

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 January 2006 (05.01.2006)

PCT

(10) International Publication Number
WO 2006/002293 A3

(51) International Patent Classification:
A63B 69/36 (2006.01)

(21) International Application Number:
PCT/US2005/022184

(22) International Filing Date: 22 June 2005 (22.06.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/581,991 22 June 2004 (22.06.2004) US
60/582,031 22 June 2004 (22.06.2004) US
60/581,960 22 June 2004 (22.06.2004) US

(71) Applicant (for all designated States except US): ACCU-SPORT INTERNATIONAL, INC. [US/US]; 4310 Enterprise Drive, Suite C, Winston-Salem, NC 27106 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): RANKIN, David, Benjamin [US/US]; 4440 Greenbriar Farm Road, Winston-Salem, NC 27106 (US). WINFIELD, Douglas [US/US]; 108 Perkins Place, Seneca, SC 29678 (US).

(74) Agents: SPENCE, Andrew, T. et al.; Alston & Bird LLP, Bank of America Plaza, Suite 4000, 101 South Tryon Street, Charlotte, NC 28280-4000 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, 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, MC, 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).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
27 April 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS, METHOD AND COMPUTER PROGRAM PRODUCT FOR ANALYSING FLIGHT OF AN OBJECT

(57) Abstract: A method, apparatus and computer program product are provided that determine a measure of launch efficiency of a ball that is more readily understandable by golfers as being indicative of the quality of a shot. A system, method and computer program product are also provided in which the initial sidespin of a ball is measured such that the resulting flight path of the ball may be simulated more accurately. An apparatus, method and computer program product are further provided to analyze human performance, such as a golf shot, as defined by an initial data set that is comprised of a plurality of data elements.



WO 2006/002293 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2005/022184

A. CLASSIFICATION OF SUBJECT MATTER
A63B69/36

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

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 practical, 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.
A	WO 00/44450 A (ORTHOPEDIC SYSTEMS INC; STIVERS, KEITH; EPSTEIN, ALLAN; LAMB, STEVE, R) 3 August 2000 (2000-08-03) page 1 page 4, paragraph 3 page 8, paragraph 3 page 15, paragraph 2 page 18, paragraph 4 page 20, paragraph 1 page 22, paragraph 1 page 25, paragraph 3	1,7,13, 16,19
A	----- US 4 375 887 A (LYNCH ET AL) 8 March 1983 (1983-03-08) column 2, paragraph 2 column 5; figures 1,3 -----	1,7,13, 16,19

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 document 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

15 November 2005

Date of mailing of the international search report

21. 03. 2006

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lundblad, H

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2005/022184

Box 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 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 fee, this Authority did not invite payment of any additional fee.

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.:

1-21

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- 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: 1-21

STF: An apparatus capable of determining launch efficiency based upon measured launch conditions and any combination of launch angle and spin rate.

Objective problem: How to determine a more reliable launch efficiency of a golf stroke.

2. claims: 22-41

STF: An apparatus capable removing outlier data, determining a deviation, filtering the initial data and analyzing the human performance.

Objective problem: How to avoid that a non-representative golf stroke destroys the accuracy of the analysis.

3. claims: 42-57

STF: An apparatus comprising a sensor for measuring at least the side spin of a golf ball and a computing device being capable of determining a simulated flight path based on at least the side spin and creating a representation of the resulting flight path.

Objective problem: How to simulate the flight path of a golf ball.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2005/022184

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0044450	A	03-08-2000	AU 2862400 A	18-08-2000
			JP 2002535102 T	22-10-2002

US 4375887	A	08-03-1983	NONE	
