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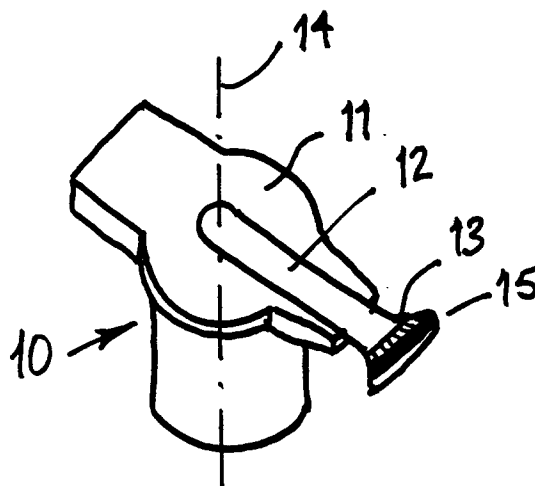
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High Holborn
London WC1V 6DE(GB)(54) **Improvements in rotating spark distributors for a spark-fired ic engine.**

(57) A rotor arm distributor (10) is improved by adding a layer of tin or brass or an alloy of tin and brass on the conducting plate (12) at the tip (13) of a conventional rotor arm such that the "contact" area with the stationary metal contact in the distributor cover is increased and the electrical current conducted to the spark plug results in a stronger spark giving rise to improved combustion of fuel, increase in the power output of the engine, a fuel saving of between 5% to 10% and a reduction in air pollution.

**FIG. 2****EP 0 525 945 A1**

This invention relates to an improvement in a rotor arm of a distributor of a spark-fired internal combustion (IC) engine which is intended to increase the horsepower of the engine and at the same time to economise on the fuel consumption of the engine.

A distributor rotor functions to distribute electrical current to spark plugs of an IC engine causing them to ignite fuel vapour in the cylinders of the engine and put the engine in motion. The rotor is usually made of a plastics core and a conducting plate (usually a brass plate) secured thereto. Generally, the thickness of the conducting plate is less than 1.7 millimetres and its design has changed little over many years.

The rotor arm rotates within a ring of stationary contacts (usually one for each cylinder of the engine) whereby current at high voltage fed to the axis of the rotor arm can spark across between the outer tip of the conducting plate and each stationary contact in turn as the rotor arm turns during operation of the engine.

With the widespread use of spark-fired IC engines in motor vehicles, any improvement in power output and/or fuel economy of the engines is widely sought. This invention promises improved performance of a spark-fired IC engine by means of a simple but unobvious modification of the distributor rotor, a cheap, readily-changeable spare part of such engines.

The invention concerns the provision of an increased edge area of the tip of the conducting plate of the rotor arm. Conveniently the edge of the tip includes a layer of tin or an alloy of tin and brass. By means of the invention the area of the conducting plate available for current transmission when the rotor arm revolves within the ring of stationary metal contacts in the distributor cap is increased thus allowing a stronger electrical current to be conducted to the spark plugs. This additional layer may be about 1.5 millimetres thick.

A rotor arm improved in accordance with this invention has been found to produce a more powerful spark at the plug and thus better combustion and cleaner engine running with a consequent increase in engine horsepower, between 5% to 10% improvement in fuel combustion and reduced air pollution from the engine exhaust gases.

The invention will now be further described, by way of example, with reference to the accompanying drawing, in which:-

Figure 1 is a view of a conventional rotor arm, and

Figure 2 is a view of a rotor arm in accordance with this invention.

The rotor arm 10 shown in Figure 1 consists of an electrically-insulating core support 11 (e.g. of ebonite) carrying an electrically-conducting radial

plate 12 (e.g. of brass) having a tip 13. High voltage for firing each spark plug is led to the radially inner end of the plate 12 and passes through the plate to spark across from the tip 13 to a stationary contact (not shown) as each spark plug is energised in turn as the rotor arm 10 rotates about the axis 14. The plate 12 would typically be of 1.5 millimetres thickness at the tip.

The rotor arm 10 shown in Figure 2 differs from that shown in Figure 1 only by the provision of an extension 15 to the tip 13. The extension 15 is of tin or a tin/brass alloy which is at least as thick as the plate 12 at the tip 13 and has a radial extension of between 1 and 2 millimetres and has an extension in the circumferential direction of travel of the arm which substantially matches that of the tip 13. The ratio of tin to brass in the alloy can be about 50:50%.

In a modification, the extension 15 is of brass but has a thickness in the axial direction of the core support 11 between 1.75 millimetres and at least 3.0 millimetres.

Claims

1. A rotor arm distributor (10) for a spark-fired IC engine **characterised in that** it comprises a conducting plate (12) including tin at least in the tip (13, 14).
2. A rotor arm as claimed in claim 1, **characterised in that** the tip includes a tin layer (14) on the tip (13) of a brass plate (12).
3. A rotor arm as claimed in claim 2, **characterised in that** the tin layer (14) is 1 to 2 mm thick, 2 mm long and with a circumferential extension which is the same as that for a conventional rotor arm (10).
4. A rotor arm (10) as claimed in claim 1, **characterised in that** the conducting plate (12) of the rotor arm (10) is made of an alloy of tin and brass.
5. A rotor arm (10) as claimed in claim 4, **characterised in that** the ratio of tin to brass in the alloy is substantially 50% tin to 50% brass.
6. A rotor arm (10) as claimed in any one preceding claim, **characterised in that** the conducting plate (12) of the rotor arm is brass of a thickness at the tip (13) of between 1.75 mm and at least 3 mm.
7. A rotor arm (10) as claimed in any one preceding claim, **characterised in that** it is utilised

for the engine of a motor vehicle.

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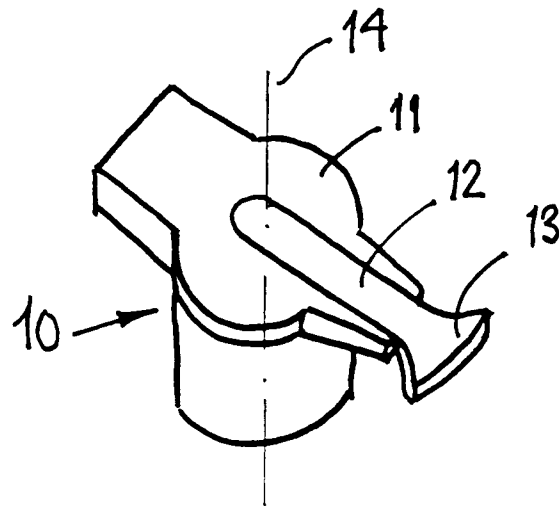


FIG. 1

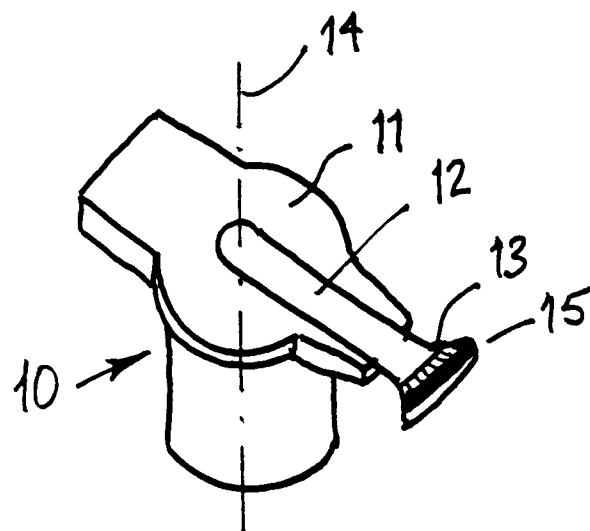


FIG. 2



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EUROPEAN SEARCH REPORT

Application Number

EP 92 30 4727

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)
A	CH-A-211 175 (ROBERT BOSCH GMBH) * page 1, left column, line 1 - page 2, left column, line 13 *	1,7	F02P7/02
A	--- PATENT ABSTRACTS OF JAPAN vol. 8, no. 116 (M-299)(1533) 30 May 1984 & JP-A-59 023 074 (NIPPON DENSO) 6 February 1984 * abstract *	1,7	
A	--- PATENT ABSTRACTS OF JAPAN vol. 13, no. 317 (E-789)19 July 1989 & JP-A-01 086 417 (FURUKAWA) 31 March 1989 * abstract *	1	
			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 24 AUGUST 1992	Examiner WENTZEL J, F.
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	