



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 834 699 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
07.06.2000 Bulletin 2000/23

(51) Int. Cl.⁷: **F23Q 7/00**

(43) Date of publication A2:
08.04.1998 Bulletin 1998/15

(21) Application number: **97117142.6**

(22) Date of filing: **02.10.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV RO SI

(30) Priority: **04.10.1996 JP 26472196**

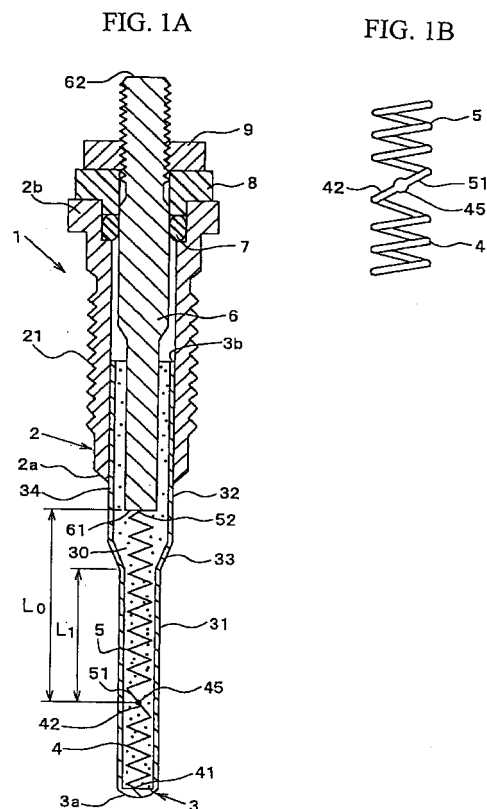
(71) Applicant: **DENSO CORPORATION**
Kariya-City Aichi-Pref. 448 (JP)

(72) Inventors:
• **Koyama, Taiji**
Kariya-city, Aichi-Pref. 448 (JP)
• **Ishii, Hirohisa**
c/o Denso Corporation
Kariya-city, Aichi-Pref. 448 (JP)

(74) Representative: **Kuhnen & Wacker**
Patentanwalts-gesellschaft mbH,
Alois-Steinecker-Strasse 22
85354 Freising (DE)

(54) **Glow plug**

(57) A heater tube (3) comprises a smaller-diameter portion (31) and a larger-diameter portion (32). A first resistor (4) and a second resistor (5) are provided in the heater tube (3). The second resistor (5) has a positive resistance-temperature coefficient larger than that of the first resistor (4). The first resistor (4) and the second resistor (5) are electrically connected in series. The entire body of the first resistor (4) and 3/4 of the second resistor (5) are accommodated in the smaller-diameter portion (31).





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 11 7142

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	DE 40 01 296 A (JIDOSHA KIKI CO) 16 August 1990 (1990-08-16) * column 3, line 40 - line 64; figures * -----	1,2	F23Q7/00
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F23Q
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 April 2000	Examiner Vanheusden, 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)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 97 11 7142

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

12-04-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 4001296 A	16-08-1990	JP 2217717 A	30-08-1990
		JP 2745225 B	28-04-1998
		US 5039839 A	13-08-1991

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82