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[Continued on next page]

(54) Title: MOBILITY AID

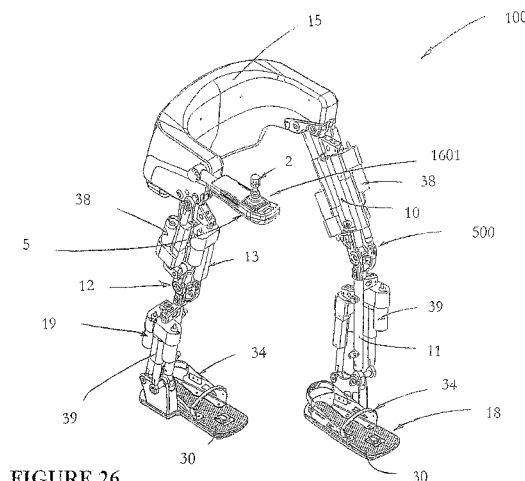


FIGURE 26

(57) Abstract: According to a first aspect there is provided a walking aid (WA) (100) usable as a medical device, suitable for supporting a mobility impaired disabled user while moving through a set of movements correlating to a walking motion. The WA (100) comprises an exoskeleton (500), a power source in the form of a battery pack or other similar onboard power pack (not shown) together with its associated power supply cables (not shown), and a control system (not shown). The exoskeleton (500) comprises a rigid pelvic support member or hip frame (15) including a pelvic harness (96), and a pair of leg structures (50) (a first leg structure and second leg structure). Each of the leg structures (50) comprise an upper leg structural member (10), a lower leg structural member (11), a foot member (18), a main hip actuator (16), a knee actuator (13) and a main foot actuator (19). The upper leg structural member (10) is for securing with an upper leg (610) of a user (600), the upper leg structural member (10) being pivotally engaged at a first end (10a) thereof to the hip frame (15) by the hip joint (14). The lower leg structural member (11) is for securing with the lower leg (620) of the user (600), the lower leg structural member (11) being pivotally engaged at a first end (11a) thereof to a second end (10b) of the upper leg structural member (10) by a knee joint (12). At a first end (10) of the upper leg member (10) is a hip joint (14) that pivotally engages the upper leg member (10) with the hip frame (15). The hip joint (14) defines a hip axis (14A) that in use is located relative to the user (600) at or approximate to the

[Continued on next page]



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natural axis of hip rotation in an anterior/posterior direction of movement. In a preferred embodiment, each hip joint (14) is configured relative to the hip frame (15) with its axis of rotation (14A) extending downwardly in a lateral direction at an angle of between zero and ten degrees, and more preferably of about four degrees. This inclination of the axis of rotation (14A) mimics a human beings upper leg alignment. The inclination allows for more natural transfer of the centre of mass (generally located about the middle of the pelvis) to a point within the support area provided by the foot member (18) during when the WA (100) is controlled in a natural walking movement.

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. *A61H 3/00; A61F 5/00* (2006.01)

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)

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)

EPOQUE:- A61F/ic, A61H/ic, A63B/ic, A61B/ic, B25J/ic and keywords (exoskeleton, suit, orthosis, brace, stand+, walk+, gait, assist+, aid, rehabilitate, powered, robot+, automat+, elect+)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0123997 A1 (HERR et al.) 31 May 2007 See figures 24 and 26; paragraphs [0118], [0120], [0122], [0123], [0127], [0129], [0140], [0142]-[0143], [0154], [0159], [0186], [0197]-[0203], [0236], [0239]-[0241].	1-21, 28-58, 62-99, 105-145, 147, 149-154
Y		22-27, 59-61, 100-104, 146, 148
X	US 5282460 A (BOLDT) 1 February 1994 See figures 1 and 2; column 3, lines 49-51; column 5, lines 45-55; column 14, lines 8-16; column 16, lines 43-64; column 17, lines 33-46.	1-18, 20-21, 28-58, 62-95, 97-99, 105-145, 149-154
Y		19, 22-27, 59-61, 96, 100-104, 146-148
X	GB 2301776 A (COKER) 18 December 1996 See figures 1-3; page 4, paragraph 3 to page 5, paragraph 1.	1-18, 20-21, 28-58, 61-95, 97-99, 105-145, 149-154
Y		19, 22-27, 59-61, 96, 100-104, 146-148
X	US 7190141 B1 (ASHRAFIUON et al.) 13 March 2007 See figure 1; column 3, line 6-column 4, line 2; column 4, lines 46-49; column 8, lines 49-58.	1-18, 20-21, 28-58, 62-95, 97-99, 105-145, 149-154
Y		19, 22-27, 59-61, 96, 100-104, 146-148

☒ 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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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19 JUN 2009Name and mailing address of the ISA/AU
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INTERNATIONAL SEARCH REPORT

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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 7153242 B2 (GOFFER) 26 December 2006 See figures 1b, 2b, and 3b.	1-11, 18-46, 52-54, 59, 62, 64-75, 77-88, 95- 123, 129-141, 146, 149, 151-153
X	US 5476441 A (DURFEE et al.) 19 December 1995 See figures 1 and 2.	1-11, 18-46, 52-54, 62, 64-75, 77-88, 95-123, 129-141, 149, 151-153
X	US 5961541 A (FERRATI) 5 October 1999 See figures 1-3.	1, 7-11, 18-22, 28-36, 62-75, 77-78, 84-88, 95, 105-113, 129-138, 149- 153
X	US 2006/0064047 A1 (SHIMADA et al.) 23 March 2006 See figures 1-4.	1, 7-11, 18-22, 28-46, 66-75, 77-78, 84-88, 95, 105-123, 129-138, 153
Y	WO 2007/088044 A1 (CANTONI) 9 August 2007 See figures 1-5.	19, 22-27, 96, 100-104
Y	US 2006/0200272 A1 (KAWAI) 7 September 2006 See abstract and paragraph 0014.	59-61, 146-148
	With regard to the Y category citations, it is intended to combine the disclosure of orthotic devices incorporated into the walking device of WO Patent 2007/088044, and the disclosure of position sensors of US 2006/0200272, with the exoskeletons of US 2007/0123997, US 5282460, GB 2301776 and US 7190141.	

Information on patent family members

PCT/NZ2008/000351

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member	
US 2007123997	US 7313463	US 2006249315	US 2007016329
	US 2007043449	US 2007162152	
US 5282460	NONE		
GB 2301776	NONE		
US 7190141	NONE		
US 7153242	EP 1260201	US 2003093021	
US 5476441	NONE		
US 5961541	EP 0782843	EP 0911015	IT MI960001
US 2006064047	JP 2006087477	JP 2006087478	JP 2006115971
	US 7429253		
WO 2007088044	AR 059277	EP 1983960	IT MI20060187
US 2006200272	EP 1627711	JP 2004314250	WO 2004091866
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.			
END OF ANNEX			