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- (71) Applicant: XSENS HOLDING B.V. [NL/NL]; Pantheon
6A + 8A, NL-7521 PR Enschede (NL).
- (72) Inventors: BELLUSCI, Giovanni; Deldenerstraat 6 88,
NL-7551 AE Hengelo (NL). LUNGE, Hendrick, J.; De
Regenboog 2, NL-7513 KC Enschede (NL). HOL, Jeroen,
D.; Anna Bijnstraat 16, NL-7552 NC Hengelo (NL).
- (74) Agent: JANSEN, C.M.; V.O., Carnegieplein 5, 2517 KJ
Den Haag (NL).

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[Continued on next page]

(54) Title: MOTION TRACKING WITH REDUCED ON-BODY SENSORS SET

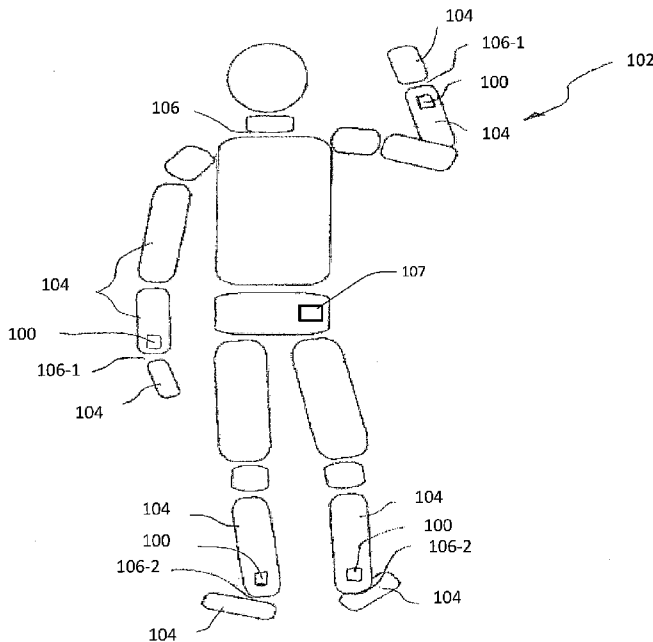


FIG. 1

(57) Abstract: A method of tracking the motion of a moving object having a plurality of linked segments is provided. The method uses a limited set of sensing units that are coupled to one or more of the segments to receive one or more sensor signals from the sensing units. Based on the sensor signals, the method estimates a 3D orientation and predicts a 3D position of the segments at a tracking module. The method further communicates the 3D orientation and the 3D position of the segments to a database module, and associates a pose of the object to the 3D orientation and the 3D position of the segments.

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 2012/046901 A1 (GREEN JONATHAN ANTHONY [GB] ET AL) 23 February 2012 (2012-02-23) paragraph [0001] - paragraph [0012]; figure 1 -----	1-31		
X	VLASIC D ET AL: "Practical motion capture in everyday surroundings", ACM TRANSACTIONS ON GRAPHICS (TOG), ACM, US, vol. 26, no. 3, 29 July 2007 (2007-07-29), pages 35/1-35/10, XP007910935, ISSN: 0730-0301, DOI: 10.1145/1276377.1276421 the whole document -----	1-31		
X	US 2009/278791 A1 (SLYCKE PER JOHAN [NL] ET AL) 12 November 2009 (2009-11-12) paragraph [0022] - paragraph [0040] ----- -/--	1-31		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
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"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			
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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	EP 2 141 632 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 6 January 2010 (2010-01-06) paragraph [0010] - paragraph [0052] -----	1-31
X	EP 1 970 005 A1 (XSENS TECHNOLOGIES B V [NL]) 17 September 2008 (2008-09-17) cited in the application the whole document -----	1-31

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/IB2015/000700

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2012046901	A1	23-02-2012	EP 2389111 A2 30-11-2011 US 2012046901 A1 23-02-2012 WO 2010084348 A2 29-07-2010

US 2009278791	A1	12-11-2009	AT 473681 T 15-07-2010 EP 1959831 A1 27-08-2008 NL 1030440 C2 21-05-2007 US 2009278791 A1 12-11-2009 WO 2007058526 A1 24-05-2007

EP 2141632	A2	06-01-2010	EP 2141632 A2 06-01-2010 JP 5657216 B2 21-01-2015 JP 2010014712 A 21-01-2010 KR 20100002803 A 07-01-2010 US 2009322763 A1 31-12-2009

EP 1970005	A1	17-09-2008	EP 1970005 A1 17-09-2008 JP 5388473 B2 15-01-2014 JP 2008289866 A 04-12-2008 US 2008262772 A1 23-10-2008 US 2008285805 A1 20-11-2008
