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(54) **CERAMIC HEATER AND GLOW PLUG**

(57) [Objective] To reduce the specific resistance of a heat-generating resistor of a ceramic heater while ensuring the strength of the ceramic heater and to suppress the occurrence of cracks in the heat-generating resistor.

[Means for Solution] The ceramic heater 100 includes a substrate 10 formed from an insulating ceramic and a heat-generating resistor 20 formed inside the sub-

strate 10 and containing tungsten carbide (WC) and silicon nitride (Si₃N₄). In any cross section of the heat-generating resistor 20, the ratio of the area of tungsten carbide portions to the total area of the cross section is 33 to 67%, and the average diameter of tungsten carbide aggregates that is measured by a line intercept method is 1.4 to 7.0 μm.

	WC (mass%)	Diameter of WC raw material particles (μm)	Firing time (min.)	Area ratio of WC (%)	Diameter of WC aggregates (μm)	Diameter of silicon nitride particles (μm)	Specific resistance	Component strength	Crack occurrence rate	Overall rating
Sample 1	67	0.7	60	28	1.4	1.1	C	A	AA	C
Sample 2		0.5	60		1.1	1.1	A	A	B	B
Sample 3			60			1.0	A	A	AA	AA
Sample 4		0.7	120		1.4	4.5	A	A	A	A
Sample 5			60			1.4	A	A	AA	AA
Sample 6	73	2.5	120	33	3.5	4.5	A	A	A	A
Sample 7			90		7.0	2.9	A	A	AA	AA
Sample 8		3.5	150			7.4	A	A	A	A
Sample 9		5.1	150		8.9	7.4	A	C	A	C
Sample 10		0.5	60		1.0	1.2	A	A	C	C
Sample 11			60			1.2	A	A	AA	AA
Sample 12		0.7	90		1.4	3.1	A	A	A	A
Sample 13			60			1.4	A	A	AA	AA
Sample 14	77	2.5	120	50	3.5	5.0	A	A	A	A
Sample 15			60		7.0	1.7	A	A	AA	AA
Sample 16		3.5	150			7.5	A	A	A	A
Sample 17		5.1	150		10	8.0	A	C	A	C
Sample 18			90			2.1	A	A	AA	AA
Sample 19		0.7	120		1.4	5.6	A	A	A	A
Sample 20			60			1.4	A	A	AA	AA
Sample 21	85	2.5	120	67	3.5	5.0	A	A	A	A
Sample 22			90		7.0	2.9	A	A	AA	AA
Sample 23		3.5	150			7.3	A	A	A	A
Sample 24		5.1	180		11	9.1	A	C	A	C
Sample 25	90	3.0	120	72	7.0	4.5	A	C	C	C

FIG. 4



EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 February 2017	Examiner Theis, Gilbert
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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