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(54) **Switch mode ignition coil driver and method.**

(57) A switch mode ignition coil driver includes a means (113) for sensing flyback voltage (195) at the primary winding (103) of the ignition coil (102), and providing a flyback sense voltage (118) indicative of the flyback voltage (195). A means (147) senses current (193) in the primary winding (103) of the ignition coil (102) and provides a current sense voltage (149) indicative of the sensed primary winding current (193). Control means (105, 119, 129, 137, 151) is coupled to the means (113) for sensing flyback voltage (195) and the means (147) for sensing current for providing an increasing current through the primary winding (103) of the ignition coil (102) when the flyback sense voltage (118) exceeds a predetermined limit and decreasing this current through the primary winding (103) of the ignition coil (102) when the current sense voltage (149) exceeds another predetermined limit. Further, a corresponding method is disclosed.

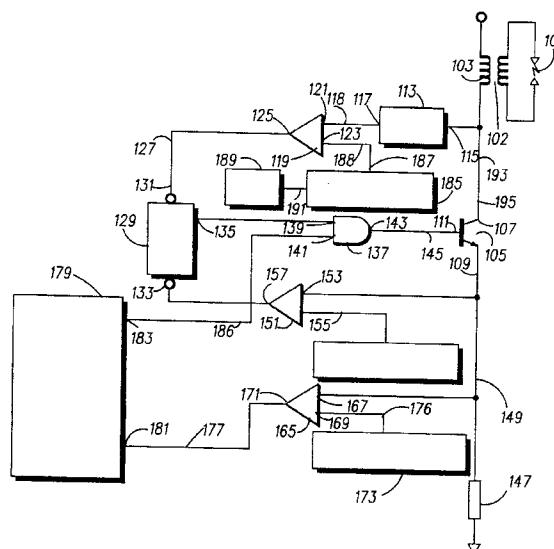


FIG.1



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EUROPEAN SEARCH REPORT

Application Number
EP 93 30 2809

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.5)
X	US-A-4 944 281 (SUQUET)	1-5, 11, 12	F02P3/05
A	* the whole document * ---	7, 8	F02P3/055
X	GB-A-2 024 941 (ROBERT BOSCH GMBH)	1-5, 11, 12	F02P3/045
A	* the whole document * ---	7, 8	
P, A	EP-A-0 526 219 (MOTOROLA INC.) * column 3, line 9 - column 4, line 8; figure 2 * ---	1-5, 7, 8, 11, 12	
A	EP-A-0 447 975 (MARELLI AUTRONICA S.P.A.) * abstract; figures * -----	1-3, 7, 8, 11	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			F02P
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 May 1994	Examiner MICHELS J.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p> <p>..... & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 CL.92 (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 respect 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: 1-5, 7, 8, 11, 12



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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 1-5,7,8,11,12: Ignition coil driver and method to regulate the primary current at its limit value
2. Claim 6: Primary flyback voltage reference value proportional to supply voltage
3. Claims 9,10,13,14: Ignition coil driver and method to control dwell time in dependence on initial primary current detection as belonging to claims 1 or 11