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- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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(54) Title: FLUIDS DETECTION SENSOR AND RAIL, IN PARTICULAR FOR AUTOMOTIVE FUELS

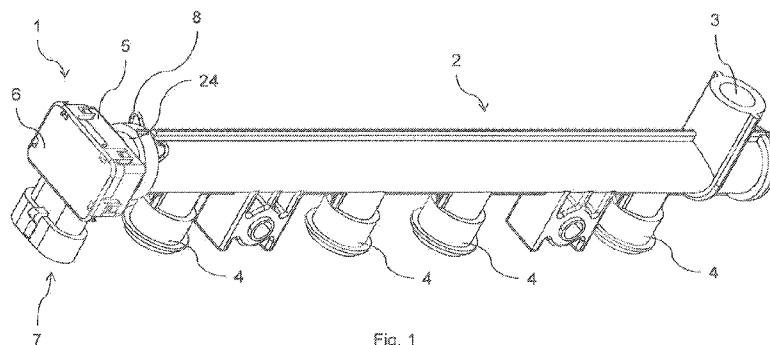


Fig. 1

(57) Abstract: The invention relates to a sensor for detecting the properties of the fuel of an internal combustion engine. The sensor comprises at least one pair of internal electrodes (12, 13) extending in an axial direction relative to a further or third external electrode (14) which surrounds them. The invention also relates to a fuel rail (2) to which the sensor may be mounted, and a method for detecting the properties of the fluid.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2012/051408

A. CLASSIFICATION OF SUBJECT MATTER

INV. G01N27/08 G01N27/22 G01N33/28 G01N33/22
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G01N F02M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/153154 A1 (HERNANDEZ NORBERTO [MX] ET AL) 18 June 2009 (2009-06-18)	1-9,12
A	paragraphs [0034], [0035], [0058], [0059]; figures 1,2,5,7,10,12	10,11,13-16
X	US 4 905 655 A (MAEKAWA HIROKO [JP]) 6 March 1990 (1990-03-06)	1-16
	column 3, line 46 - column 5, line 57; figures 2,3	
X	US 2008/295804 A1 (MATAS SCOTT E [US] ET AL) 4 December 2008 (2008-12-04)	12,13
	paragraph [0032] - paragraph [0033]; figure 4	
	----- -/-	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2012/051408

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/141882 A1 (ZOU LIAN Q [US] ET AL) 31 July 2003 (2003-07-31) paragraph [0020] - paragraph [0030]; figures 5-7 -----	1-16
A	US 5 140 965 A (NOGI TOSHIHARU [JP] ET AL) 25 August 1992 (1992-08-25) column 7, line 44 - column 8, line 7; figure 16 -----	1-16
X	US 4 939 468 A (TAKEUCHI KIYOSHI [JP]) 3 July 1990 (1990-07-03) -----	14,15
A	column 1, line 40 - column 2, line 7; figures 7-12 -----	1-13,16
A	US 4 555 661 A (BENSON WARREN E [US] ET AL) 26 November 1985 (1985-11-26) abstract; figure 3 -----	1-16
X	US 6 057 693 A (MURPHY J BRIAN [US] ET AL) 2 May 2000 (2000-05-02) -----	14,15
A	column 4, line 32 - column 6, line 2; figures 2-4 -----	1-13,16
X	EP 1 443 207 A2 (DELPHI TECH INC [US]) 4 August 2004 (2004-08-04) -----	12,13
A	the whole document -----	1-11, 14-16
A	US 2010/300406 A1 (HARVEY WILLIAM T [US] ET AL) 2 December 2010 (2010-12-02) abstract; figures 1,2 -----	10-13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2012/051408

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US 2010300406	A1	02-12-2010	NONE			

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2012/051408

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9, 14-16(completely); 12(partially)

Configuration of electrodes

2. claims: 10, 11, 13(completely); 12(partially)

Adaptation of sensor for removable attachment to fuel rail
and corresponding fuel rail
