

(12) **United States Patent**
Fitchett et al.

(10) **Patent No.:** **US 9,409,064 B2**
(45) **Date of Patent:** ***Aug. 9, 2016**

(54) **GOLF BALL HAVING AN AERODYNAMIC COATING INCLUDING MICRO SURFACE ROUGHNESS**

(75) Inventors: **Derek A. Fitchett**, Beaverton, OR (US);
Johannes Anderl, Vienna (AT)

(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 321 days.
This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/184,254**

(22) Filed: **Jul. 15, 2011**

(65) **Prior Publication Data**
US 2012/0184397 A1 Jul. 19, 2012

Related U.S. Application Data

(63) Continuation-in-part of application No. 12/569,955, filed on Sep. 30, 2009.

(51) **Int. Cl.**
A63B 37/06 (2006.01)
A63B 37/12 (2006.01)
A63B 37/00 (2006.01)
A63B 45/00 (2006.01)

(52) **U.S. Cl.**
CPC **A63B 37/12** (2013.01); **A63B 37/0022** (2013.01); **A63B 45/00** (2013.01)
USPC **473/378**

(58) **Field of Classification Search**
CPC **A63B 37/0005**; **A63B 37/0022**
USPC **473/378**
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,819,190 A	6/1974	Nepela et al.
4,266,733 A	5/1981	Butler
4,266,773 A	5/1981	Treadwell
4,284,276 A	8/1981	Worst
4,438,924 A	3/1984	Carr

(Continued)

FOREIGN PATENT DOCUMENTS

CN	1953790 A	4/2007
EP	2314359 A1	4/2011

(Continued)

OTHER PUBLICATIONS

Elmar Achenbach (1974), "The Effects of Surface Roughness and Tunnel Blockage on the Flow Past Spheres," J. Fluid Mechanics, vol. 65, part 1, pp. 113-125.
Sajima, T., Yamaguchi, T., Yabu, M., and Tsunoda, M. (2006), The Aerodynamic Influence of Dimple Design on Flying Golf Ball, in Springer (ed.), Engineering of Sport 6, p. 143.
Jin Choi, Woo-Pyung Jeon, and Haecheon Choi (2006), "Mechanism of Drag Reduction by Dimples on a Sphere," by Physics of Fluids 18, pp. 1-4.

(Continued)

Primary Examiner — Raeann Gorden
(74) *Attorney, Agent, or Firm* — Banner & Witcoff, Ltd.

(57) **ABSTRACT**

Golf balls include: (a) a golf ball body having a first set of construction specifications and a first dimple pattern formed on an outer surface of the golf ball body; and (b) a coating applied to the outer surface of the golf ball body to thereby produce a coated golf ball body having an exterior surface. At least one of the outer surface of the golf ball body and the coating includes a plurality of surface roughening particles to provide increased micro surface roughness as compared to golf balls having the same set of construction specifications and the same dimple pattern but without the micro surface roughening particles. The micro surface roughening affects the aerodynamic properties of the ball.

25 Claims, 11 Drawing Sheets

