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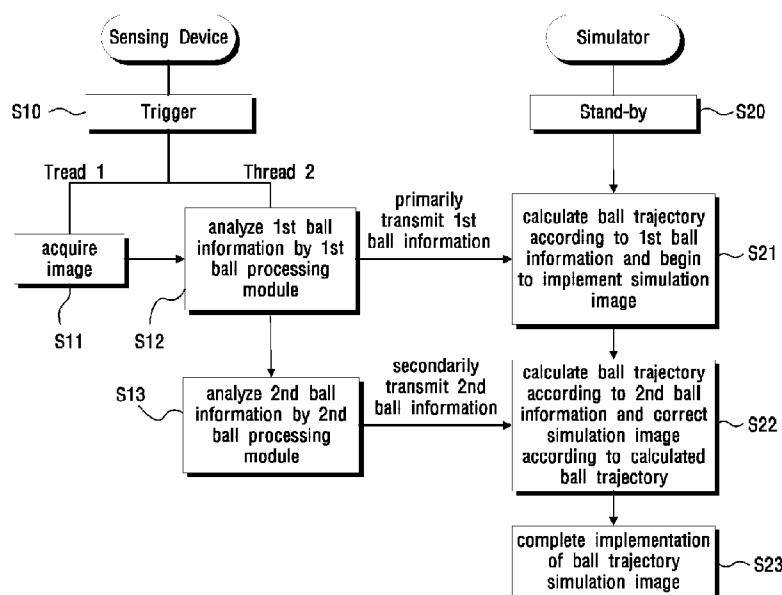
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(54) Title: VIRTUAL GOLF SIMULATION APPARATUS AND METHOD

[Fig. 3]



(57) Abstract: A virtual golf simulation apparatus and method are provided. A sensing device senses hitting a ball by a user with a golf club and a ball trajectory is simulated in a virtual golf course according to sensing results, allowing the user to enjoy a virtual golf on a virtual golf course to provide the same sense of realism as when playing golf on a real golf course. While sensing processes requires a long time as the sensing device accurately senses physical characteristics of a moving ball, it is possible to achieve rapid implementation of a ball trajectory simulation image according to sensing results. This reduces the difference between the time at which a ball is struck by the user and the time at which a ball trajectory starts to be implemented in the simulation image to a level that cannot be perceived by humans, thereby improving the realism of virtual golf.



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A. CLASSIFICATION OF SUBJECT MATTER***A63B 69/36(2006.01)i***

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)

A63B 69/36; G06F 15/44; G01B 11/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: golf, virtual apparatus, swing, camera, sensor, image

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-0937922 B1 (ENGIVICE CO., LTD.) 21 January 2010 See the abstract, claims 1, 2, 8, and figures 1-4.	1-18
A	KR 10-0871595 B1 (PARK, SEON EUI) 02 December 2008 See the abstract, claim 1, and figures 7-11.	1-18
A	KR 10-2008-0106904 A (RANGETAINMENT TECHNOLOGIES GMBH) 09 December 2008 See the abstract, claims 1, 15, and figures 1-4.	1-18
A	US 2007-0196800 A1 (DOUTHIT, RONNIE D. et al.) 23 August 2007 See the abstract, claims 1, 9, 20, 30, and figures 1-3.	1-18
A	US 5342054 A (CHANG, PHILIP L. et al.) 30 August 1994 See the abstract, claims 1, 16, and figures 1, 2, 8-8.	1-18



Further documents are listed in the continuation of Box C.



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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-0937922 B1	21.01.2010	KR 10-1044729 B1 KR 10-2010-0092356 A KR 10-2010-0092357 A US 2011-0292203 A1 WO 2010-093141 A2 WO 2010-093141 A3	28.06.2011 20.08.2010 20.08.2010 01.12.2011 19.08.2010 19.08.2010
KR 10-0871595 B1	02.12.2008	None	
KR 10-2008-0106904 A	09.12.2008	CA 2636820 A1 CN 101410153 A EP 1810721 A1 EP 1810722 A1 EP 1810723 A1 EP 1810724 A1 EP 1810725 A1 EP 1973615 A1 JP 2009-524089 A US 2010-0151957 A1 WO 2007-082765 A1 WO 2008-052605 A1	26.07.2007 15.04.2009 25.07.2007 25.07.2007 25.07.2007 25.07.2007 25.07.2007 01.10.2008 25.06.2009 17.06.2010 26.07.2007 08.05.2008
US 2007-0196800 A1	23.08.2007	None	
US 5342054 A	30.08.1994	WO 94-21335 A1	29.09.1994