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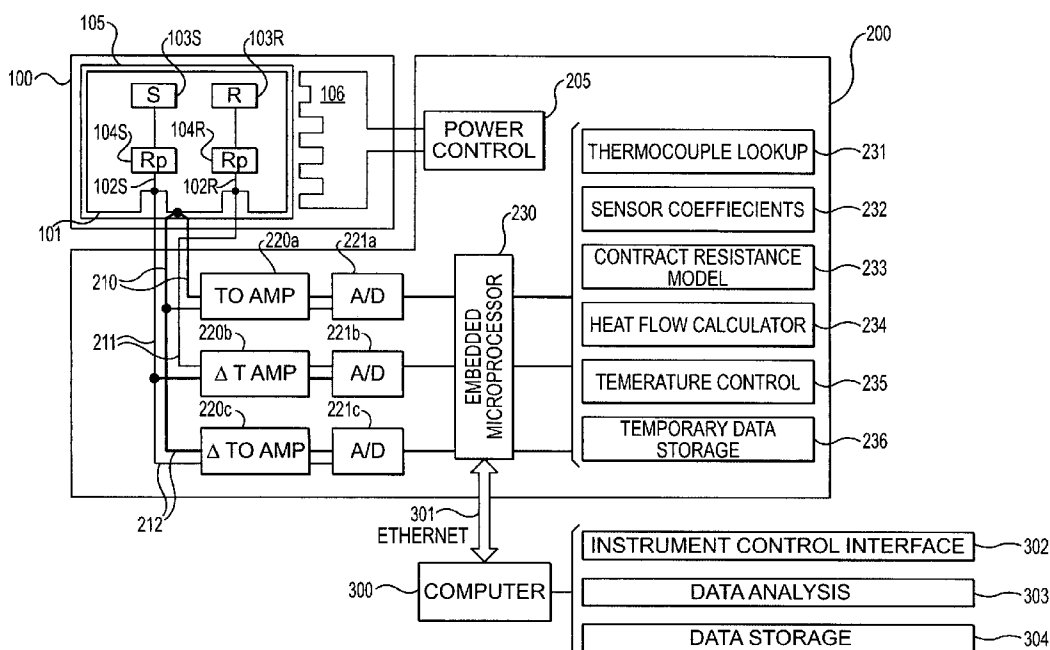
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[Continued on next page]

(54) Title: DIFFERENTIAL SCANNING CALORIMETER SENSOR AND METHOD



(57) Abstract: A sensor for a heat flux differential scanning calorimeter in which the differential temperatures are measured between locations external to the regions of heat exchange between the sensor and sample containers. The measured differential temperatures respond to the magnitude of the heat flow rate between the sensor and the sample and reference containers and are rendered insensitive to variations in the magnitude and distribution of thermal contact resistance between the sensor and the containers.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/18685

A. CLASSIFICATION OF SUBJECT MATTER IPC: G01K 17/00(2006.01);G01N 25/00(2006.01) USPC: 374/31,10 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) U.S. : 374/31, 10, 11, 12, 13, 14, 29, 30, 1, 43, 44; 422/51 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)																																
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category *</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 2003/0072348 A1 (DANLEY) 17 April 2003 (17.04.2003), figure 1b, paragraphs 50, 99, 101-103, 141, 145, 149, 153, 154, 169</td> <td>1-12</td> </tr> <tr> <td>---</td> <td></td> <td>-----</td> </tr> <tr> <td>Y</td> <td></td> <td>16, 17</td> </tr> <tr> <td>X</td> <td>US 2002/0021740 A1 (DANLEY) 21 February 2002 (21.02.2002), claim 4, paragraphs 23, 25, 26, 97, 99, 151, 176, 179</td> <td>13, 14</td> </tr> <tr> <td>X</td> <td>US 2003/0165179 A1 (DANLEY) 04 September 2003 (04.09.2003), figure 1.</td> <td>15, 18-20</td> </tr> <tr> <td>---</td> <td></td> <td>-----</td> </tr> <tr> <td>Y</td> <td></td> <td>16, 17</td> </tr> <tr> <td>A</td> <td>US 5,439,291 A (READING) 08 August 1995 (08.08.1995)</td> <td>1-20</td> </tr> <tr> <td>A</td> <td>US 5,224,775 A (READING et al) 06 July 1993 (06.07.1993)</td> <td>1-20</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 2003/0072348 A1 (DANLEY) 17 April 2003 (17.04.2003), figure 1b, paragraphs 50, 99, 101-103, 141, 145, 149, 153, 154, 169	1-12	---		-----	Y		16, 17	X	US 2002/0021740 A1 (DANLEY) 21 February 2002 (21.02.2002), claim 4, paragraphs 23, 25, 26, 97, 99, 151, 176, 179	13, 14	X	US 2003/0165179 A1 (DANLEY) 04 September 2003 (04.09.2003), figure 1.	15, 18-20	---		-----	Y		16, 17	A	US 5,439,291 A (READING) 08 August 1995 (08.08.1995)	1-20	A	US 5,224,775 A (READING et al) 06 July 1993 (06.07.1993)	1-20
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☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.																																
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Date of the actual completion of the international search 19 August 2008 (19.08.2008)		Date of mailing of the international search report 08 JAN 2009																														
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer Edward Lefkowitz <i>[Signature]</i> Telephone No. 571-272-2180																														

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/18685

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

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BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group 1, claim(s) 1-7 and 15-20, drawn to a calorimeter.

Group 2, claim(s) 8-14, drawn to a method of determining heat flow.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Group I claims a calorimeter for measuring a difference in temperature; and Group II claims a method for determining a heat flow rate. In this case, the special technical features stated above, i.e., measuring a temperature difference and determining a heat flow rate, are different for each of the Groups. Therefore, the inventions listed as Groups I and II do not relate to a single inventive concept since they lack the same or corresponding special technical features.

2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

Species 1, drawn to determining heat flow rate based on temperature.

Species 2, drawn to determining heat flow rate based on mass.

Species 3, drawn to determining noise-cancelled heat flow rate based on mass.

Species 4, drawn to determining low-noise heat flow rate based on mass.

The claims are deemed to correspond to the species listed above in the following manner:

Species 1, claims 8-11.

Species 2, claim 12.

Species 3, claim 13.

Species 4, claim 14.

The following claim(s) are generic: None.

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The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

Species 1 claims determining heat flow rate not based on mass; and each of Species 2-4 claim determining a heat flow rate based on mass. In this case, the special technical featured stated above, i.e., heat flow rate not based on a mass and heat flow rate based on a mass, are different between Species 1 and each of Species 2-4. Therefore, the inventions listed as Species 1 and each of Species 2-4 do not relate to a single inventive concept since they lack the same or corresponding special technical features.

Species 2 claims determining heat flow rate; and Species 3 claims determining a noise-cancelled heat flow rate. In this case, the special technical featured stated above, i.e., heat flow rate and a noise-cancelled heat flow rate, are different for each of the Species. Therefore, the inventions listed as Species 2 and 3 do not relate to a single inventive concept since they lack the same or corresponding special technical features.

Species 2 claims determining heat flow rate; and Species 4 claims determining a low-noise heat flow rate. In this case, the special technical featured stated above, i.e., heat flow rate and a low-noise heat flow rate, are different for each of the Species. Therefore, the inventions listed as Species 2 and 4 do not relate to a single inventive concept since they lack the same or corresponding special technical features.

Species 3 claims determining a noise-cancelled heat flow rate; and Species 4 claims determining a low-noise heat flow rate. In this case, the special technical featured stated above, i.e., noise-cancelled heat flow rate and low-noise heat flow rate, are different for each of the Species. Therefore, the inventions listed as Species 3 and 4 do not relate to a single inventive concept since they lack the same or corresponding special technical features.

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US07/18685**C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,095,153 A (WOO) 20 June 1978 (20.06.1978)	1-20
A	US 5,711,604 A (NAKAMURA) 27 January 1998 (27.01.1998)	1-20
A	US 5,788,373 A (HUETTER et al) 04 August 1998 (04.08.1998)	1-20
A	US 6,583,391 B2 (JORIMANN et al) 24 June 2003 (24.06.2003)	1-20
A	US 6,530,686 B1 (NAKAMURA) 11 March 2003 (11.03.2003)	1-20
A	US 7,371,006 B2 (SCHICK) 13 May 2008 (13.05.2008)	1-20