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- (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, BN, 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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.
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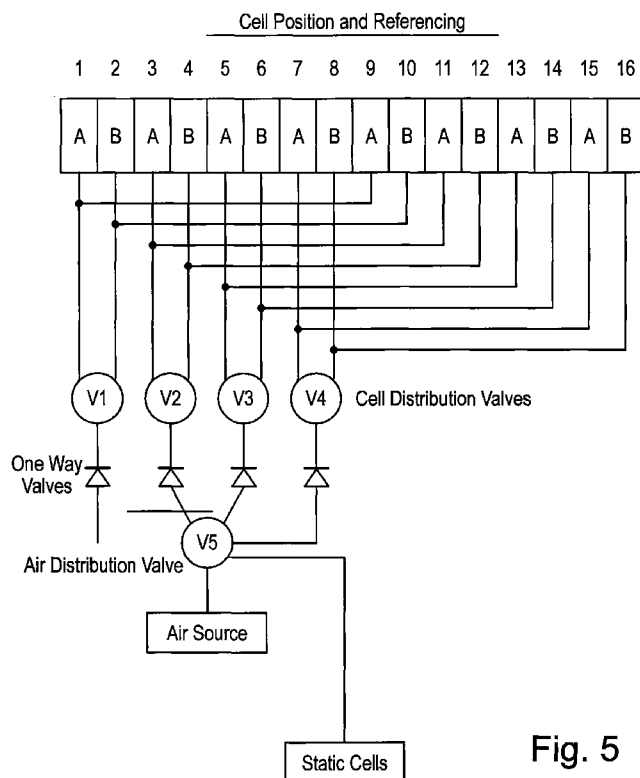
(54) **Title:** IMPROVEMENTS IN AND RELATING TO CELL INFLATION OF A MATTRESS

Fig. 5

(57) **Abstract:** Inflatable mattress apparatus includes a mattress provided with a plurality of inflatable cells (A, B); a manifold unit (V1-V4) connected to the plurality of cells, wherein the manifold (V1-V4) couples the cells into a plurality of individual sets of cells; and a control unit connected to the manifold, the control unit being operable to provide substantially simultaneous inflation and deflation of cells (A, B) in each set of cells over a period, and time offset inflation and deflation of cells in different sets of cells. The apparatus can provide the same benefits of a 1 of 2' system with reduced movement of the entire surface at any point in the cycle, less air moving at any given time and thus a reduction in the audible noise produced in any pump supplying the air and the associated airflow in the mattress. The arrangement provide other benefits too.



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

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29 October 2015

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2015/050072

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61G7/057
ADD.

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)
A61G

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)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/201858 A1 (CAMINADE JEAN-LUC [FR]) 28 August 2008 (2008-08-28) paragraphs [0151] - [0153], [0177]; claim 12; figures 3A,3B,4 -----	1-34
X	US 2007/186349 A1 (LIPMAN SHAWN [US] ET AL) 16 August 2007 (2007-08-16) paragraphs [0046], [0047], [0050], [0051]; figures 5A-5D,9A-9C,12 -----	1-19, 21-34
X	WO 2006/023479 A2 (KRAMER KENNETH L [US]; DAHNEKE MARSHALL S [US]; BIONDO JOHN P [US]; WI) 2 March 2006 (2006-03-02) page 3, line 30 - page 5, line 2; figures 13,20,22 page 25, lines 16-24 page 30, lines 20-28 ----- -/--	1-34



Further documents are listed in the continuation of Box C.



See patent family annex.

* 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

21 April 2015

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04/09/2015

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2015/050072

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 267 364 A (VOLK CRAIG K [US]) 7 December 1993 (1993-12-07) column 2, lines 7-50 column 4, line 43 - column 5, line 34; figures 2A-2G,5A,5B,6 -----	1-34
X	US 5 685 036 A (KOPFSTEIN ALLEN [US] ET AL) 11 November 1997 (1997-11-11) column 2, line 63 - column 4, line 7; figures 1-5 -----	1-16, 21-33
X	WO 02/45641 A1 (HUNTLEIGH TECHNOLOGY PLC [GB]; KEMP DANIEL [GB]) 13 June 2002 (2002-06-13) page 6, lines 10-24; figures 1-3 -----	1-7,9, 10, 13-16, 21-27, 31-33

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2015/050072

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:

see additional 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 an 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.:

1-34

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-34

Inflatable mattress apparatus comprising a plurality of sets of cells connected to a manifold and a control unit operable to provide offset inflation and deflation of different sets of cells.

Special technical feature (STF): None.

Technical effect (TE): None.

Technical problem (TP): None.

2. claims: 35-40

Inflatable medical mattress including a plurality of cells, which at the sacral zone are parallel to the longitudinal extent of the mattress and in at least one other zone parallel to the transverse extent of the mattress.

STF (found in claim 35): The cells at the sacral zone are parallel to the longitudinal extent of the mattress and in at least one other zone parallel to the transverse extent of the mattress.

TE: The cells at the sacral zone extend to a different direction than the cells in at least one of the other zones.

TP: How to provide improved therapeutic operation within the sacral zone.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2015/050072

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008201858 A1	28-08-2008	AU 2008200769 A1 EP 1964494 A1 FR 2912884 A1 JP 5179220 B2 JP 2008237892 A US 2008201858 A1 US 2015074914 A1	11-09-2008 03-09-2008 29-08-2008 10-04-2013 09-10-2008 28-08-2008 19-03-2015
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