US 20070293346A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0293346 A1**

ROLLINSON et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **PUTTER AND EXTENSION DEVICE THEREFOR**

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(21) Appl. No.: **11/760,423**

(22) Filed: **Jun. 8, 2007**

Related U.S. Application Data

(60) Provisional application No. 60/804,411, filed on Jun. 9, 2006.

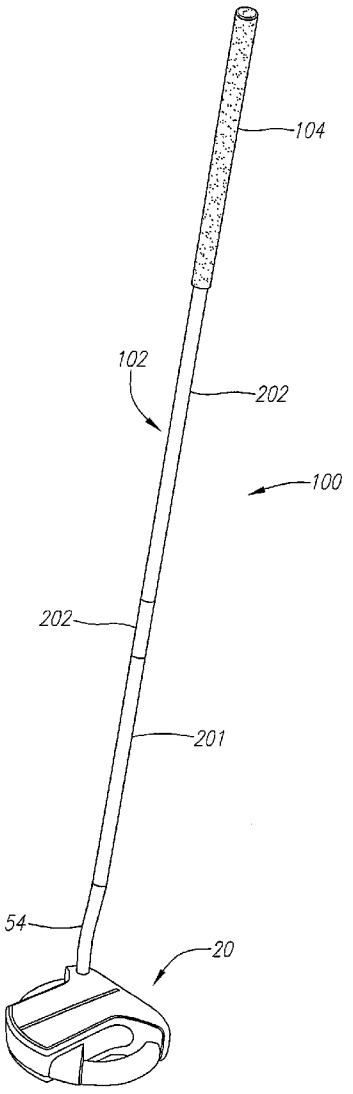
Publication Classification

(51) **Int. Cl.**
A63B 53/00 (2006.01)

(52) **U.S. Cl.** **473/340**

(57) **ABSTRACT**

A putter-type golf club with a removable central shaft portion which allows for varying the length of the putter-type golf club without varying the mass. The putter-type golf club has a club head with a lower shaft which is removably attached to a bottom end of the central shaft portion. The putter-type golf club also has an upper shaft portion which is removably attached to a top end of the central shaft portion.



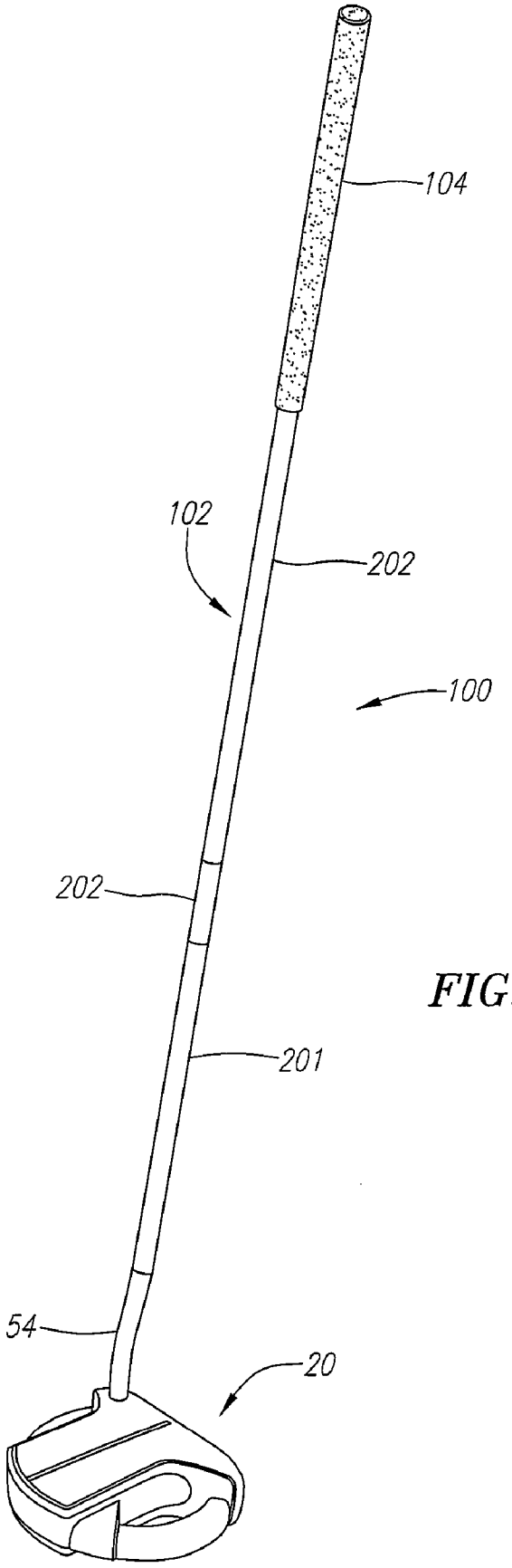


FIG. 1

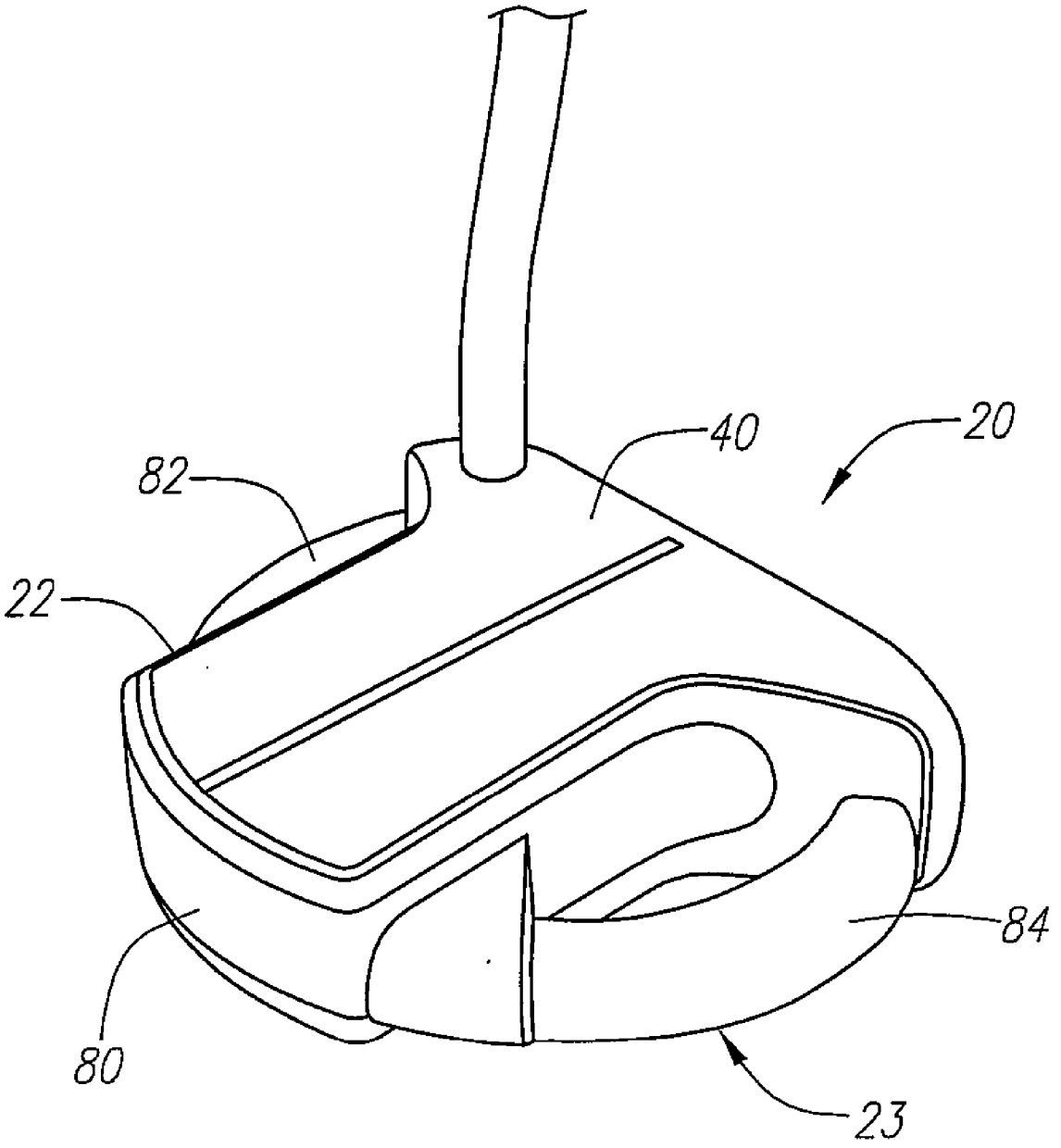


FIG. 1A

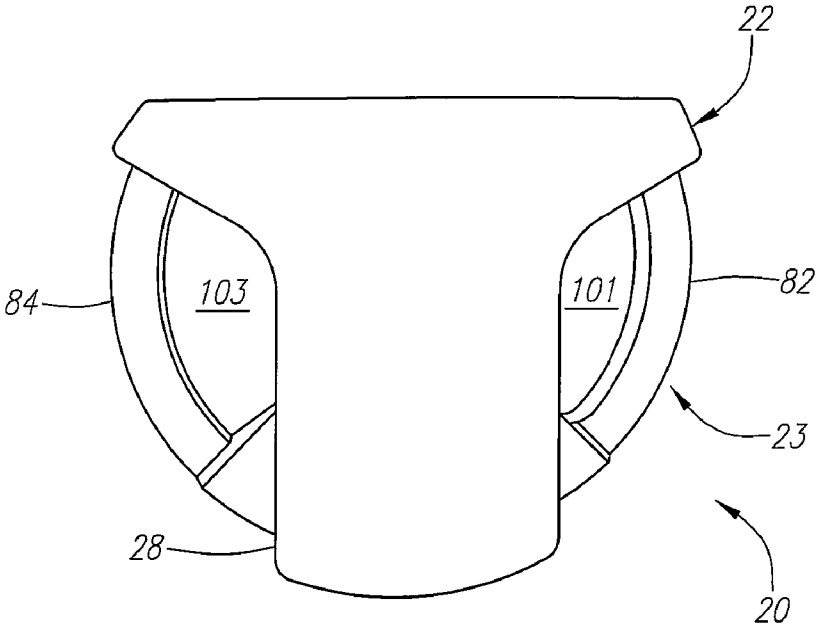


FIG. 2

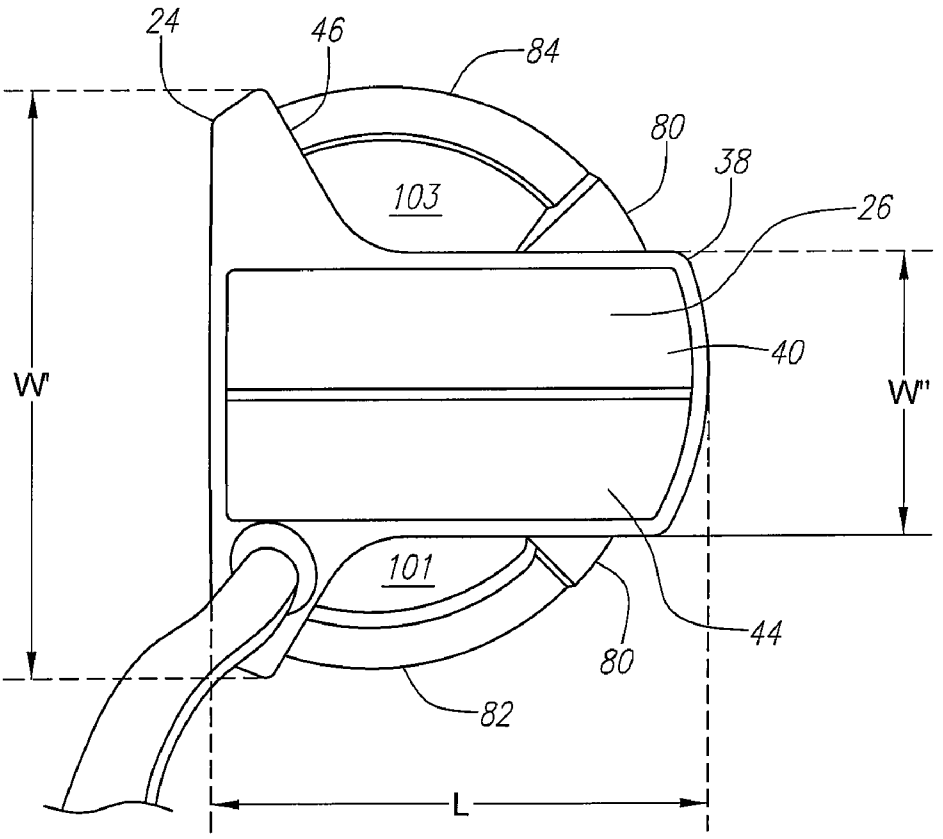


FIG. 3

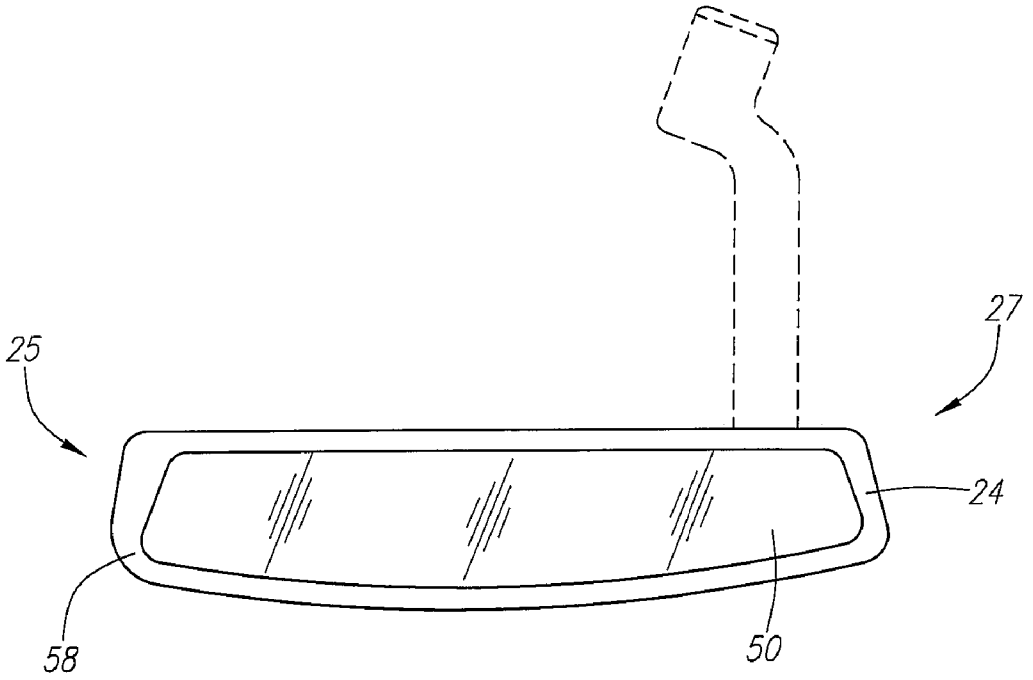


FIG. 4

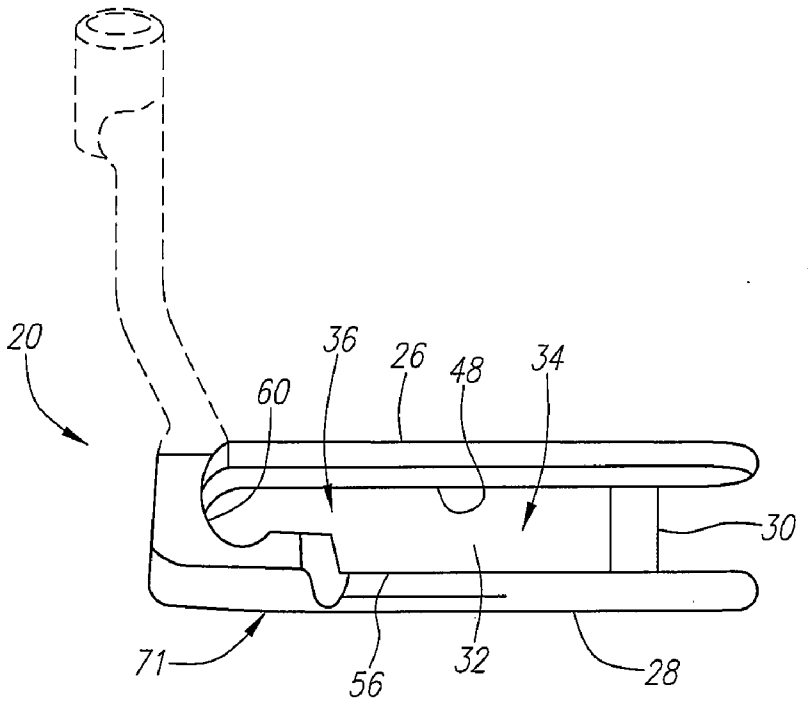


FIG. 5

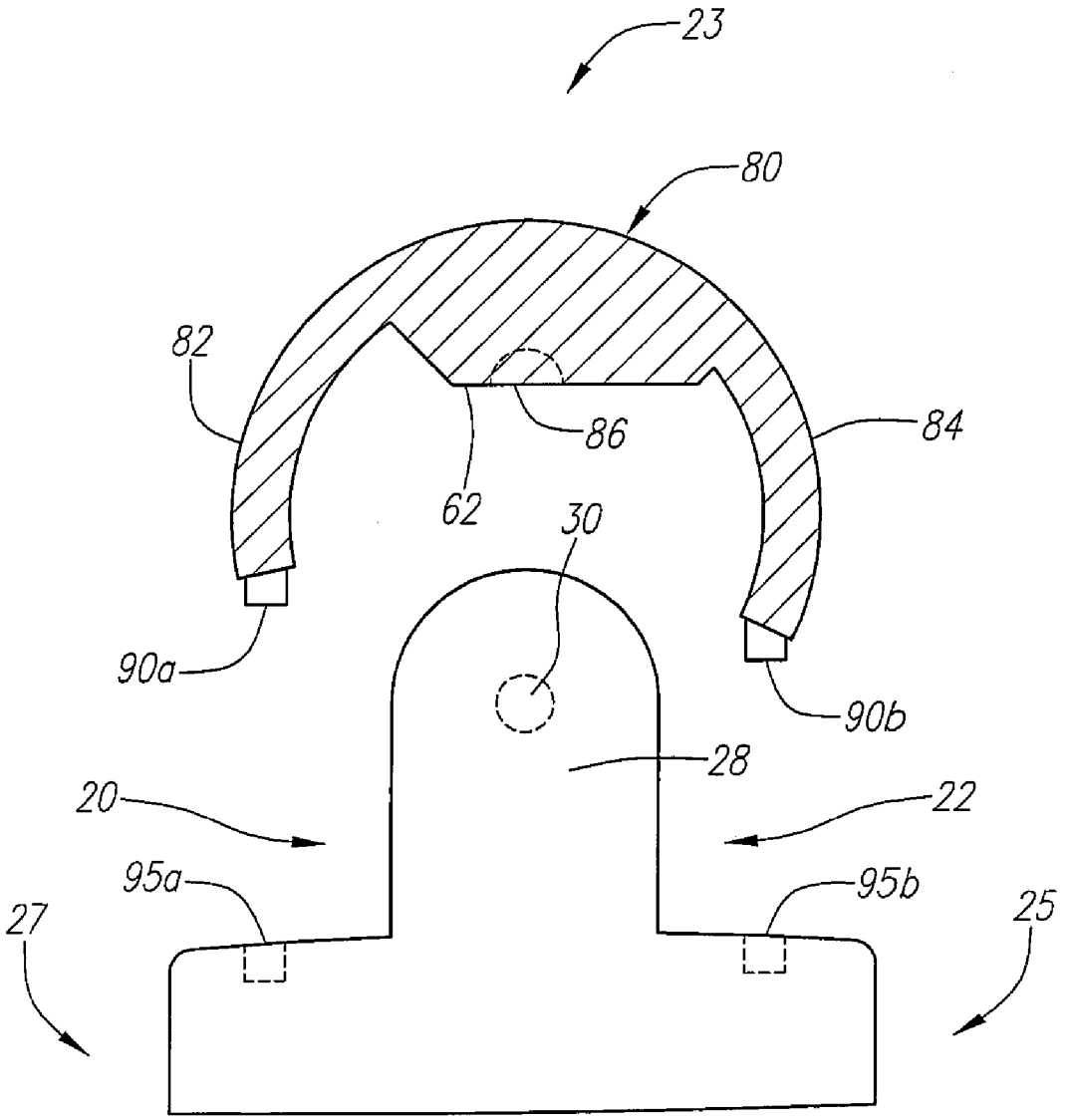


FIG. 6

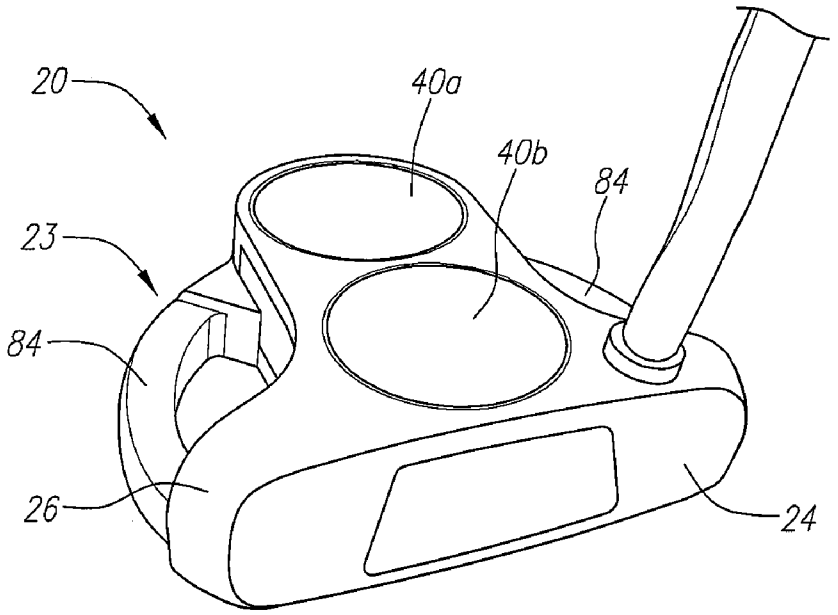


FIG. 7

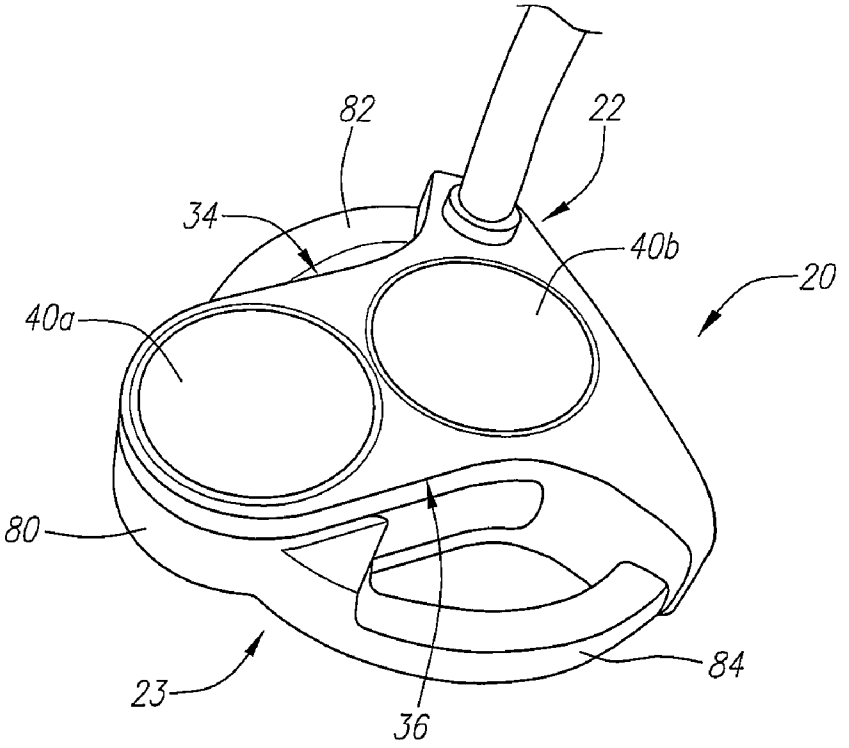


FIG. 8

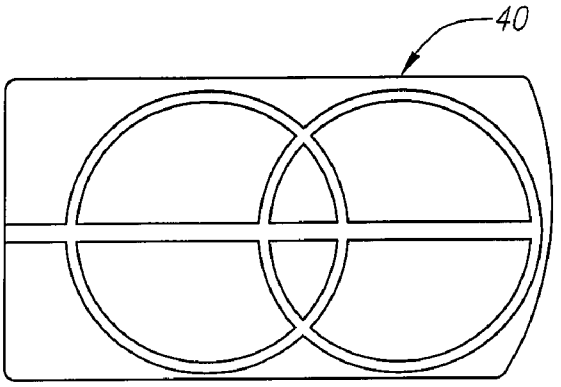


FIG. 9

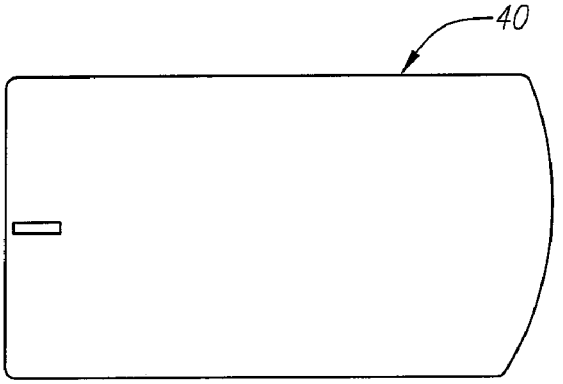


FIG. 10

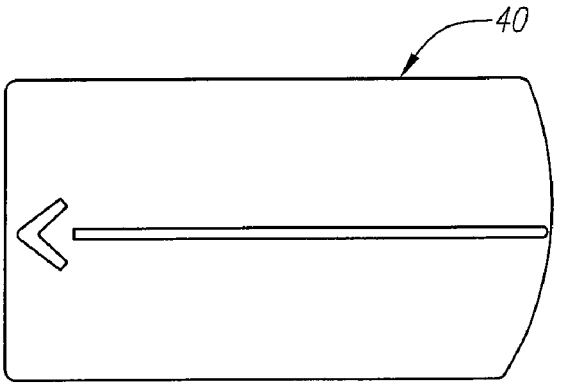


FIG. 11

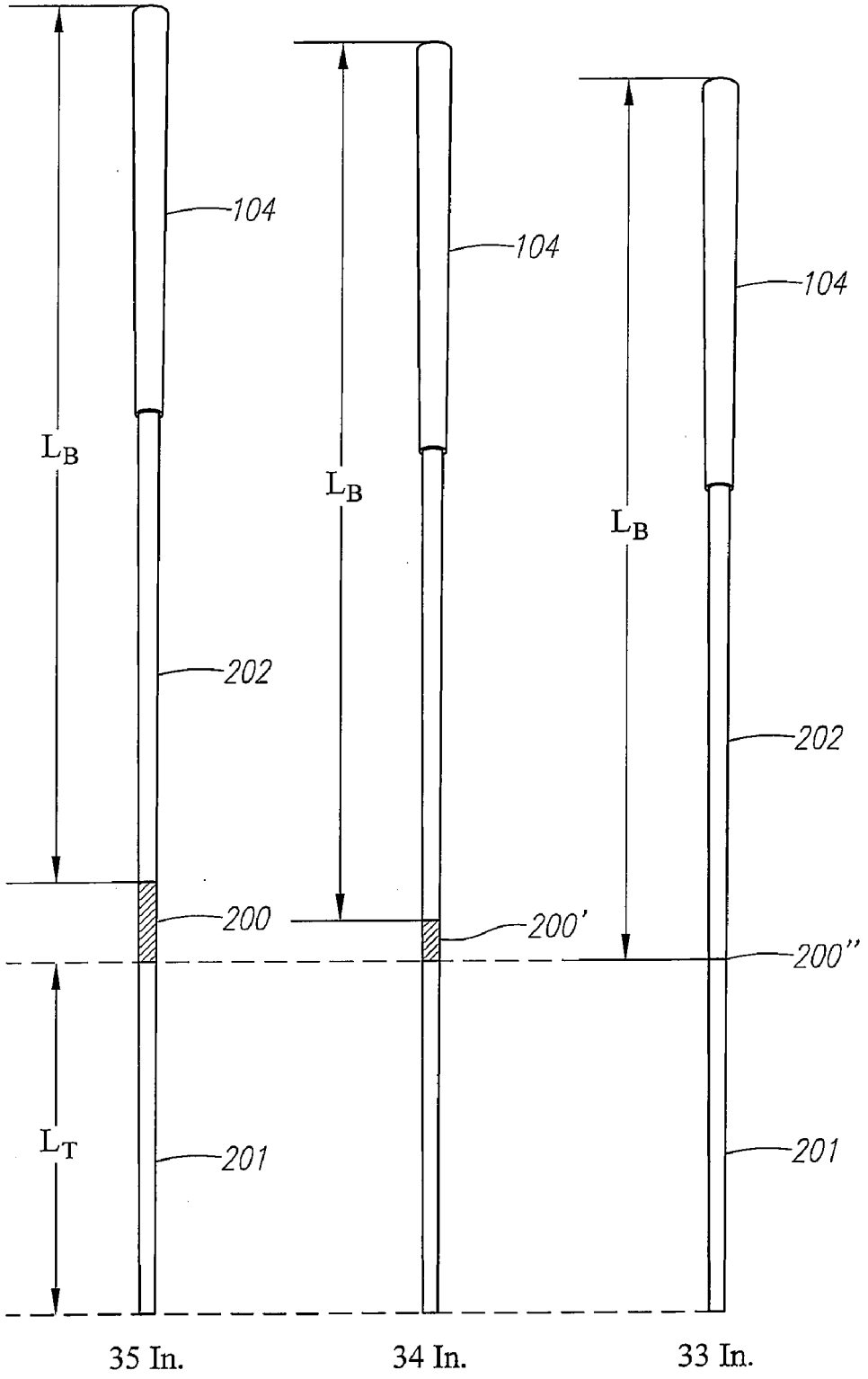

104
104
104
L_B
L_B
L_B
202
202
200
200'
200''
L_T
201
201
35 In.
34 In.
33 In.

FIG. 12

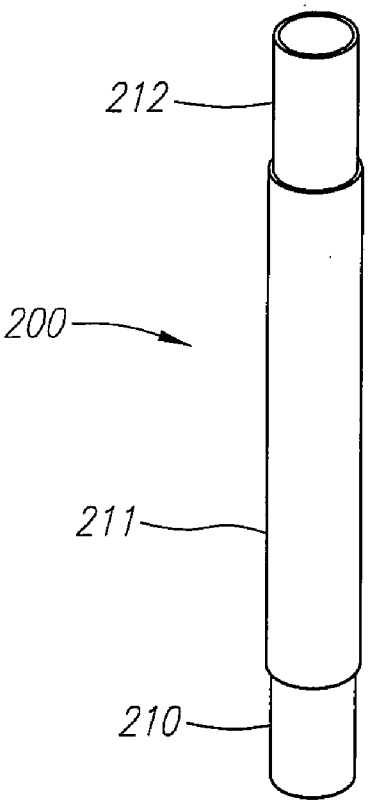


FIG. 13

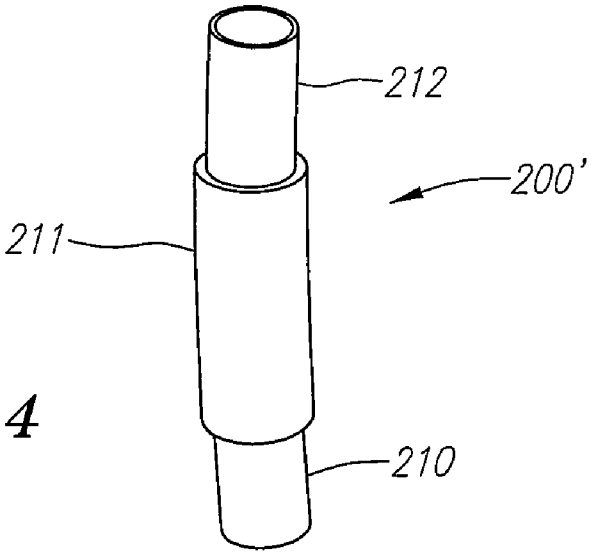


FIG. 14

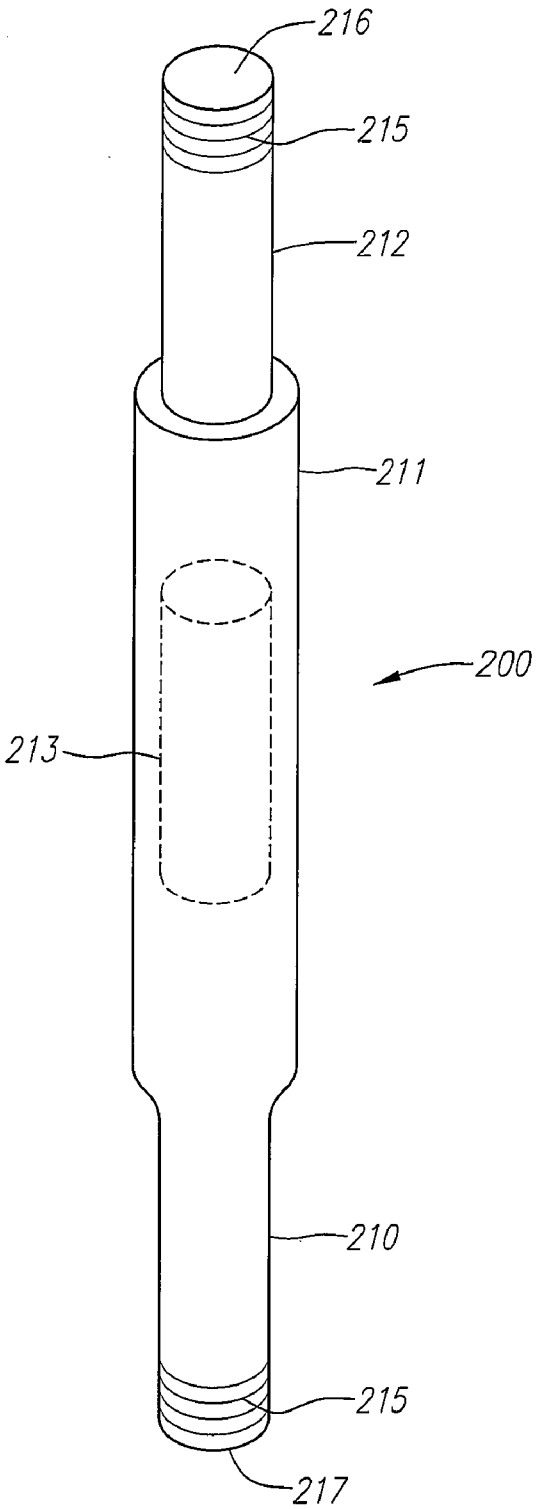


FIG. 15

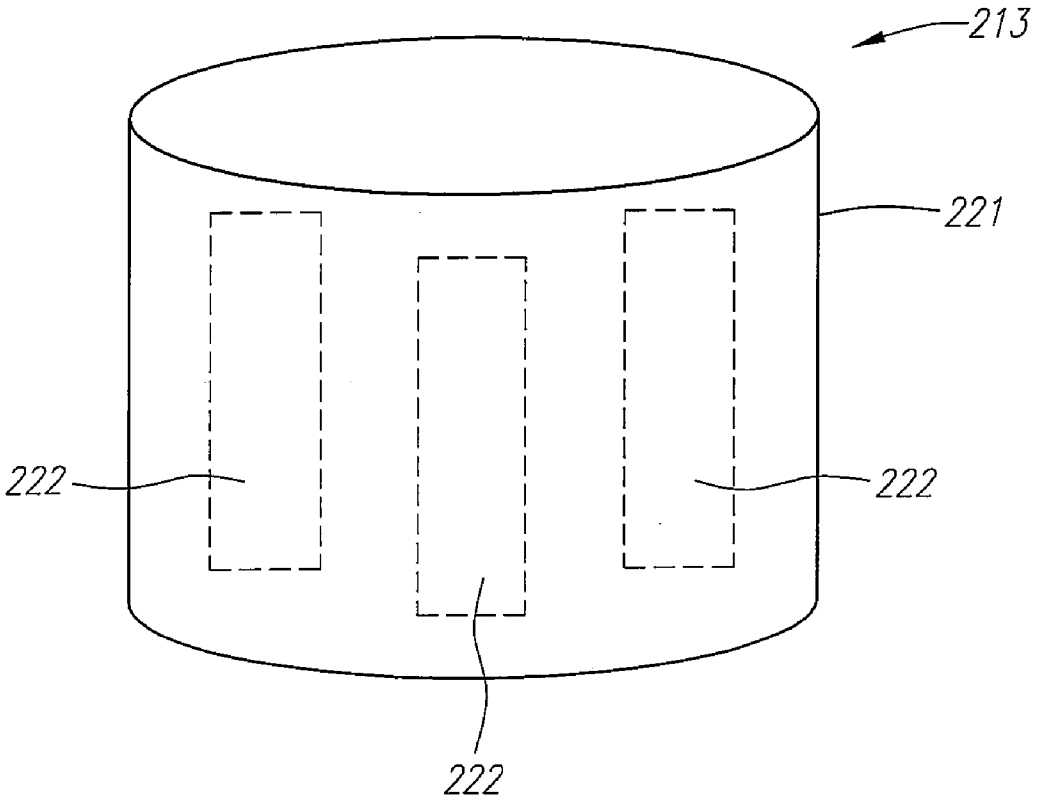


FIG. 16

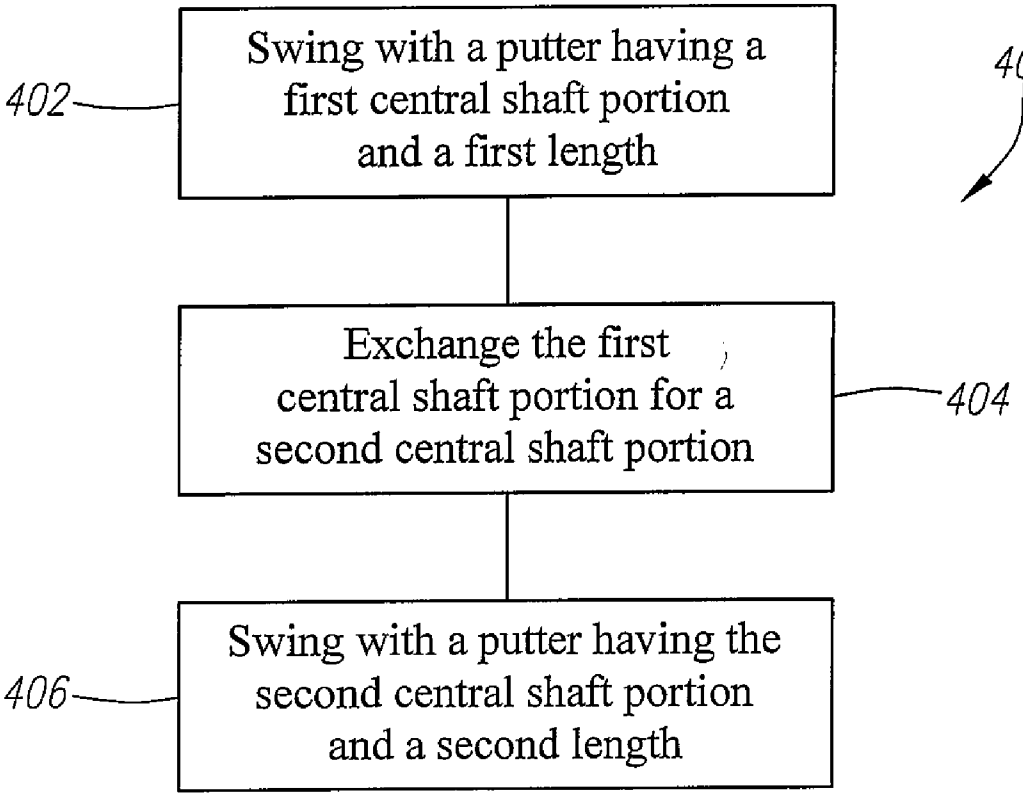
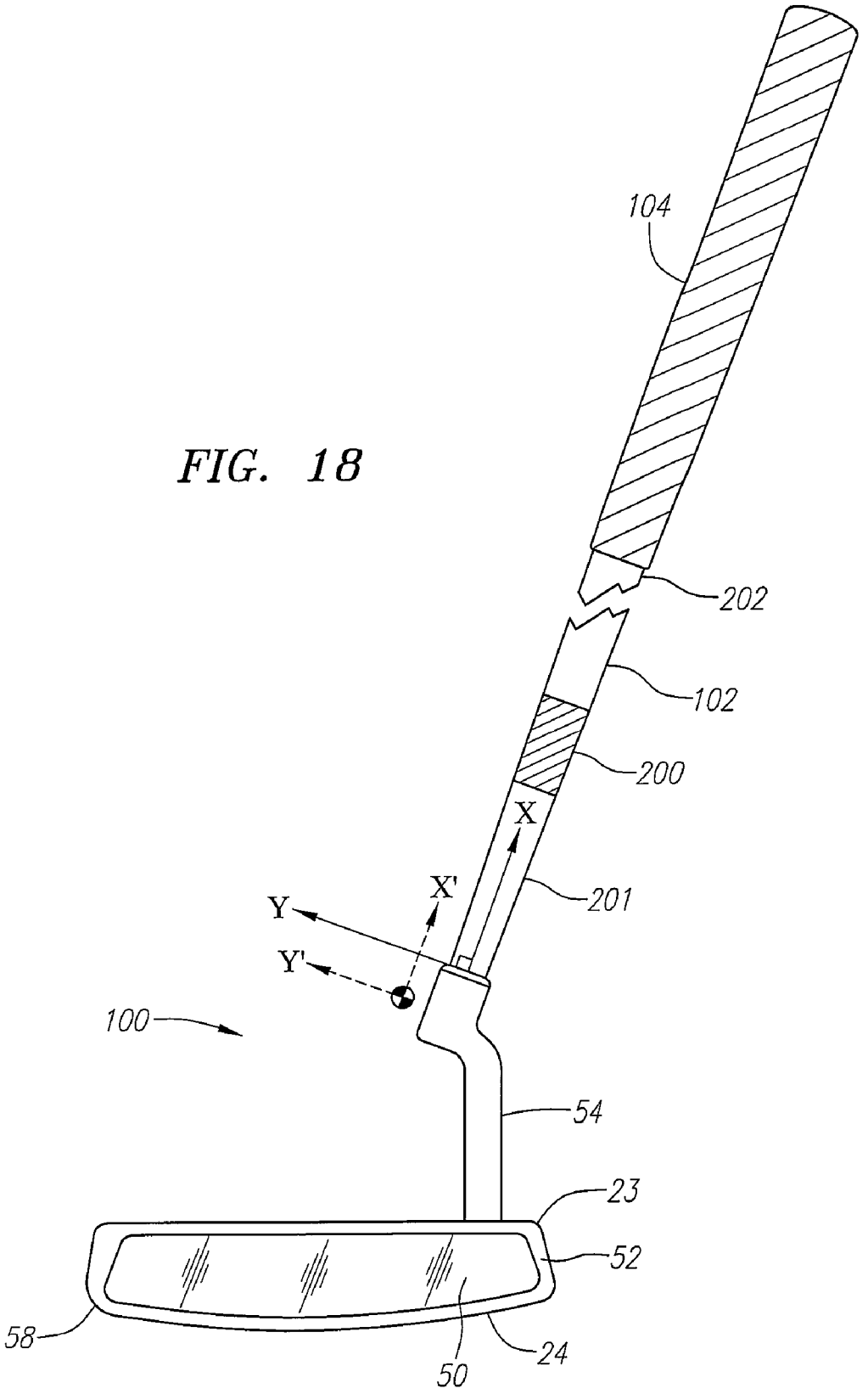

Swing with a putter having a first central shaft portion and a first length
402
400
Exchange the first central shaft portion for a second central shaft portion
404
Swing with a putter having the second central shaft portion and a second length
406

FIG. 17

FIG. 18



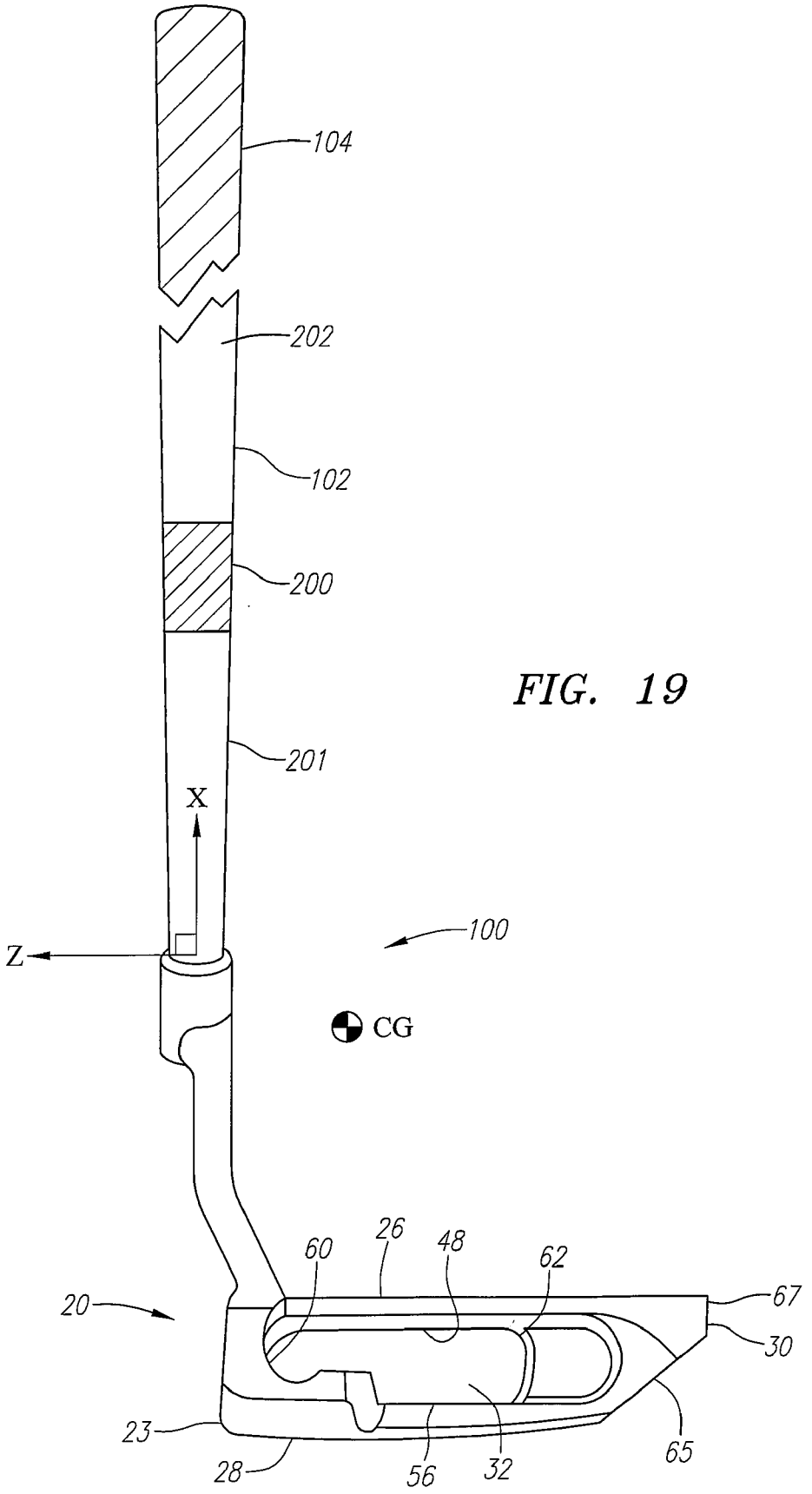


FIG. 19

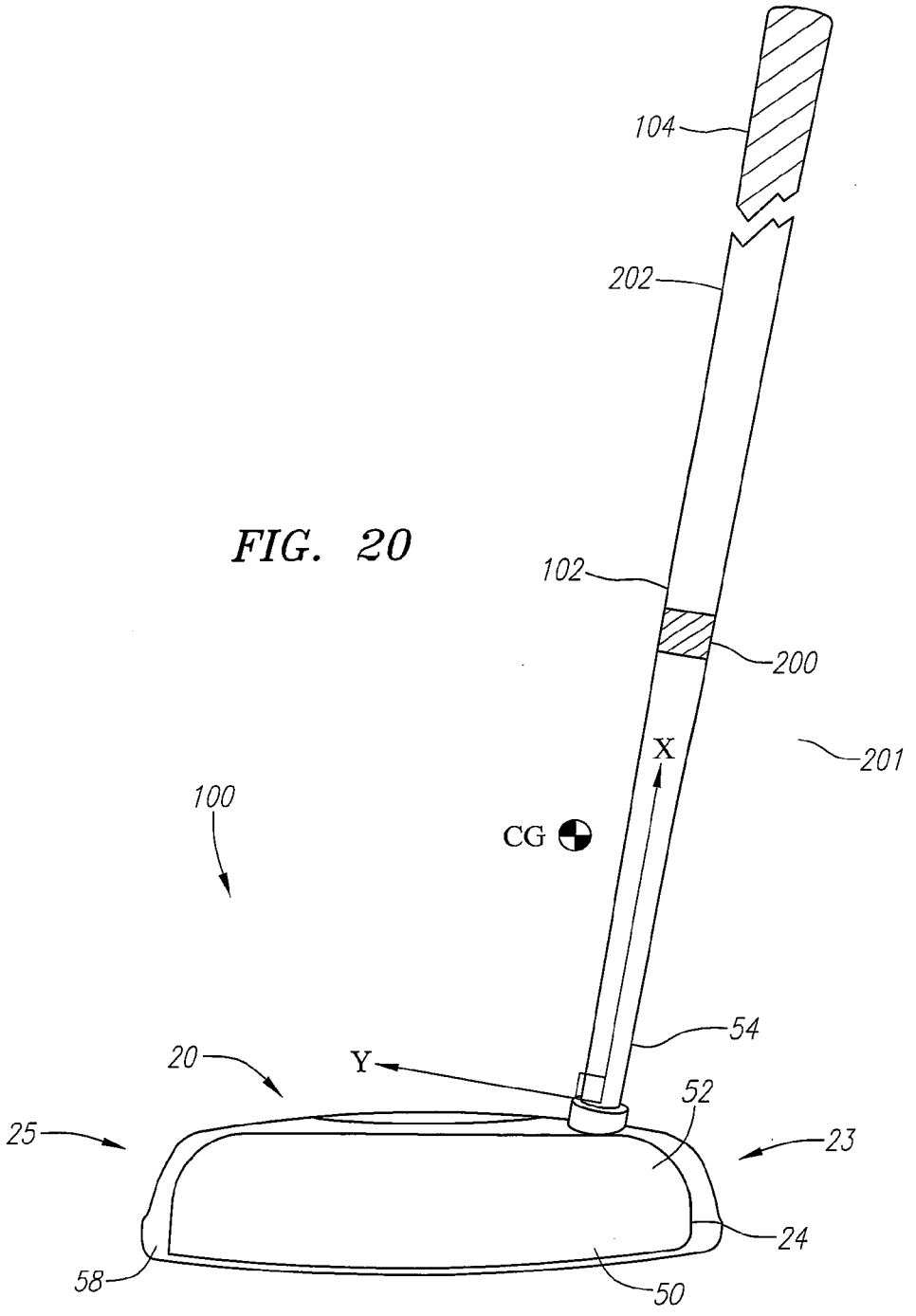


FIG. 20

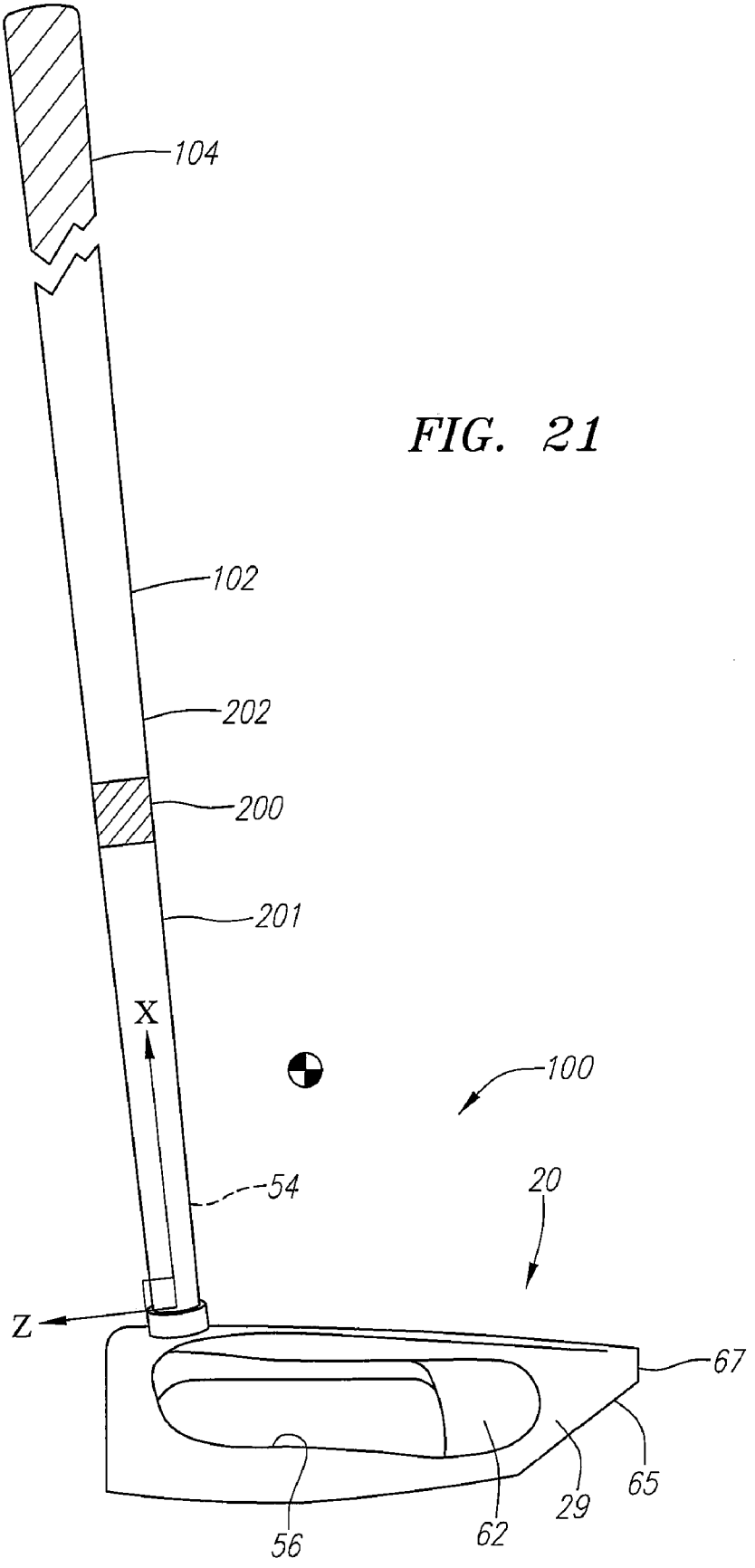


FIG. 21

PUTTER AND EXTENSION DEVICE THEREFOR

CROSS REFERENCES TO RELATED APPLICATIONS

[0001] The Present application claims priority to U.S. Provisional Patent Application No. 60/804,411, filed on Jun. 9, 2006.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

BACKGROUND OF THE INVENTION

[0003] 1. Field of the Invention

[0004] The present invention relates to a putter. More specifically, the present invention relates to a putter type golf club with an extendable portion.

[0005] 2. Description of the Related Art

[0006] The golf industry has been inventing putters that make the game of golf easier for the high handicap player. One such putter is disclosed in U.S. Pat. No. 4,688,798 to David Pelz. The Pelz patent discloses a putter with an alignment means to assist a golfer in aiming a golf ball toward a hole during putting. The Pelz patent discloses using two or three golf ball shaped indicators as the alignment means. The golf ball shaped indicators may be circles, hemispheres, or complete spheres. The Pelz patent discloses positioning the indicators along a line extending rearward from the center of percussion.

[0007] Another patent that discloses an alignment means is U.S. Pat. No. 4,659,083 to Szczepanski. The Szczepanski patent discloses a group of lines that converge toward the center of the face of the putter.

[0008] Yet another patent that discloses an alignment means is Great Britain Patent Application Number 4,659,083 to Lilley. The Lilley patent also discloses a group of lines that converge toward the center of the face of a putter.

[0009] Another example is Schmidt et al., U.S. Pat. No. 5,470,068, for a Golf Putter With Dished Bottom Surfaces which discloses a putter composed of a single cast material and having a hollow interior.

[0010] Another example is Uebelhor, U.S. Pat. No. 6,086,484, which was filed on Mar. 20, 1998 for a Golf Putter Head. Uebelhor discloses a putter head with a U-shaped body and a block within the middle. The block has a lower specific gravity than the U-shaped body.

[0011] Yet another example is Rose et al., U.S. Pat. No. 5,951,412 originally filed in January of 1996 for a Golf Club, Particularly A Putter. The Rose patent discloses a center portion composed of a light metal material and the heel and toe portions composed of heavier metals. The metals are forged or cast to create the putter head.

[0012] Another example is Fernandez, U.S. Pat. No. 4,793,616 for a Golf Club, which was originally filed in 1984, discloses a lightweight composite material molded to a hard, high density material for distribution of mass. Fernandez discloses a composite shell with a high density insert composed of tungsten or some other high density material.

[0013] Fisher, U.S. Pat. No. 6,695,708 for a Golf Putter With Polyhedral Head And Rotatably Selectable Traction Control Faces, discloses a putter with two faces of different ball impacting characteristics.

[0014] Although these inventions have provided new and improved putters for making the game of golf more enjoyable for high handicap players, the prior art has not optimized a putter by making it easily interchangeable from on striking surface to another while providing greater stability.

BRIEF SUMMARY OF THE INVENTION

[0015] The present invention discloses a putter with an extendable removable central shaft portion which allows for better club length fitting to a golfer while maintaining the putters swing weight.

[0016] One aspect of the present invention is a putter-type golf club including a club head, a central shaft portion and an upper shaft portion. The club head has a hosel and a lower shaft portion extending from the hosel. The lower shaft portion has a top end. The central shaft portion has a bottom end and a top end. The bottom end of the central shaft portion is removably connected to the top end of the lower shaft portion. The upper shaft portion has a grip end and a bottom end. The bottom end of the upper shaft portion is removably connected to the top end of the central shaft portion. The central shaft portion is selected from a plurality of central shaft portions, each of the plurality of central shaft portions having a mass within ten grams of any other of the plurality of central shaft portions, and each of the plurality of central shaft portions having a length that is different than any other of the plurality of central shaft portions.

[0017] Having briefly described the present invention, the above and further objects, features and advantages thereof will be recognized by those skilled in the pertinent art from the following detailed description of the invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0018] FIG. **1** is a top perspective view of a putter-type club head.

[0019] FIG. **2** is a bottom plan view of putter-type club head of FIG. **1**.

[0020] FIG. **3** is a top plan view of putter-type club head of FIG. **1**.

[0021] FIG. **4** is a front plan view of putter-type club head of FIG. **1**.

[0022] FIG. **5** is a heel side plan view of a body of the putter-type club head of FIG. **1**.

[0023] FIG. **6** is an exploded bottom view of the putter-type club head of FIG. **1**.

[0024] FIG. **7** is a top perspective view of an alternative embodiment of a putter-type club head.

[0025] FIG. **8** is a top perspective view of an alternative embodiment of a putter-type club head.

[0026] FIG. **9** is an isolated view of one embodiment of an alignment means for a putter-type club head.

[0027] FIG. **10** is an isolated view of one embodiment of an alignment means for a putter-type club head.

[0028] FIG. **11** is an isolated view of one embodiment of an alignment means for a putter-type club head.

[0029] FIG. **12** is a comparison of three different central shaft portions connected to lower and upper shaft portions.

[0030] FIG. **13** is an isolated view of a central shaft portion having a first length.

[0031] FIG. **14** is an isolated view of a central shaft portion having a second length.

[0032] FIG. **15** is an isolated view of a central shaft portion illustrating the mass member.

[0033] FIG. **18** is a front plan view of a putter.

[0034] FIG. **19** is a side view of the putter of FIG. **18**.

[0035] FIG. **20** is a front plan view of a putter.

[0036] FIG. **21** is a side view of the putter of FIG. **20**.

DETAILED DESCRIPTION OF THE INVENTION

[0037] As shown in FIG. **1**, a putter-type golf club **100** includes a putter-type golf club head **20**, a shaft **102** and a grip **104**. The putter-type golf club **100** has a central shaft portion **200** which is preferably removably connected to a lower shaft portion **201** and an upper shaft portion **202**. Alternatively, the central shaft portion **200** is permanently connected to the lower shaft portion **201** and upper shaft portion **202**.

[0038] The central shaft portion **200** is selected from a plurality of central shaft portions **200** in order to allow for the length of the putter-type golf club **100** to be fit to a particular golfer. Although the length of each of the plurality of central shaft portions **200** varies, the mass of each of the plurality of central shaft portions **200** is substantially the same, and preferably does not exceed a 10 grams variance, more preferably a 5 grams variance, and even more preferably a 1 gram variance. In this manner, the swing-weight of the putter-type golf club **100** is maintained even though the length may be decreased or increased.

[0039] As shown in FIG. **12**, each of the central shaft portions **200**, **200'** and **200"** have a different length, but the length of the lower shaft portion **201** and the upper shaft portion **202** remains the same. The length of each of the central shaft portions **200** preferably varies for 0.5 inch to 5 inches, more preferably from 0.0 inch to 3 inches. The central shaft portion **200** may also be used for long club length and mid-club length putters as discussed below.

[0040] As shown in FIGS. **13** and **14**, the central shaft portion has a bottom body **210**, main body **211** and a top body **212**. Ina preferred embodiment, the length of the main body **210** changes for each of the plurality of central shaft portions while the length of the bottom body **210** and the top body **212** both remain the same.

[0041] As shown in FIG. **15**, the central shaft portion **200** has a top end **216** and a bottom end **217**. The top end **216** is connected to the bottom end of the upper shaft portion **202** and the bottom end **217** is connected to the top end of the lower shaft portion **201**. Each of the top body **212** and the bottom body **210** preferably has a plurality of threads **215** for threadingly connecting the central shaft portion **200** to the lower and upper shaft portions **201** and **202**. Those skilled in the pertinent art will recognize other connection methods that may be used without departing from the scope and spirit of the present invention. In an alternative embodiment, the central shaft portion **200** is permanently connected to the other shaft portions **201** and **202** using a snap-fit connection or the like.

[0042] Also shown in FIG. **15** is a mass member **213** which is preferably disposed within the interior of the central shaft portion **200**, preferably on the interior wall of the main body **211**. The mass member **213** varies in mass between the plurality of central shaft portions **200** allowing for the swing-weight to remain constant even though the length varies. If the central shaft portion **200** is composed of graphite, then the mass member **213** is preferably composed of plies of pre-preg with a heavy mass material such as tungsten doped polymers disposed within the plies. In this manner, mass is added the mass members **213** of the shorter central shaft portions **200** to maintain the constant swing-weight.

[0043] FIG. **16** further illustrates a preferred embodiment of the mass member **213**. The mass member **213** has a body **221** with a plurality of weights **222** integrated therein. The mass member preferably has a mass ranging from 0.5 grams to 50 grams, more preferably from 1 grams to 20 grams, and more preferably from 1 gram to 10 grams.

[0044] FIG. **17** is a flow chart of a method of the invention. The method **400** begins at block **402** with swinging a first putter **100** having a first length and a first central shaft portion **200**. At block **404**, the first central shaft portion **200** is exchanged with a second central shaft portion **200'** having a different length but substantially same mass. At block **406**, the golfer swing the putter with the second central shaft portion, and now with a second length that is different than the first length even though the mass of the putter **100** remains the same.

[0045] The club head **20** may be any type of putter-type club head. A preferred club head **20** is shown in FIGS. **1A-11**. The club head **20** preferably includes a body **22** and a peripheral mass belt **23**. In a preferred embodiment, the body **22** is composed of a material having a density ranging from 0.90 g/cm^3 to 6.0 g/cm^3. A preferred metal for the body **22** is an aluminum alloy. Alternative materials for the body **22** include aluminum, titanium, titanium alloys, magnesium, magnesium alloys, and the like. The body **22** is preferably formed as a single cast structure using known investment casting techniques. However, those skilled in the pertinent art will recognize that alternative forming techniques such as milling, welding forged or formed pieces, and the like may be utilized without departing from the scope and spirit of the present invention.

[0046] The body **22** preferably weighs from 100 grams to 300 grams, more preferably from 150 grams to 200 grams, even more preferably from 160 grams to 180 grams and most preferably 170 grams.

[0047] The peripheral mass belt **23** is preferably composed of a material that has a density greater than the density of the

material of the body **22**. In a preferred embodiment, the peripheral mass belt **23** is composed of a material having a density ranging from 6.0 g/cm^3 to 20.0 g/cm^3, and more preferably from 7.0 g/cm^3 to 10.0 g/cm^3. In a preferred embodiment, the peripheral mass belt **23** is composed of stainless steel. In alternative embodiments, the peripheral mass belt **23** is composed of zinc, brass, copper, gold, silver, tungsten, tungsten-based alloys, iron-based alloys, and copper-based alloys.

[**0048**] The peripheral mass belt **23** preferably weighs from 100 grams to 300 grams, more preferably from 150 grams to 200 grams, even more preferably from 160 grams to 180 grams and most preferably 170 grams. In a most preferred embodiment, the body **22** and the peripheral mass belt **23** have the same mass or substantially the same mass. The club head **20** preferably has a mass ranging from 250 grams to 500 grams, more preferably from 300 grams to 400 grams, and most preferably 340 grams.

[**0049**] In a preferred embodiment, the body **22** has a face portion **24**, a crown portion **26**, a sole portion **28** and a column portion **30**. The face portion **24**, the crown portion **26**, the sole portion **28**, the column portion **30** and the peripheral mass belt **23** define a central aperture **32** that extends through the body **22**. The central aperture **32** has a heel opening **34** at a heel end **27** of the body **22** and a toe opening **36** at a toe end **25** of the body **22**. The central aperture **32** horizontally separates the face portion **24** from the peripheral mass belt **23**, and the central aperture **32** vertically separates the crown portion **26** from the sole portion **28**. The central aperture **32**, in connection with the peripheral mass belt **23**, allows for the center of gravity of the club head **20**, CG, to be moved rearward from the face portion **24**. In a preferred embodiment, the CG of the club head **20** is positioned within the central aperture **32**, and thus the CG is not positioned within material of the club head **20** but instead the CG lies outside the material in space within the central aperture **32**. Preferably, the CG is located between 0.25 inch and 1.0 inch from an external surface **71** of the sole portion **28**, more preferably 0.50 inch to 0.75 inch, and most preferably 0.73 inch from the external surface **71** of the sole portion **28**. Also, preferably the CG of the club head **20** is located 0.50 inch to 2.5 inches rearward from the external surface **58** of the face portion **24**, more preferably 0.75 inch to 1.5 inches, and most preferably 0.944 inch from the external surface **58** of the face portion **24**.

[**0050**] In addition to assisting in the rearward positioning of the CG, the peripheral mass belt **23** is a rearward support structure for crown portion **26**. The peripheral mass belt **23** preferably ranges from 20 to 50 volume percent of the club head **20** and ranges from 40 to 75 weight percent of the club head **20**.

[**0051**] The sole portion **28** preferably has an approximate T-shape. The external surface **71** of the sole portion **28** contacts the ground when the club head **20** is used with a shaft and grip, both not shown, as a putter. The CG of the club head **20** preferably lies above the sole portion **28**.

[**0052**] The crown portion **26** extends rearward from the face portion **24**. The crown portion **26** has a central elongated section **44** and a front section **46**. The front section **46** has a width w' that extends from the heel end **23** to the toe end **25** of the face portion **24**, and gradually narrows as the front section **46** transitions into the central elongated section **44**. The width, w', preferably ranges from 2.5 inches to 5.0 inches, more preferably from 3.5 inches to 4.5 inches, and most preferably 4.25 inches. The central elongated section **44** has a width w" that is less than the width w' of the front section **46**. The width, w", preferably ranges from 1.0 inch to 3.0 inches, more preferably from 1.5 inches to 2.25 inches, and most preferably 1.8 inches. The internal surface **48** of the crown portion **26** partially defines the central aperture **32**. The crown portion preferably has a thickness that ranges from 0.10 inch to 0.50 inch, more preferably 0.15 inch to 0.30 inch.

[**0053**] The external surface **38** of the crown portion **26** preferably has an alignment means **40** thereon. The external surface **38** also preferably has a cylindrical rod **54** extending upward therefrom for engagement with a shaft, not shown. As shown in FIGS. **7** and **8**, a preferred alignment means **40** is first and second inserts **40***a* and **40***b* disposed within first and second recesses in the crown portion **26**. The depth of each of the recesses is preferably within 0.05 inch to 0.50 inch, more preferably 0.1 inch to 0.250 inch. Each of the circular inserts **40***a* and **40***b* preferably have a thickness ranging from 0.05 inch to 0.50 inch, more preferably 0.1 inch to 0.250 inch.

[**0054**] In a preferred embodiment, each of the circular inserts **40***a* and **40***b* are preferably composed of a thermosetting polyurethane material such as described in U.S. Pat. No. 6,273,831, entitled Golf Club Head with A Polymer Insert, assigned to Callaway Golf (the assignee of the Present Application), which is hereby incorporated by reference in its entirety. Alternatively, each of the circular inserts **40***a* and **40***b* may be composed of a thermoplastic polyurethane. Each of the circular inserts **40***a* and **40***b* is preferably colored white, through painting or doping of the polyurethane with coloring agents, and each circular insert **40***a* and **40***b* preferably has a texture of a golf ball cover. Each of the circular inserts **40***a* and **40***b* preferably has a diameter ranging from 1.62 inches to 1.70 inches, and most preferably 1.68 inches. Those skilled in the art will recognize that more than two circular inserts **40***a* and **40***b* may be utilized without departing from the scope and spirit of the present invention.

[**0055**] Alternative alignment means are disclosed in U.S. Pat. No. 4,688,798, entitled Golf Club And Head Including Alignment Indicators, assigned to the Callaway Golf (the assignee of the Present application), which pertinent parts are hereby incorporated by reference. As disclosed in U.S. Pat. No. 4,688,798, the alignment means assists a golfer in properly aiming a golf ball toward a hole when putting. Alternative alignment means, including a large white strip may be utilized in the present invention.

[**0056**] FIGS. **9-11** illustrate various alignment means **40** for the club head **20**. In these embodiments, the alignments means is a relatively flat strip of a composite material or a thermoplastic material which is placed within a recess, not shown, in the crown portion **26** of the body **22**.

[**0057**] Other examples of such putter-type golf club heads which may be used in the putter type golf club **100** are described in the following U.S. patents, all of which are hereby incorporated by reference in their entireties: Byrne et al., U.S. Pat. No. 6,878,074, for a Golf Club Head Composed of a Damascene Patterned Metal; Dewanjee et al., U.S. Pat. No. 6,893,358, for a Putter-Type Golf Club Head

With An Insert; Tang et al, U.S. Pat. No. 6,905,420, for a Putter Head; Dewanjee et al. U.S. Pat. No. 6,971,960, for an Insert For Golf Club Head; Tang et al., U.S. Pat. No. 6,974,394, for a Putter Head; Hettinger et al., U.S. Pat. No. 6,984,181, for a Multiple Material Golf Putter Head; Breier et al., U.S. Pat. No. 7,048,648, for a Putter-Type Golf Club Head With An Insert.

[0058] An alternative embodiment of a putter **100** is shown in FIGS. **18-21**, which also illustrate a reference frame for measuring the center of gravity of the putter **100**, which is different than the center of gravity for the club head **20**. The putter **100** generally includes the putter club head **20**, a shaft **102** and a grip **104**. In one embodiment, the putter **100** has a conventional club length that preferably ranges from 33 inches to 36 inches, and a mass that preferably ranges from 475 grams to 525 grams.

[0059] In another embodiment, the putter **100** has a mid-club length that preferably ranges from 41 inches to 45 inches, and a mass that preferably ranges from 665 grams to 700 grams. In this mid-length embodiment, the shaft **102** preferably has a mss that ranges from 160 grams to 175 grams and the grip **104** preferably has a mass that ranges from 135 grams to 145 grams. The loft angle is preferably three degrees and the lie angle is preferably 72 degrees.

[0060] In yet another embodiment, the putter **100** has a long-club length that preferably ranges from 46 inches to 50 inches, and a mass that preferably ranges from 730 grams to 775 grams. In this long-length embodiment, the shaft **102** preferably has a mass that ranges from 160 grams to 175 grams. This long-length embodiment preferably has two grips **104** (the second grip not shown) with the top grip **104** preferably having a mass that ranges from 45 grams to 50 grams, and a bottom grip (not shown) having a mass that preferably ranges from 95 grams to 105 grams. The loft angle is preferably three degrees and the lie angle is preferably 78 degrees.

[0061] From the foregoing it is believed that those skilled in the pertinent art will recognize the meritorious advancement of this invention and will readily understand that while the present invention has been described in association with a preferred embodiment thereof, and other embodiments illustrated in the accompanying drawings, numerous changes, modifications and substitutions of equivalents may be made therein without departing from the spirit and scope of this invention which is intended to be unlimited by the foregoing except as may appear in the following appended claims. Therefore, the embodiments of the invention in which an exclusive property or privilege is claimed are defined in the following appended claims.

We claim as our invention:

1. A putter-type golf club comprising:

a club head having a hosel and a lower shaft portion extending from the hosel, the lower shaft portion having a top end;

a central shaft portion having a bottom end and a top end, the bottom end of the central shaft portion removably connected to the top end of the lower shaft portion; and

an upper shaft portion having a grip end and a bottom end, the bottom end of the upper shaft portion removably connected to the top end of the central shaft portion;

wherein the central shaft portion is selected from a plurality of central shaft portions, each of the plurality of central shaft portions having a mass within ten grams of any other of the plurality of central shaft portions, and each of the plurality of central shaft portions having a length that is different than any other of the plurality of central shaft portions.

2. The putter-type golf club according to claim 1 wherein the plurality of central shaft portions comprises having a first central shaft portion having a length of 4 inches and a second central shaft portion having a length of 6 inches.

3. The putter-type golf club according to claim 1 wherein each of the plurality of central shaft portions comprises a mass member disposed within an outer wall, the mass member having a mass ranging from 5 grams to 35 grams.

4. The putter-type golf club according to claim 1 wherein each of the plurality of central shaft portions comprises a main body having a first outer diameter value, a top body having a second outer diameter value less than the first outer diameter value, and a bottom body having a third outer diameter value less than the first outer diameter value.

5. The putter-type golf club according to claim 4 wherein the length of the top body of each of the plurality of central shaft portions is the same, and the length of the bottom body of each of the plurality of central shaft portions is the same.

6. The putter-type golf club according to claim 1 further comprising a grip attached to the upper shaft portion.

7. The putter-type golf club according to claim 1 wherein the central shaft portion is threadingly connected to the lower shaft portion and the upper shaft portion.

8. The putter-type golf club according to claim 1 wherein the lower shaft portion, the upper shaft portion and the central shaft portion are composed of a graphite material.

9. The putter-type golf club according to claim 1 wherein the lower shaft portion, the upper shaft portion and the central shaft portion are composed of a steel material.

10. A method of fitting a putter-type golf club to a golfer, the method comprising:

putting with the putter-type golf club having a first length, the putter-type golf club having a removable first central shaft portion;

exchanging the first central shaft portion with a second central shaft portion, the second central shaft portion having a length that is different than the length of the first central shaft portion and a mass within ten grams of the first central shaft portion, wherein the swing-weight of the putter-type golf club remains substantially the same;

putting with the putter-type golf club having the second central shaft portion and a second length that is different than the first length.

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