16 15 8652

	CLAIMS INCURRING FEES
	The present European patent application comprised at the time of filing claims for which payment was due.
10	Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
15	No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.
20	LACK OF UNITY OF INVENTION
	The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:
25	
20	see sheet B
30	
	All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
35	As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
40	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:
45	
	None 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 invention first mentioned in the claims, namely claims:
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55	The present supplementary 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 (Rule 164 (1) EPC).



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LACK OF UNITY OF INVENTION SHEET B

Application Number

EP 16 15 8652

5 The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely: 1. claim: 1 10 Fuel injector comprising a flow path and a recess provided in said injector body having a pressure sensor located in a manner respect to the recess. 15 2. claims: 2-7 Fuel injection system having a group of injector characterized in that a pressure sensor located in one of the injector to measure pressure throughout the fuel 20 injection system. 25 30 35 40 45 50

EP 3 076 003 A3

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

EP 16 15 8652

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.

24-01-2017

0		Patent document cited in search report			Publication Patent family date member(s)				Publication date
5		US	2012149256	A1	14-06-2012	DE JP JP US	102011055801 5257441 2012122394 2012149256	B2 A	09-08-2012 07-08-2013 28-06-2012 14-06-2012
		DE	2143476	A1	13-04-1972	AT CH DE	304102 531646 2143476	Α	27-12-1972 15-12-1972 13-04-1972
0		WO	2011085858	A1	21-07-2011	CN DE EP WO	102667134 102009055129 2516839 2011085858	A1 A1	12-09-2012 30-06-2011 31-10-2012 21-07-2011
5		DE	102007035812	A1	14-02-2008	DE JP	102007035812 2008064732		14-02-2008 21-03-2008
5		DE	102005012928	A1	28-09-2006	AT CN DE EP JP KR US WO	448402 101163879 102005012928 1864014 4651057 2008533387 20070110377 2008184962 2006100142	A A1 A1 B2 A A A	15-11-2009 16-04-2008 28-09-2006 12-12-2007 16-03-2011 21-08-2008 16-11-2007 07-08-2008 28-09-2006
		EP	2857672	A1	08-04-2015	NON	VE		
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5	FORM P0459								

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