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(54) Title: HEATING CABLE WITH A HEATING ELEMENT POSITIONED IN THE MIDDLE OF BUS WIRES

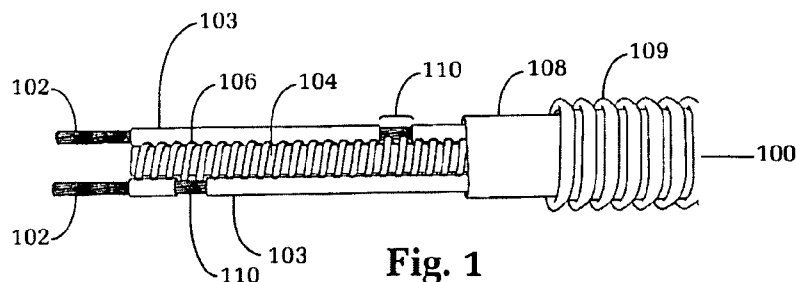


Fig. 1

(57) Abstract: Particular embodiments generally relate to a heating cable that includes a plurality of bus wires positioned on the outside of a heating element. In one embodiment, a spacer is provided. A heating element is included on a surface of the spacer. The heating element also includes one or more resistance wires. A plurality of bus wires are positioned on the edges of the spacer that has the heating element wrapped around it. For example, a first bus wire is positioned on a first side of the spacer and a second bus wire is positioned on a second side of the spacer. A plurality of node areas (e.g., on the bus wires or on an insulated heating element) allow a resistance wire of the heating element to be electrically coupled to the bus wires at the plurality of node areas on alternating bus wires.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/044234**A. CLASSIFICATION OF SUBJECT MATTER****H05B 3/56(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC : H05B 3/56; B65D 1/24; H01L 39/24; H05B 3/10; H05B 3/34

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models since 1975.
Japanese utility models and applications for utility models since 1975.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: (heat*, thermal*), (tracing*, trace*, cable*), (spacer*, support*, pillar*, post*, middle*, insid*, inner*, interior*, center*, gap, between*, position*, dispos*, arrang*, place*), (resist*, bus*, wire*, conduct*)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4864107 A1 (BOYAL, MOHAN S.) 05 September 1989 See figures 1-5; column 2 lines 47-58	1-19
Y	US 6005232 A1 (JANVRIN, ARON K. et al.) 21 December 1999 See figures 1-6; column 6 lines 30-40	1-19
A	US 4733059 A1 (GOSS, DAVID C. et al.) 22 March 1988 See figures 7-9; column 5 lines 10-20	1-19
A	KR 20-0414017 Y1 (YOUNG CHANG SILICONE CO., LTD.) 13 April 2006 See figure 2; page 3	1-19
A	US 2006-0089264 A1 (HONG, SEUNGOK.) 27 April 2006 See abstract; figure 2	1-19

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4864107 A1	05.09.1989	None	
US 6005232 A1	21.12.1999	CA 2260189 C CN 1132502 C CN 1223782 A CN 1223782 A0 EP 1016321 A1 EP 1016321 A1 EP 1016321 B1 EP 1016321 B1 KR 10-0497692 B1 WO 1998-001010 A1	07.12.2004 24.12.2003 21.07.1999 21.07.1999 05.07.2000 05.07.2000 26.05.2004 26.05.2004 09.09.2005 08.01.1998
US 4733059 A1	22.03.1988	EP 0295359 A2 EP 0295359 A2 EP 0295359 A3 EP 0295359 B1 EP 0295359 B1 EP 0475458 A2 EP 0475458 B1 JP 63-313490 A JP 63-313490 A	21.12.1988 21.12.1988 11.04.1990 14.04.1993 14.04.1993 18.03.1992 14.09.1994 21.12.1988 21.12.1988
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