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(71) Applicant: **MAGNETI MARELLI S.p.A.**
I-20145 Milano (IT)

(72) Inventor: **De la Pierre, Piero**
I-10014 Caluso (Torino) (IT)

(74) Representative: **Quinterno, Giuseppe et al**
c/o JACOBACCI & PERANI S.p.A.
Corso Regio Parco, 27
10152 Torino (IT)

(54) **Synchronisation device without a cam-position sensor for an internal combustion engine**

(57) A method for generating a synchronising signal over 720° for an internal combustion engine without the use of a cam sensor but with the use of alternative strategies, for example, by detecting the duration of the spark in a reference cylinder or the correlation of the engine acceleration with the throttle valve angle.

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EUROPEAN SEARCH REPORT

Application Number
EP 95 11 5292

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.6)
X	WO-A-92 03655 (BOSCH GMBH ROBERT) 5 March 1992	1,5,8,9	F02P17/12 F02P15/08 F02P7/02
Y	* page 1, line 14 - line 15; claim 2; figure 3 * * page 4, line 23 - page 7, line 28 *	2,6,7,10	
Y	DE-A-40 33 148 (MITSUBISHI ELECTRIC CORP) 25 April 1991	2	
A	* abstract; figure 1 *	8,9	
Y	DE-A-42 42 419 (BOSCH GMBH ROBERT) 23 June 1994	10	
	* abstract *		
A	US-A-5 174 267 (DEBIASI CHARLES J) 29 December 1992	1-5,9	
	* abstract; figure 1 *		
Y	DE-A-42 29 773 (BOSCH GMBH ROBERT) 10 March 1994	6,7	
	* the whole document *		
A	PATENT ABSTRACTS OF JAPAN vol. 013 no. 489 (M-888) ,7 November 1989 & JP-A-01 195975 (MITSUBISHI MOTORS CORP) 7 August 1989, * abstract *	6,7	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F02P
Place of search		Date of completion of the search	Examiner
THE HAGUE		11 March 1996	Michels, J
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)



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,
namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,
namely:

see sheet -B-

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ 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 respects of which search fees have been paid,
namely claims:
- ☐ None of the further search fees has 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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LACK OF UNITY OF INVENTION - A POSTERIORI -

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-5,8-11:

A method for synchronising an engine by comparing a physical quantity indicative of cylinder pressure at one cylinder at two angular positions (360° out of phase).

2. Claims 6,7:

A method for synchronising an engine by generating a random ignition at 720° and detecting the acceleration of the engine.