

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 February 2008 (28.02.2008)

PCT

(10) International Publication Number
WO 2008/024561 A3

(51) International Patent Classification:

A61B 5/00 (2006.01) A61B 5/04 (2006.01)
A61B 5/02 (2006.01) A61B 5/08 (2006.01)

(21) International Application Number:

PCT/US2007/072854

(22) International Filing Date: 5 July 2007 (05.07.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/818,699 5 July 2006 (05.07.2006) US
11/773,714 5 July 2007 (05.07.2007) US

(71) Applicant (for all designated States except US):
STRYKER CORPORATION [US/US]; 2825 Airview
Boulevard, Kalamazoo, Michigan 49002 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WAN FONG,**
David Kim Soui [MU/CA]; 1875 Blvd Rive Sud Apt.
103, St-Romuald, Québec G6W 8K6 (CA). **DIONNE,**
Jean-Paul [CA/CA]; 17 L'Esperance, Levis, Québec G6V
7A6 (CA).

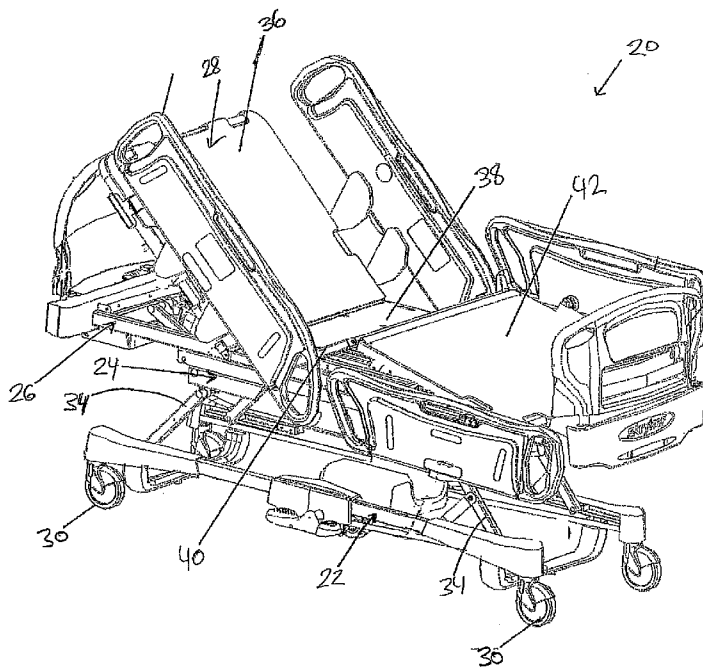
(74) Agent: **VAN DYKE, GARDNER, LINN &
BURKHART, LLP**; 2851 Charlevoix Dr. Suite 207,
P.O. Box 888695, Grand Rapids, Michigan 49588-8695
(US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH,
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, PG, PH, PL,
PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY,
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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,
PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: A SYSTEM FOR DETECTING AND MONITORING VITAL SIGNS



(57) Abstract: A system and method for determining and monitoring various characteristics of a patient positioned on a patient support apparatus, such as a bed, stretcher, or cot, is disclosed. The system and method involve monitoring the forces exerted by the patient on one or more force sensors, which may be load cells on the support apparatus. These force sensors will detect vibrations that correspond to various conditions of the patient, including the patient's heart rate, breathing rate, and/or the seizure status of a patient. These vibrations may be analyzed, such as by Fast Fourier Transforms, in order to determine the various conditions of the patient.

WO 2008/024561 A3



Declarations under Rule 4.17:

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
- *of inventorship (Rule 4.17(iv))*

(88) Date of publication of the international search report:

23 October 2008

Published:

- *with international search report*

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/72854

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61B 5/00(2006.01),5/02(2006.01),5/04(2006.01),5/08(2006.01)

USPC: 600/300,301,481,502,529,534

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. : 600/300,301,481,502,529,534

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

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y A	US 5,620,003 A (SEPPONEN) 15 April 1997 (15.04.1997), figs. 2, 4, 5a & b, col. 2, line 26-col. 4, line 54.	1-5,8,12,23- 25,27,29,30-32 ----- 18 6,7,9,10,19-22,33-37
Y --- A	US 6,280,392 B1 (YOSHIMI et al.) 28 August 2001 (28.08.2001), figs. 1-3; col. 2, line 32-col. 3, line 15; col. 8, lines 5-15	11,15-17 ----- 6,7,9,10,19-22,28,33-37
X --- Y	US 6,450,957 B1 (YOSHIMI et al.) 17 September 2002 (17.09.2002), figs. 1-3; col. 2, line 21-col. 4, line 27	1-5,8,12- 1423,24,26,29-32 ----- 11,15-18



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 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

24 May 2008 (24.05.2008)

Date of mailing of the international search report

07 JUL 2008

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner of Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

PATRICIA C. MALLARI

Telephone No. (571) 272-3000

Ann Heather
Jey

INTERNATIONAL SEARCH REPORT

PCT/US07/72854

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A		6,7,9,10,19-22,28,33-37
Y	US 4,595,016 A (FERTIG et al.) 17 June 1986 (17.06.1986), col. 3, line 29-col. 4, line 2.	16