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(54) Uniformly weighted golf ball

(57) A golf ball in which the density of the core (10) and the density of the cover (11) materials are essentially identical.

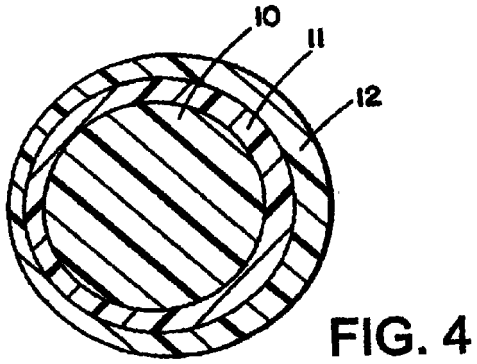

FIG. 4

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Description

Background of the Invention

[0001] At the present time, golf balls are manufactured using various materials for cores, inner cores, outer covers and covers. These materials are each of a different density and thus, if they are not perfectly centered about one another, there can be a heavy side and a light side to the ball. If a straight line is drawn between the light and heavy points in a golf ball, and this line is parallel to the desired direction of travel, then when striking the ball towards the target, the ball's travel will be true and straight to the target. If this imaginary line is perpendicular to the target and the ball is struck towards that target, then the ball's travel will veer slightly in the direction of the heavy side of the ball.

[0002] Golf balls currently are usually made of a core comprised of polybutadiene and a zinc monomer material with a total typical density of 1.18 grams per cubic centimeter. The golf ball core thus formed is centerless ground to achieve near perfect roundness. The next is the most difficult step and that is to center this core in the final mold and keep it centered while the cover material is injection molded around the core. This is usually done by using retractable steel pins in the mold. The extremely high injection pressure and viscosity of the cover material creates very high pressures on the core and even with steel pins, movement is almost impossible to avoid. Thus, it is not unusual to see differences of cover thickness of 0.005 inches to 0.020 inches from one side of the ball to another. In fact a standard inspection method in golf ball production is to x-ray or cross section balls to note differences in cover thickness. This produces a heavy side and a light side to the ball with the attendant disadvantages mentioned above.

[0003] Low-cost, one-piece balls have long been manufactured for driving ranges and these are thought to be weight balanced. However, compromises are made to the material of construction and thus the balls distance performance and "feel" is generally recognized as inferior. Because of the poor performance, these balls are not generally sold to the general public. Around the turn of the century, one piece balls were also manufactured but again their performance did not compete with multi-material constructed balls introduced later.

Brief Summary of the Invention

[0004] This invention involves: (1) making one or more covering layers of the golf ball of the same density as the "standard" core material (1.18gm/cc) — resulting in a ball that is heavier than the standard, but weight balanced; (2) making the cover heavier and the core lighter (for example, both 1.13gm/cc) — resulting in a ball of the desired weight and properly weight balanced; and (3) making the core lighter, matching the density of a typical cover material (0.99gm/cc) resulting in a ball that is lighter than the standard, but properly weight balanced. Thus, if there are variations of thickness of the layer or layers of materials surrounding the core because of the difficulties of injection molding, such thickness differences will have no effect on the balance of the golf ball.

[0005] It is therefore an object of this invention to provide a multi-layer golf ball which will have improved characteristics and it is a further object of this invention to provide a multi-layer golf ball which has uniform density throughout.

[0006] This, together with other objects of the invention, will become apparent from the following detailed description of the invention and the accompanying drawings.

Brief Description of the Drawings

[0007]

Figure 1. A perspective view of conventional golf ball.

Figure 2. A cross section of a conventional golf ball in which the core 10 and the outer layer 11 are perfectly centered.

Figure 3. A cross section of a typical golf ball in which the core 10 has an outer layer 11 which is thicker on the right side of the core than the left side.

Figure 4. A cross section of a typical multi-layer golf ball in which the core 10 has outer layers 11 and 12 which are thicker on the right side than on the left side.

Detailed Description of the Invention

[0008] Figure 1 is a perspective view of a conventional golf ball. Figure 2 is a cross section of a conventional golf ball in which the core 10 and the outer layer 11 are perfectly centered. Figure 3 is a cross section of a typical golf ball in which the core 10 has an outer layer 11 which is thicker on the right side of the core than the left side. Figure 4 is a multi-layer golf ball wherein the layers 11 and 12 are thicker on the right side than on the left side.

[0009] Applicant's invention preferably involves making the density of the core material and the density of the cover materials the same. For example, utilizing a core having a density of 1.13 gm/cc, the initial layer and each succeeding layer can be constructed of suitable materials that have been formulated with constituents that bring the density of the layer to exactly match the 1.13 gm/cc of the core. In this manner, assuming the finished ball is perfectly spherical, it is not critical that the cover and core be concentric since the ball will always be perfectly balanced.

[0010] Currently, golf balls with off center weight as a result of the difficulties of manufacturing are the norm. Applicant recently tested over 12 dozen balls from leading domestic manufacturers. There was not one ball that was perfectly centered. A putting robot was used and as many as 49 out of 50 twelve foot robotic putts missed the hole due to rolling off line caused by lack of weight centering. Based on the putting tests that had been concluded, it is projected that a 250 yard drive would be effected by as much as 36 feet deviation from the intended target.

[0011] In contrast utilizing golf balls based on Applicant's invention and using a robotic putter at the same 12 foot distance, 43 out of 50 putts were sunk in the hole. Furthermore, it is reasonable to expect that similar results are to be realized using drivers and irons hitting balls a much greater distance.

[0012] In addition, in manufacturing a golf ball according to Applicant's invention, it is not necessary to utilize the centerless grinding operation and this results in lower cost.

[0013] While this invention has been shown and described with respect to a detailed embodiment thereof, it will be understood by those skilled in the art that various changes in form and detail thereof may be made without departing from the scope of the claims of the invention.

Claims

1. A golf ball comprising

a spherical core,
one or more layers of material completely covering said core
wherein the density of the core and the density of said one or more layers surrounding said core are essentially identical

2. The golf ball of Clam 1 wherein said core has been prepared by centerless grinding.

3. The golf ball of Claim 1 wherein said core is a blend of polybutadiene and a zinc monomer.

4. The golf ball of Claim 1 wherein said core is completely covered by at least one layer of a suitable material which contains density altering constituents so that its density is essentially identical to the density of said core.

5. The golf ball of Claim 1 wherein said core is covered by one or more layers of a material selected from the group consisting of urethane, balata, and an ionomer resin or any combination of these materials, which have been modified with density altering constituents such that the density of the core, said one or more layers, and the complete ball will be essentially the same.

FIG. 1

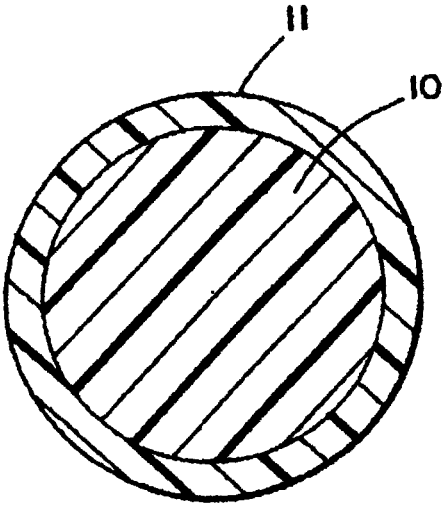

FIG. 2

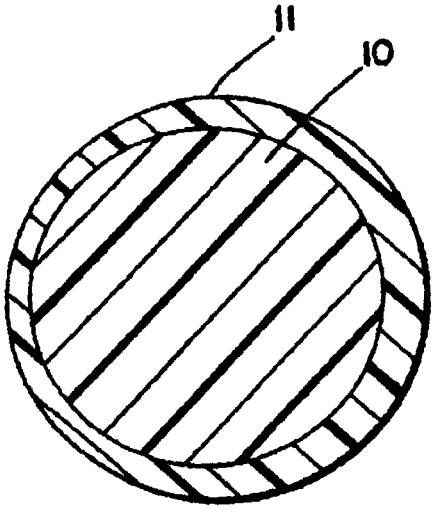

FIG. 3

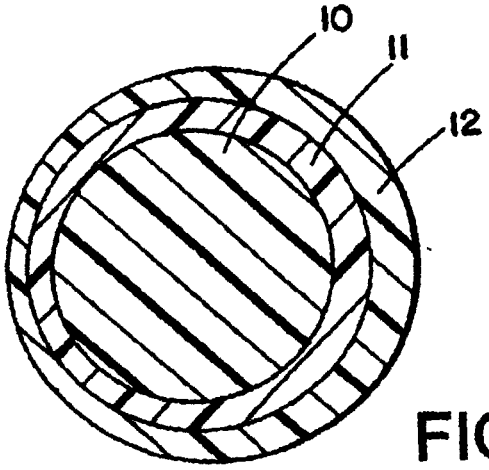

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 00 11 8668

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

A63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	5 December 2000	Lucas, P

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 11 8668

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