

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 089 593 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
28.08.2002 Bulletin 2002/35

(51) Int Cl. 7: H05B 3/14, H05B 3/28,
H01L 21/00, H01L 21/68

(43) Date of publication A2:
04.04.2001 Bulletin 2001/14

(21) Application number: 00308583.4

(22) Date of filing: 29.09.2000

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE

Designated Extension States:
AL LT LV MK RO SI

(30) Priority: 01.10.1999 JP 28111599

(71) Applicant: NGK INSULATORS, LTD.
Nagoya-City, Aichi Prefecture 467-8530 (JP)

(72) Inventors:
• Yamada, Atsuo, c/o NGK Insulators, Ltd.
Nagoya City, Aichi Pref. (JP)
• Yamaguchi, Shinji, c/o NGK Insulators, Ltd.
Nagoya City, Aichi Pref. (JP)

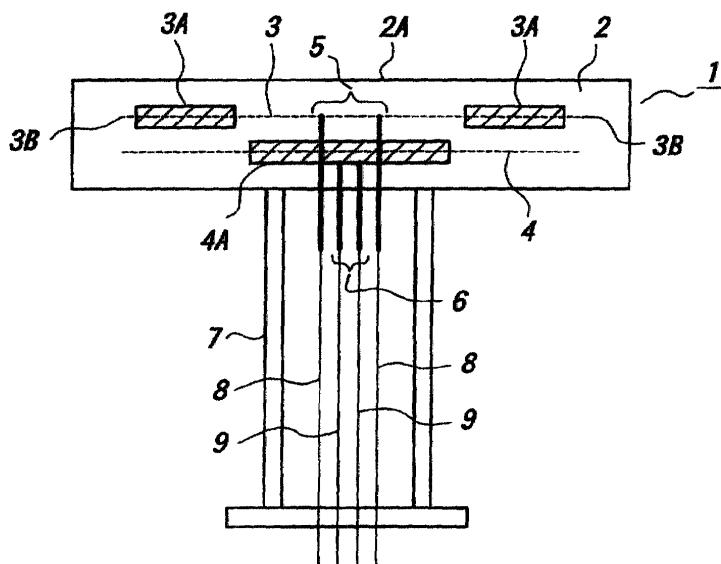
(74) Representative: Paget, Hugh Charles Edward et al
MEWBURN ELLIS
York House
23 Kingsway
London WC2B 6HP (GB)

(54) Ceramic heater

(57) A ceramic heater comprising a ceramic substrate having a heating face, and a resistance heat generator buried in the ceramic substrate, wherein the resistance heat generator comprises plural planar resistance heating elements arranged in a layered fashion as

viewed in a thickness direction of the ceramic substrate, and each of said plural planar heating elements comprises a heat generation density-increased portion, and the heat generation density-increased portions of the respective plural planar heating elements are located in different portions, respectively.

FIG. 1





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.7)						
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 02, 28 February 1997 (1997-02-28) & JP 08 274147 A (KYOCERA CORP), 18 October 1996 (1996-10-18) * abstract * & JP 08 274147 A (KYOCERA CORP) 18 October 1996 (1996-10-18) * figures 1-3 *	1, 2, 4, 6, 8, 10	H05B3/14 H05B3/28 H01L21/00 H01L21/68						
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 01, 31 January 1997 (1997-01-31) & JP 08 236599 A (KYOCERA CORP), 13 September 1996 (1996-09-13) * abstract *	1, 2, 4, 6, 8, 10							
X	& JP 08 236599 A (KYOCERA CORP) 13 September 1996 (1996-09-13) * figure 1 *	1, 2, 4, 6, 8, 10							
D, A	US 5 331 134 A (KIMURA NOBORU) 19 July 1994 (1994-07-19) * abstract * * column 1, line 58-68 * * claim 1 * * figure 2 *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.7) H05B H01L						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>24 May 2002</td> <td>D/L TASSA LAFOR.., J</td> </tr> </table>				Place of search	Date of completion of the search	Examiner	THE HAGUE	24 May 2002	D/L TASSA LAFOR.., J
Place of search	Date of completion of the search	Examiner							
THE HAGUE	24 May 2002	D/L TASSA LAFOR.., J							
CATEGORY OF CITED DOCUMENTS		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							
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									

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

EP 00 30 8583

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.

24-05-2002

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
JP 08274147	A	18-10-1996	US	6133557 A	17-10-2000
JP 08236599	A	13-09-1996	US	6133557 A	17-10-2000
US 5331134	A	19-07-1994	JP	5326112 A	10-12-1993