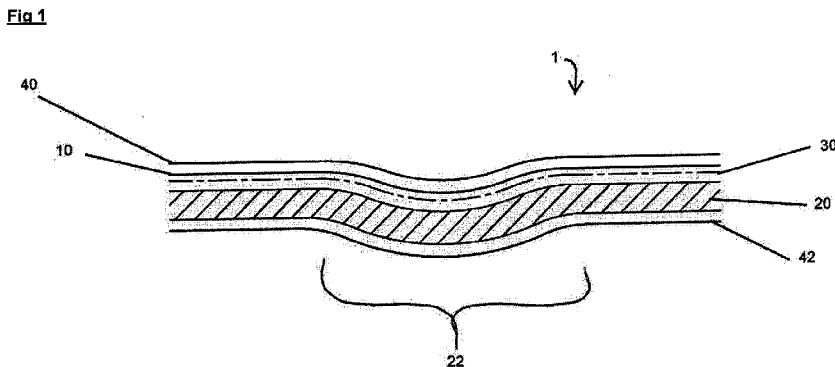




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  - (72) Inventors; and
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  - (74) Agents: **MENDOZA, Mia, E.** et al.; Fredrikson & Byron, P.A., 200 South Sixth Street, Suite 4000, Minneapolis, MN 55402-1425 (US).
  - (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
  - (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**  
— with international search report (Art. 21(3))
- (88) Date of publication of the international search report: 1 May 2014

(54) Title: HEATED UNDER-BODY WARMING SYSTEM



(57) Abstract: A heated underbody support comprising a heated mattress, heated mattress overlay or heated pad. The heated underbody support includes a heater assembly having an upper surface upon which a user directly or indirectly lays when the heated underbody support is in use. The heater assembly includes a flexible heating element including a sheet of conductive fabric having a substantially uniform Watt density. The heated underbody support also includes a layer of compressible material adapted to conform to the user's body when under pressure from the user resting upon the support. When the user lays upon the upper surface of the support, the heating element is adapted to adjust such that the temperature of the contact portion is less than the temperature of the non-contact portion of the support.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/29414

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - A47C 21/04 (2012.01) USPC - 219/212 According to International Patent Classification (IPC) or to both national classification and IPC																												
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) USPC 219/212 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC(8): A47C 21/04 (2012.01) USPC: 219/212, 217, 510, 527, 529, 538, 541, 547-549; 5/284, 421, 690; 607/96,108 (keyword limited; terms below) Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PubWEST (PGPB, USPT, EPAB, JPAB) and Google: Search Terms Used: heat, thermal, blanket, pad, mattress, watt, density, temperature, sensor, gauge, transducer, thermometer, controller, polymer, carbon, fiber, ink, thread, coating, conductive, compressible																												
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																												
<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>Y</td> <td>US 6,967,309 B2 (Wyatt et al) 22 November 2005 (22.11.2005), entire document, especially col 6, ln 11-15, 45-68; col 10, ln 62 to col 11, ln 21; col 11, ln 30-44; col 29, ln 31-37, ln 48-51; col 14, ln 41-45; col 18, ln 27 to col 19, ln 8; col 36, ln 11-14; Fig 1, 5, 23, 29A, 29B</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> <tr> <td>Y</td> <td>US 2010/0161016 A1 (Augustine et al) 24 June 2010 (24.06.2010), para [0005], [0018]-[0020], [0024]</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> <tr> <td>Y</td> <td>US 6,210,427 B1 (Augustine et al) 03 April 2001 (03.04.2001), col 3, ln 38-45; col 4, ln 6-20; col 7, ln 22-42; Fig 1, 11, 12</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> <tr> <td>Y</td> <td>US 2009/0095735 A1 (Resheff) 16 April 2009 (16.04.2009), para [0014], [0015], [0039], [0040], [0084]</td> <td>4, 5, 6/(4,5), 7/(4,5), 8/(4,5)</td> </tr> <tr> <td>A</td> <td>US 2010/0325796 A1 (Lachenbruch et al) 30 December 2010 (30.12.2010), entire document, especially para [0021]-[0035]; Fig 1-3</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> <tr> <td>A</td> <td>US 2007/0164010 A1 (Rock et al) 19 July 2007 (19.07.2007), entire document, especially para [0042]-[0057]; Fig 1-2</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> <tr> <td>A</td> <td>US 2010/0204763 A1 (Augustine et al) 12 August 2010 (12.08.2010), entire document, especially para [0028]-[0039]; Fig 1</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> <tr> <td>A</td> <td>US 7,851,729 B2 (Augustine et al) 14 December 2010 (14.12.2010), entire document, especially col 2, ln 55 to col 4, ln 42</td> <td>1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	US 6,967,309 B2 (Wyatt et al) 22 November 2005 (22.11.2005), entire document, especially col 6, ln 11-15, 45-68; col 10, ln 62 to col 11, ln 21; col 11, ln 30-44; col 29, ln 31-37, ln 48-51; col 14, ln 41-45; col 18, ln 27 to col 19, ln 8; col 36, ln 11-14; Fig 1, 5, 23, 29A, 29B	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	Y	US 2010/0161016 A1 (Augustine et al) 24 June 2010 (24.06.2010), para [0005], [0018]-[0020], [0024]	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	Y	US 6,210,427 B1 (Augustine et al) 03 April 2001 (03.04.2001), col 3, ln 38-45; col 4, ln 6-20; col 7, ln 22-42; Fig 1, 11, 12	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	Y	US 2009/0095735 A1 (Resheff) 16 April 2009 (16.04.2009), para [0014], [0015], [0039], [0040], [0084]	4, 5, 6/(4,5), 7/(4,5), 8/(4,5)	A	US 2010/0325796 A1 (Lachenbruch et al) 30 December 2010 (30.12.2010), entire document, especially para [0021]-[0035]; Fig 1-3	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	A	US 2007/0164010 A1 (Rock et al) 19 July 2007 (19.07.2007), entire document, especially para [0042]-[0057]; Fig 1-2	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	A	US 2010/0204763 A1 (Augustine et al) 12 August 2010 (12.08.2010), entire document, especially para [0028]-[0039]; Fig 1	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	A	US 7,851,729 B2 (Augustine et al) 14 December 2010 (14.12.2010), entire document, especially col 2, ln 55 to col 4, ln 42	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40	<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																										
Y	US 6,967,309 B2 (Wyatt et al) 22 November 2005 (22.11.2005), entire document, especially col 6, ln 11-15, 45-68; col 10, ln 62 to col 11, ln 21; col 11, ln 30-44; col 29, ln 31-37, ln 48-51; col 14, ln 41-45; col 18, ln 27 to col 19, ln 8; col 36, ln 11-14; Fig 1, 5, 23, 29A, 29B	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40																										
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* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family																											
Date of the actual completion of the international search 05 June 2012 (05.06.2012)	Date of mailing of the international search report <b>22 JUN 2012</b>																											
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: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774																											

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/29414

## 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 6,452,138 B1 (Kochman et al) 17 September 2002 (17.09.2002), entire document, especially col 3, ln 30 to col 5, ln 12	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40
A	US 2008/0173629 A1 (Deibel et al) 24 July 2008 (24.07.2008), entire document, especially para [0028]-[0048]; Fig 2	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40
A	US 2010/0119704 A1 (Hemmelgarn et al) 13 May 2010 (13.05.2010), entire document, especially para [0077] to [0095]	1-5, 6/(4,5), 7/(4,5), 8/(4,5), 20-22 and 34-40

# INTERNATIONAL SEARCH REPORT

International application No.

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## 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.: 9-19 and 23-33  
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:

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 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.