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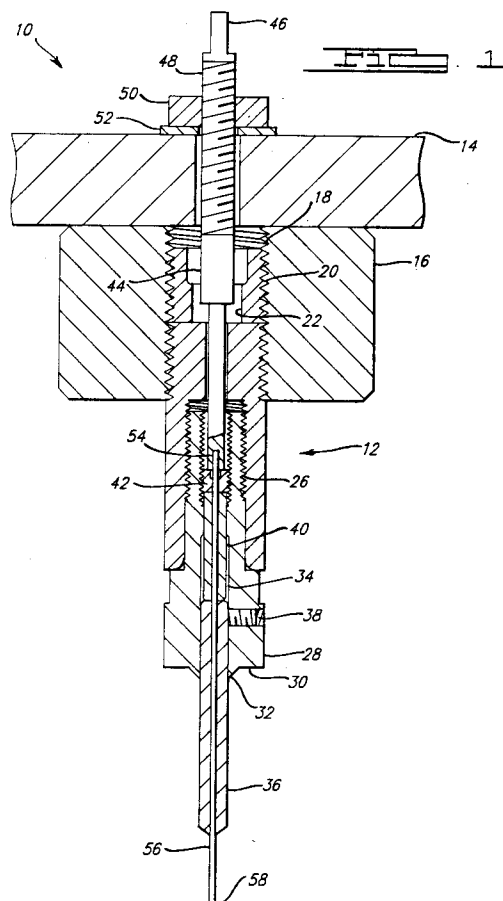
(11) Publication number:

0 386 941 A3

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **90302191.3**(51) Int. Cl.⁵: **H01T 13/40, H01T 21/02**(22) Date of filing: **01.03.90**(30) Priority: **06.03.89 US 320107**(43) Date of publication of application:
12.09.90 Bulletin 90/37(84) Designated Contracting States:
AT BE CH DE ES FR GB IT LI NL SE(88) Date of deferred publication of the search report:
08.04.92 Bulletin 92/15(71) Applicant: **McDOUGAL, John A.**
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Detroit, MI 48215(US)(74) Representative: **Williams, Trevor John et al**
J.A. KEMP & CO. 14 South Square Gray's Inn
London WC1R 5LX(GB)(54) **Spark plug and method.**

(57) A spark plug with integral electrical components for producing a spark with an increased size and a larger resulting flame kernel in an internal combustion engine. One or more coils may be built into the spark plug for creating a magnetic field in the vicinity of the spark. This magnetic field has the effect of bending and rotating the spark in a circular motion. Also, a capacitor may be incorporated into the spark plug to increase the intensity of the spark. A method of producing such a spark plug utilizes a cermet ink applied to the ceramic spark plug insulator before the insulator is completely hardened. The cermet ink may be used to create monolithic spark plug electrodes, integrated coils and integrated capacitors. The method may also be used to create monolithic electrically conductive paths through any solid dielectric material.

**EP 0 386 941 A3**



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 2191

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-4 402 036 (HENSLEY) * Column 7, line 31 - column 8, line 40, figure 10 *	1,11	H 01 T 13/40 H 01 T 21/02
X	GB-A-2 199 075 (TOZZI) * Claim 1 *	1,2,35-38	
A	FR-A-1 026 595 (CIE GEN. DE TELEGRAPHE SANS FIL) * Page 2, right-hand column, lines 26-29, figure 3 *	1,2	
A	EP-A-0 225 713 (GENERAL MOTORS CORP.) * Column 5, line 38 - column 7, line 46, figures 1-10 *	5-9,46-48	
A	US-A-4 161 937 (GERRY)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H 01 T F 02 P H 01 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-09-1991	Examiner BIJN E.A.
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	



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: 1-26, 35-53



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:

1. Claims 1-26, 35-53:

Spark plug with electrically conductive path
means for producing a magnetic field and method of
making

2. Claims 27-34, 55-63:

Spark plug with plate means forming a capacitor
and method of making

3. Claim 54:

Method of making a precious metal center electrode
of a spark plug

4. Claim 64:

Spark plug capable of forming a resonant circuit