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(54) **ADJUSTABLE AND CONVERTIBLE PUTTER**

(52) **U.S. Cl.**

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(57) **ABSTRACT**

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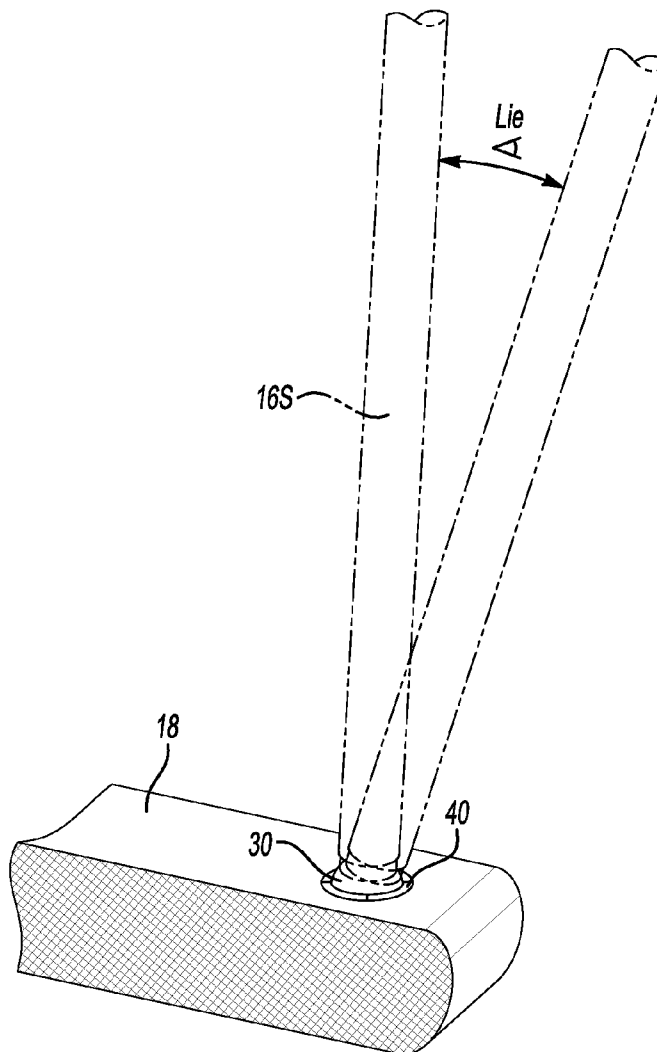
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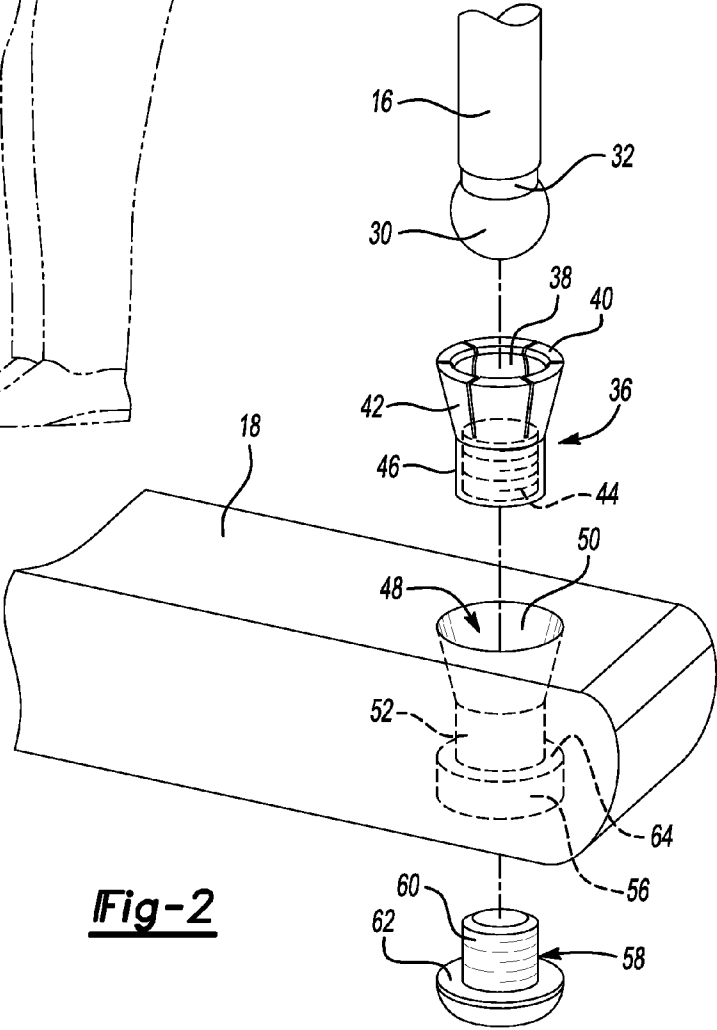
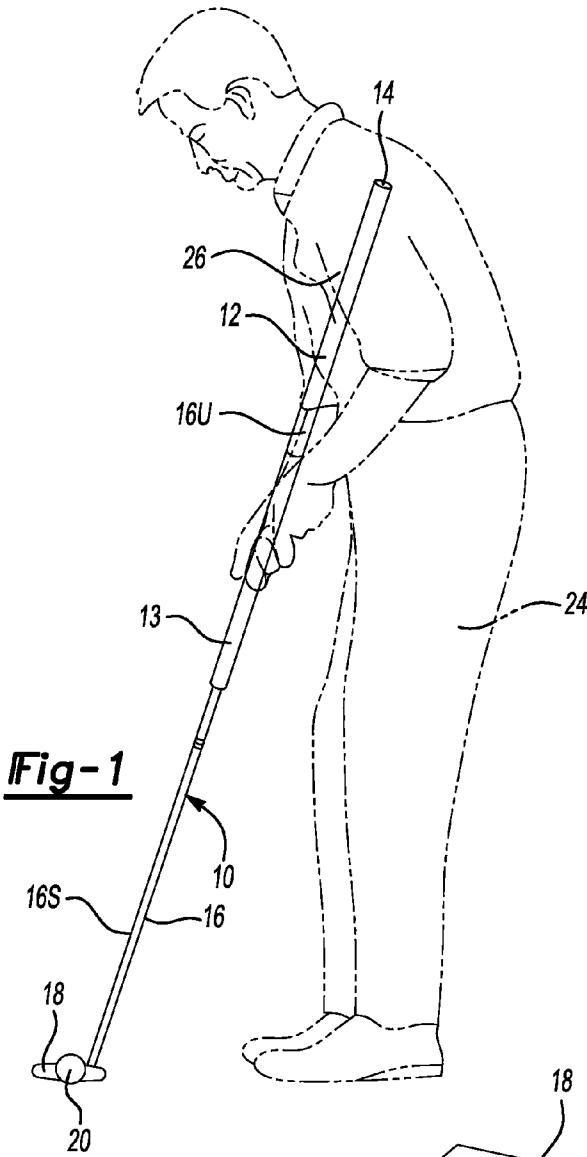
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An adjustable and convertible putter is provided for use with any of the conventional putting styles or with an underarm putting style. The putter has a head connected to the shaft with an adjustable connector that permits the lie angle and the loft angle to both be adjusted within a wide range of angular orientations. A shaft connector assembly may be provided on the shaft with a first portion of the connector assembly being assembled to the lower portion of the shaft and a second portion of the connector assembly being attached to an upper portion of the shaft. The upper portion of the shaft may be provided in a length appropriate for an underarm putter, a belly putter, or a long putter.

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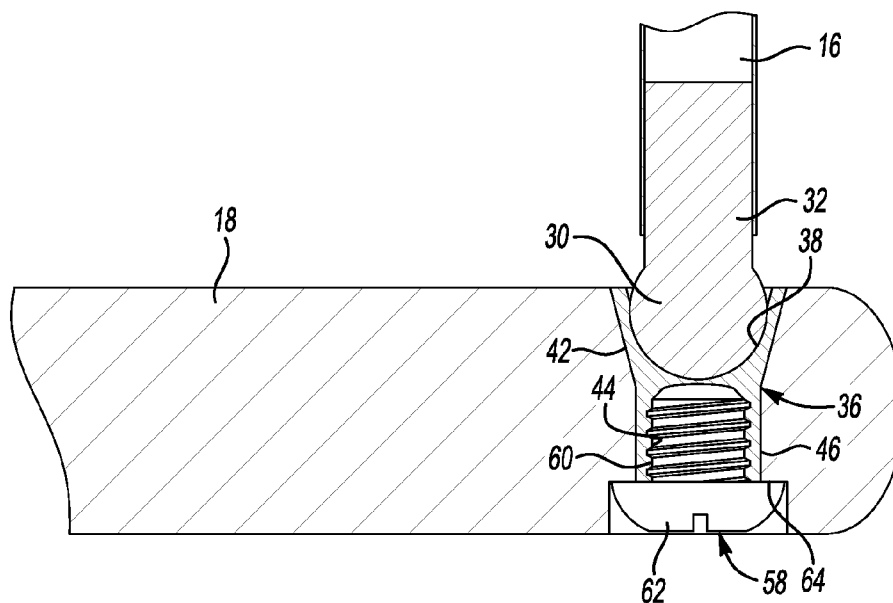


Fig-3

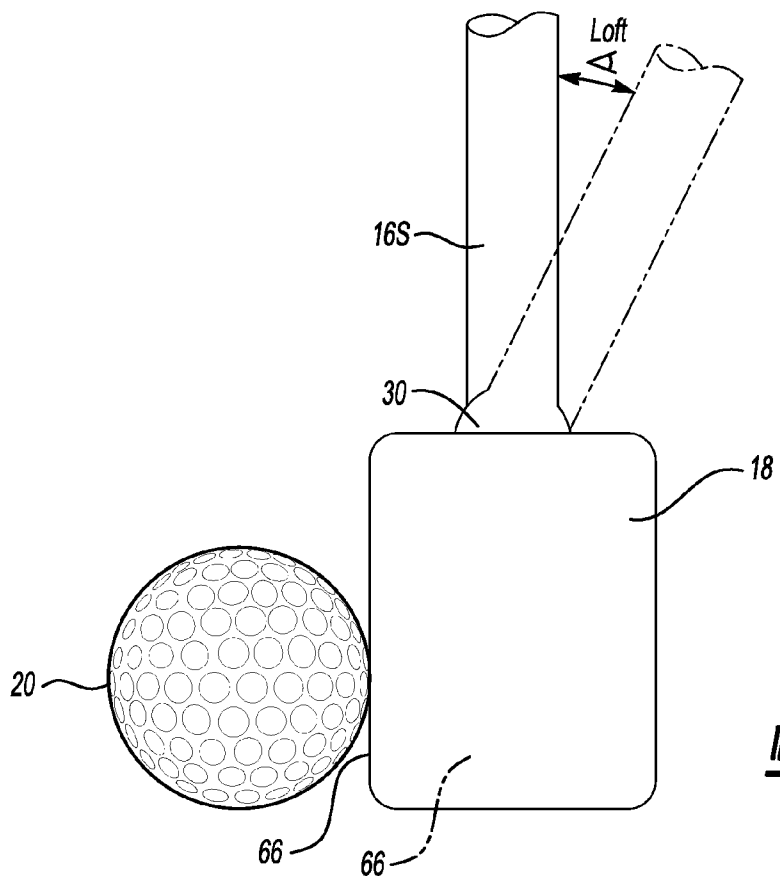
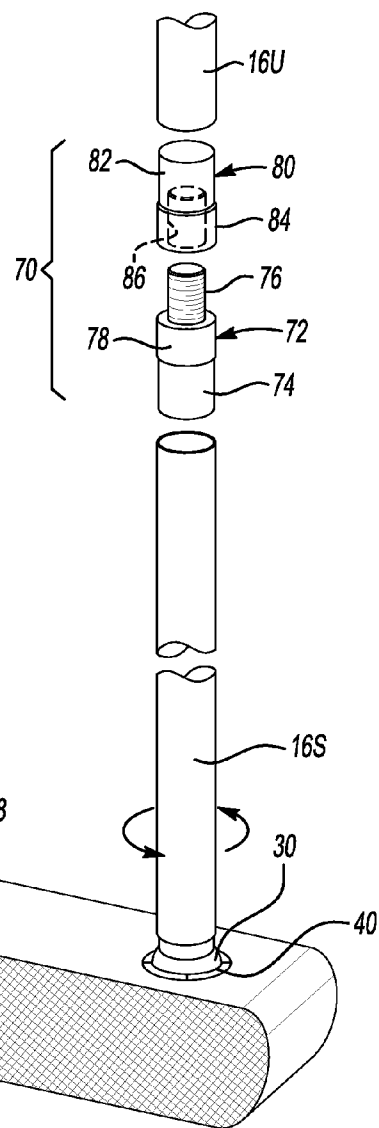
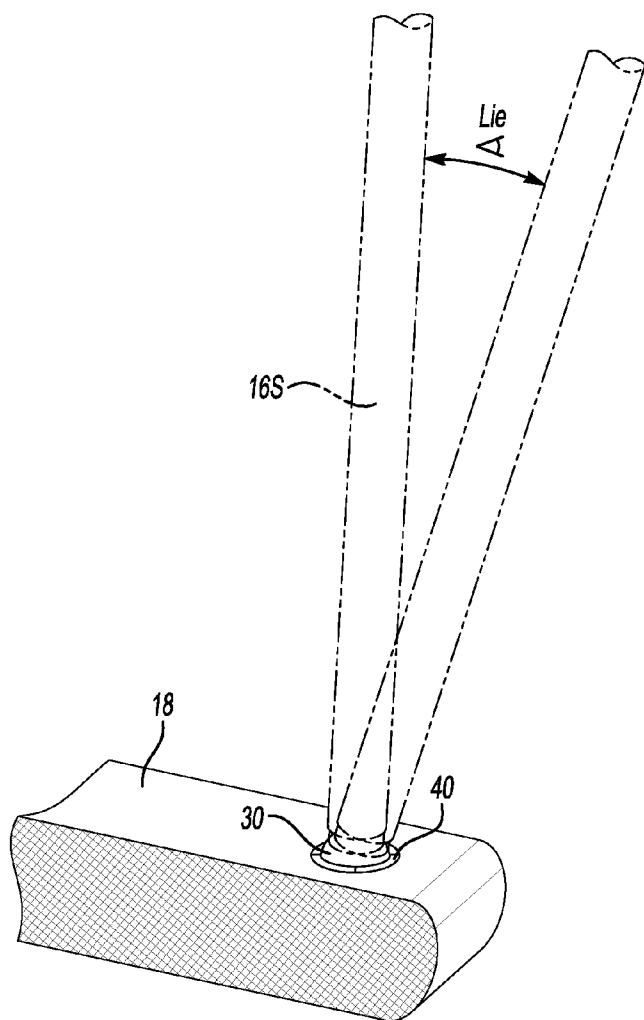


Fig-4



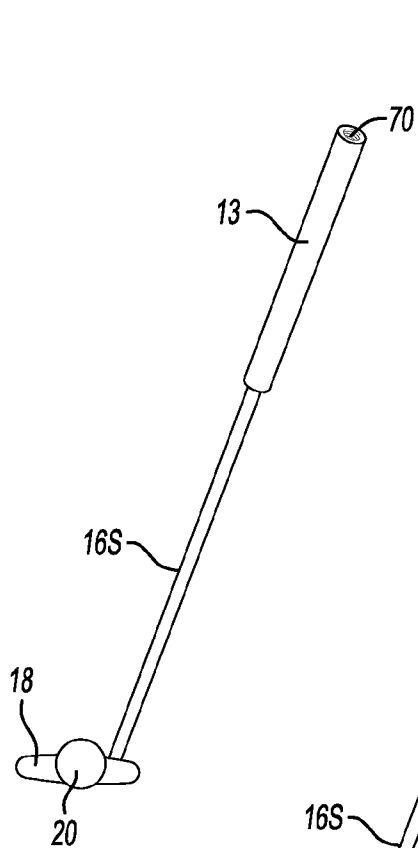


Fig-7

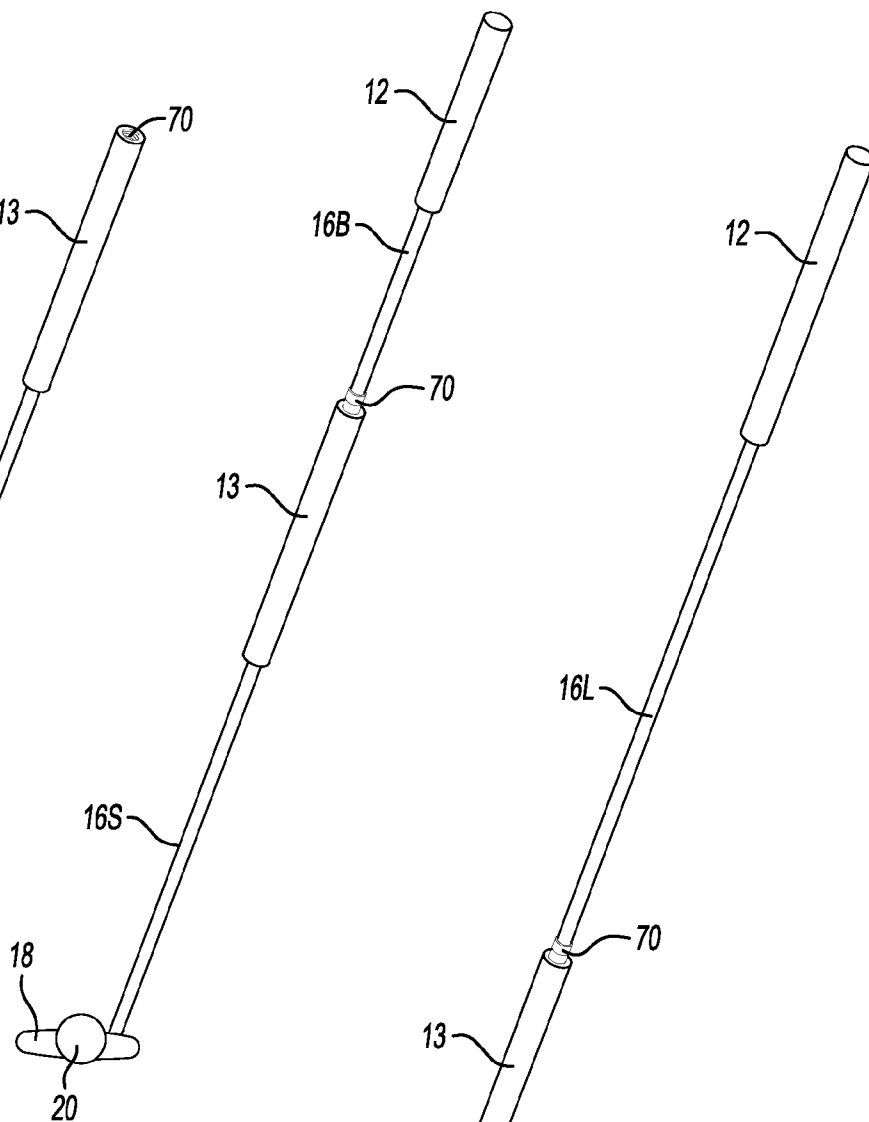


Fig-8

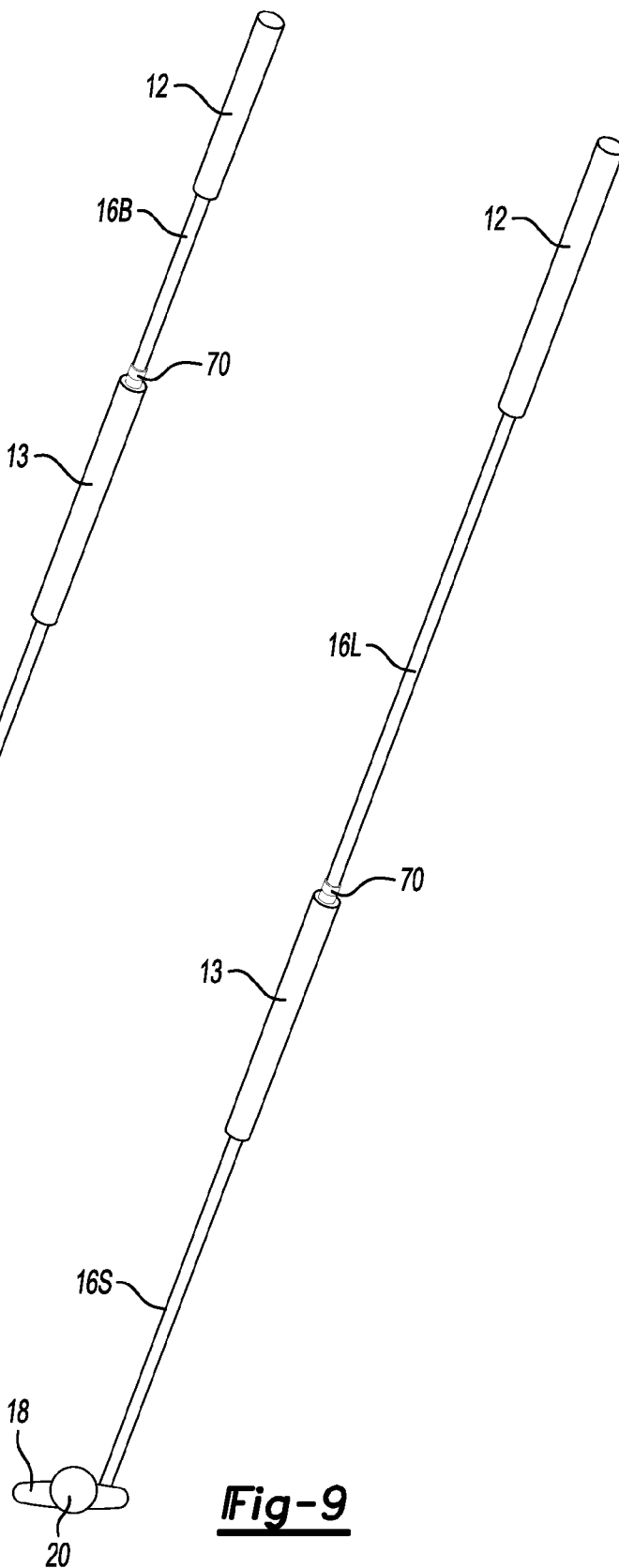


Fig-9

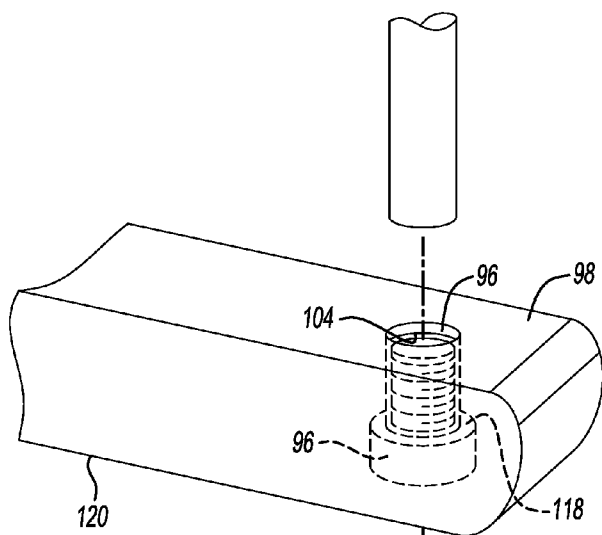


Fig-10

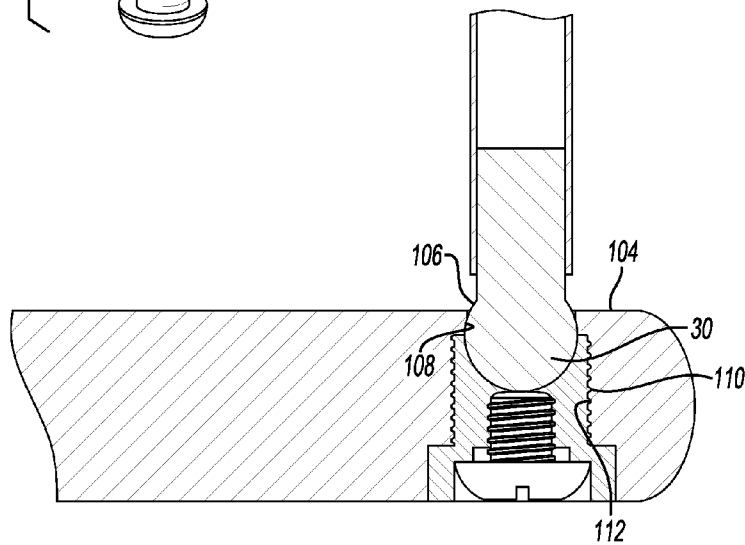
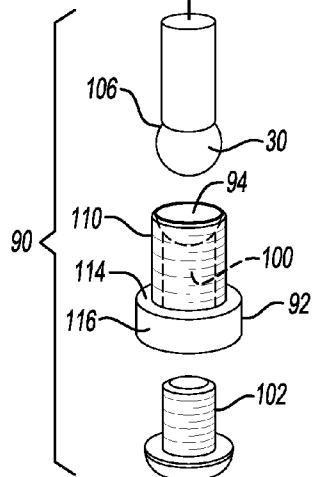


Fig-11

ADJUSTABLE AND CONVERTIBLE PUTTER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. provisional application Ser. No. 61/257,521 filed Mar. 15, 2013 the disclosure of which is hereby incorporated in its entirety by reference herein.

TECHNICAL FIELD

[0002] This disclosure relates to a putter used in the sport of golf.

BACKGROUND

[0003] One of the most important aspects of the game of golf is putting. A wide variety of putters have been developed over the years in an effort to provide every golfer with the putter that has the desired feel and, hopefully, produces the desired result as more one putts.

[0004] Conventional putters include a putter head attached to the lower end of a shaft and a grip that is provided on the upper end of the shaft. Putter heads may be one of many types of blades or one of many widely varied types of mallets. Putters generally are provided with a shaft that is of a fixed length with a grip provided at the upper end of the shaft or provided at the upper end with an auxiliary or intermediate grip provided below the grip at the upper end.

[0005] There are four accepted putting styles that are currently in use that are normally used with one of three different length putters. A standard length putter used in the standard putting style has a shaft that is approximately 800 mm to 900 mm and may be shorter for women or children or longer for taller men. A belly putter is used in the belly putting style and generally has a shaft of 950 mm to 1100 mm in length and is designed to be anchored against the stomach of a golfer. A long putter is used in the long putting style and has a shaft that is longer than 1100 mm and is designed to be anchored at the chest or chin of a golfer. A golfer using "side-saddle" putting style also may utilize the long putter.

[0006] Putters are generally purchased in standard combinations of the head shaft and grip and are not adjustable or convertible in any way. If a golfer, after purchasing a standard length putter, wishes to try a belly putter or a long putter, he must purchase a completely different putter.

[0007] The loft (vertical face angle) and lie angle (toe up/toe down) of the putter head are normally fixed and cannot be adjusted or calibrated. Golfers may change their putting stance so that the golf ball is struck by the putter head either forward in the stance, in the middle of the stance, or in the back of the stance. The putter face becomes more positively lofted toward the front of the putting stance and more negatively lofted toward the rear of the putting stance. The loft is determined based upon where the golf ball is to be struck by the putter or putter head. Conventional putters do not have a loft angle adjustment mechanism.

[0008] Golfers may wish to stand closer to or further from the golf ball. As the point of contact of the putter head with the golf ball moves further from the golfer's feet, the lie angle of the shaft relative to the ground increases.

[0009] If it is desired to strike the ball with a putter head at a location closer to the golfer's feet, the lie angle is reduced and the shaft extends upwardly at a more vertical angle. With

a conventional putter, it is not possible to change the loft angle or lie angle of the putter head relative to the shaft.

[0010] The putter head is normally attached to the shaft with the blade of the putter square to the direction that the ball is to be stroked. Some golfers may want to stroke the golf ball with an open-face or a closed-face or compensate for a defect in their putting stroke. However, conventional putters do not permit adjustment of the putter head relative to the shaft and grip to provide an open or closed face.

[0011] This disclosure is directed to solving one or more of the above problems and other problems associated with conventional putter designs as summarized below.

SUMMARY

[0012] According to one aspect of this disclosure, an under the arm putter is disclosed that allows a golfer to use a long putter using a putting stance for a traditional or standard sized putter. Lodging a long putter under the armpit allows a golfer to put with a normal stance while obtaining the benefits of a long putter or belly putter preventing them from breaking their wrists while putting.

[0013] According to one aspect of the present invention, an adjustable and convertible putter is provided that may be adapted for use with any of the conventional putting styles or with an underarm putting style. The putter has a head connected to the shaft with an adjustable connector that permits the lie angle and the loft angle to both be adjusted within a wide range of angular orientations. The lie angle of the putter may be adjusted to move the toe up or down. The angular orientation of the face of the putter may be adjusted to change the loft of the putter face which allows the putter to lie on the ground in a functional manner with the appropriate loft whether the putter is positioned in the front of a player's stance, the middle of the stance, or in the back of a putter's stance. The adjustable connector also allows the putter face to be adjusted to a square, open or closed orientation.

[0014] According to another aspect of the invention, a connector assembly may be provided at an intermediate location on the shaft. A first portion of the connector assembly may be assembled to the lower portion of the shaft with a second portion of the connector assembly being attached to an upper portion of the shaft. The upper portion of the shaft may be provided in a length appropriate for an underarm putter, a belly putter, or a long putter.

[0015] According to another aspect of the invention, the shaft may be interchanged and used with different types of putter heads. For example, if a golfer wishes to convert from a two ball putter to a mallet putter, but continues to use the same shaft and putting style (belly, standard, long putter, etc.), the shaft may be easily disconnected from one putter head and reconnected to a different putter head.

[0016] According to yet another aspect of the present invention, the adjustable and convertible putter disclosed may be used as a standard putter, a belly putter, a traditional long putter, an under the arm long putter, or as a side saddle putter. With each different length and address position, the lie and loft angles may be different but with the present invention both angles may be adjusted with a single adjustment mechanism to the exact position desired by the golfer. Depending upon the position of the ball relative to the golfer's feet at address being centered, forward, or rearward, it may be necessary to adjust the loft angle (vertical face angle) of the putter head relative to the shaft. Depending on the how far the golfer chooses to stand away from the ball at address, it may be

necessary to adjust the lie angle (toe up/toe down) of the putter head relative to the shaft. The putter head may also be rotated relative to the shaft to turn the head from a square position to an open or closed position. Further, according to the present invention, the shaft may be used and combined with different heads to allow a golfer to convert from a mallet putter to a two ball putter or from one mallet putter to another, or one type of putter to another as desired.

[0017] According to a further aspect of this disclosure, a putter is disclosed that comprises a shaft with a grip provided on at least an upper end of the shaft. A head is connected to the shaft by a connector that includes a first part attached to the shaft and a second part connected to the head. The first part and the second part define a ball joint connection between the shaft and the head that are configured to connect the head to the shaft in a range of angular orientations to permit a lie angle and a loft angle of the head to be adjusted and fixed in a selected orientation relative to the shaft.

[0018] The first part of the connector may comprise a ball end including a cylindrical stub shaft adapted to be attached to a lower end of the shaft and a spherical lower portion. The second part of the connector may further comprise a receptacle that defines a partially spherical surface and a threaded locking member that may be loosened to change an angular orientation of the head relative to the shaft and tightened to fix the angular orientation of the head relative to the shaft.

[0019] The receptacle may further comprise an adapter having a plurality of fingers on an upper end that have an outer surface that form a frustum of a cone with an increasing diameter in a vertical direction. The head defines an opening that receives the adapter. A lower portion may define a threaded opening that receives the threaded locking member. The threaded locking member may be used to loosen the engagement of the fingers on the ball end by extending the adapter out of the opening. The threaded locking member may be used to tighten the engagement of the fingers by drawing the adapter into the opening.

[0020] Alternatively, the receptacle may further comprise a socket having a partially spherical surface on an upper end that is secured in an opening in the head. The socket may define a threaded hole that opens into the partially spherical surface. A threaded fastener may be received in the threaded hole with the fastener being untightened to loosen the engagement of the fastener on the ball end. The threaded fastener may be tightened to fix the ball end in place in the socket.

[0021] The opening in the head may include a shoulder that is disposed above the spherical lower portion of the ball end when the ball end is disposed in the opening in the head. The shoulder may have a lower surface that is a concave ring that conforms to a part of the spherical lower portion of the ball end. The socket may have a threaded outer surface and the opening in the head may have a threaded inner surface so that the socket is retained in the opening by the threaded outer surface engaging the threaded inner surface. A shoulder may be provided on a lower end of the socket and a countersink bore may be defined in the lower surface of the head. The socket may be screwed into the opening in the head to engage the shoulder in the countersink bore.

[0022] The shaft may further comprise a lower portion approximately 800-900 mm in length and an upper portion approximately 150-200 mm in length. A connector assembly may be provided that is adapted to secure the upper portion of the shaft to the lower portion of the shaft to adapt the shaft to

be used as a belly putter. An intermediate grip may be provided on an upper end of the lower portion.

[0023] Alternatively, the shaft may further comprise a lower portion and an extended length upper portion. A connector assembly may be provided that is adapted to secure the extended length upper portion of the shaft to the lower portion of the shaft to function as a long putter

[0024] According to another aspect of this disclosure a putter is provided that includes a putter head and a shaft connected to the putter head. The shaft has a lower portion that includes a first portion of a connector assembly and an upper portion that includes a second portion of the shaft. A first grip may be provided on the lower portion of the shaft below and adjacent to the first portion of the connector assembly. A second grip may be provided on the upper portion of the shaft in a spaced relationship relative to the second portion of the connector assembly and adjacent to an upper end of the upper portion of the shaft.

[0025] The upper portion of the shaft when used as a belly putter may have a length LB that is less than the length of the lower portion of the shaft. The upper portion of the shaft when used as a long putter may have a length LL that is greater than the length LB of the upper portion of the shaft of a belly putter.

[0026] The upper portion of the shaft may be selected from a first portion that has a length LB that is less than the length of the lower portion of the shaft, and a second upper portion of the shaft that may have a length LL, wherein the first portion is interchangeable with the second portion.

[0027] The shaft may be configured to connect the head to the shaft in a range of angular orientations to permit a lie angle and a loft angle of the head to be adjusted and fixed in a selected orientation relative to the shaft. The shaft may be connected to the putter head by a ball joint that further comprises a ball end including a cylindrical stub shaft adapted to be attached to a lower end of the shaft and a spherical lower portion. The ball joint may further comprise a receptacle on the putter head that defines a partially spherical surface and a threaded locking member that may be loosened to change an angular orientation of the head relative to the shaft and tightened to fix the angular orientation of the head relative to the shaft.

[0028] The above aspects of this disclosure will be described in greater detail below with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] FIG. 1 is a front elevation view of a standard shaft with a threaded connection assembly and an upper portion of the shaft sufficient to extend the shaft for use as an under-the-arm putter;

[0030] FIG. 2 is a fragmentary exploded perspective view of a three-part connector used to connect a shaft to a putter head;

[0031] FIG. 3 is a fragmentary cross-sectional view of the three-part connector assembly shown with the shaft connected to the putter head in a fixed angular orientation;

[0032] FIG. 4 is a fragmentary side elevation view of a shaft and putter head connected together at a selected loft angle with other loft angle orientations of the shaft relative to the putter head being shown in phantom lines;

[0033] FIG. 5 is a fragmentary perspective view of a shaft and putter head illustrating two different lie angle adjustments;

[0034] FIG. 6 is a fragmentary perspective view of a putter head and shaft illustrating the ability to adjust the angle of the face to an open angular orientation or closed angular orientation and also illustrates a threaded connector assembly for connecting the lower portion of the shaft to an interchangeable upper portion of the shaft;

[0035] FIG. 7 is a front elevation view of a standard putter;

[0036] FIG. 8 is a front perspective view of a standard putter shaft with a threaded connector assembly and an upper portion of the shaft sufficient to extend the shaft for use as a belly putter;

[0037] FIG. 9 is a front elevation view of a standard putter shaft with a threaded connector assembly and an upper portion of the shaft sufficient to extend the shaft for use as a long putter;

[0038] FIG. 10 is an exploded fragmentary perspective view of a putter head and shaft showing an alternative adjustable connector assembly; and

[0039] FIG. 11 is a cross-sectional view of the putter head and shaft connected by the adjustable connector assembly shown in FIG. 10.

DETAILED DESCRIPTION

[0040] A detailed description of the illustrated embodiments of the present invention is provided below. The disclosed embodiments are examples of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale. Some features may be exaggerated or minimized to show details of particular components. The specific structural and functional details disclosed in this application are not to be interpreted as limiting, but merely as a representative basis for teaching one skilled in the art how to practice the invention.

[0041] Referring to FIG. 1, an underarm putter 10 is shown to include a grip 12 at an upper end 14 of a shaft 16. A putter head 18 is shown at the other end of the shaft 16 with a golf ball 20 in position to be stroked with the putter head 18. A golfer 24 is shown in phantom line with the grip 12 of the underarm putter 10 disposed in the armpit 26 of the golfer 24.

[0042] Referring to FIGS. 2 and 3, a ball end 30 is provided on the shaft. A cylindrical stub shaft 32 extends from the ball end 30 and is received in the lower end of the shaft 16. An adapter is generally indicated by reference numeral 36 and defines a ball seat 38 that is a concave, partially spherical surface within the adapter 36. A plurality of fingers 40 are provided on the upper end of the adapter 36. An outer surface 42 of the fingers, in combination, form a frustum of a cone with an increasing diameter in the vertical direction. A threaded opening 44 is defined by a lower portion 46 of the adapter 36.

[0043] A receptacle 48 is defined within the putter head 18. The receptacle 48 is partially defined by a tapered wall 50 that receives the outer surface 42 of the fingers 40 when the adapter 36 is assembled to the putter head 18. A cylindrical wall 52 partially defines the receptacle 48 and receives the lower portion 46 of the adapter 36 when the adapter 36 is assembled to the putter head 18. A countersink 56 is defined in the putter head 18 and extends upwardly from the bottom of the putter head 18. A screw 58, including a threaded shaft 60 and a head 62, is inserted through the countersink 56 and into the threaded opening 44 defined by the adapter 36. The screw 58 is tightened to draw the adapter 36 into the putter head 18 until the screw 58 is tightened against a shoulder 64 created by the countersink 56. As the screw 58 is tightened, the outer

surface 42 of the fingers 40 are drawn downwardly into the receptacle 48 so that the fingers are forced into engagement with the ball end 30 by the tapered wall 50 thereby locking the shaft 16 to the putter head 18. To adjust the lie angle or loft angle of the putter head 18 relative to the shaft 16, the screw 58 is simply loosened and the shaft is repositioned at the desired angular orientation, and the screw 58 is then tightened. The putter head 18 may also be rotated relative to the shaft when the screw 58 is loosened and then may be locked into a particular open or closed orientation by tightening the screw 58.

[0044] Referring specifically to FIG. 3, the putter head 18 is shown securely attached to the shaft 16. The ball end 30 is received within the ball seat 38 and is secured to the shaft 16 by cylindrical stub shaft 32. The screw 58 is shown fully tightened against the shoulder 64 and the threaded shaft 60 of the screw 58 is fully tightened into the threaded opening 44 defined by the adapter 36. When the screw 58 is fully tightened, the fingers 42 are forced into engagement with the ball end 30 as the outer surface 42 of the fingers 40 are drawn downwardly against the tapered wall 50.

[0045] Referring to FIG. 4, the loft angle adjustment of the shaft 16 relative to the putter head 18 is illustrated by the arrows adjacent the shaft 16. The shaft 16 may be adjusted from the upright orientation shown in solid line. If the putter head 18 at address is moved back in the stance, the loft angle of the putter may be adjusted to provide a more positive loft angle to compensate for the upper end 14 of shaft 16 being in front of the putter head 18. If it is desired to position the ball more forward in the golfer's stance, the loft angle of the putter may be adjusted to a more negative loft angle to compensate for the upper end 14 of the shaft 16 being behind the putter head 18.

[0046] Referring to FIG. 5, a putter head 18 and shaft 16 are shown with the ball end 30 received in the putter head 18. The fingers 40 are shown drawn down into the putter head 18. The shaft 16 is shown in phantom lines in two positions illustrating the ability to adjust the lie angle (toe up/toe down) of the putter head relative to the shaft 16.

[0047] Referring to FIG. 6, the putter head 18 is shown attached to a lower portion 16LP of the shaft. The lower portion 16LP is connected by ball end 30 to the putter head 18. A threaded connector assembly 70 is shown as an exploded portion of the view. The connector assembly includes a first portion generally indicated by reference numeral 72. The first portion 72 includes a cylindrical stub shaft 74 that is received in lower portion 16LP of the shaft. A threaded stub shaft 76 is provided on the opposite side of a lower body portion 78 from the cylindrical stub shaft 74. A second portion 80 of the threaded connector assembly 70 includes a cylindrical stub shaft 82 on one side of an upper body portion 84. The upper body portion 84 defines a threaded bore 86 in the opposite end of the upper body portion 84 from the cylindrical stub shaft 82. The cylindrical stub shaft 82 is received in an upper portion of an underarm putter 16U to provide an underarm putter such as that shown in FIG. 1. Of course, the orientation of the threaded connector assembly 70 may be reversed with the threaded stub shaft 76 extending from the bottom 84 with the threaded bore 86 being defined in the lower body portion 7;8.

[0048] FIG. 6 also illustrates the rotary adjustability of the putter head 18 with two arcuate arrows near the lower end of the shaft 16.

[0049] Referring to FIG. 7, a standard putter is illustrated to include a putter head **18** in position for contacting a golf ball **20**. The putter head **18** is attached to a standard length shaft **16S** for use with a conventional putting style. The threaded connector assembly **70** is provided at the upper end **14** of the shaft **16S**. A grip **12** is attached to the upper end **14** of the shaft **16S**.

[0050] Referring to FIG. 8, a belly putter is illustrated that includes a putter head **18** addressing a golf ball **20**. The standard length shaft **16S** is connected to putter head **18** on its lower end. The threaded connector assembly **70** connects the standard length shaft **16S** to a belly putter portion **16B**. The belly putter embodiment includes the belly putter portion **16B** and includes the standard putter grip **13** and an upper grip **12**. Two grips are typical with a putter used in the belly putting stance. The belly putter may also be used as a side saddle putter depending upon the golfer's preference.

[0051] Referring to FIG. 9, a long putter is illustrated that includes a putter head **18** addressing a golf ball **20**. The standard length shaft **16S** is connected to putter head **18** on its lower end. The threaded connector assembly **70** connects the standard length shaft **16S** to a long putter portion **16L**. The long putter embodiment includes the standard putter grip **13** and an upper grip **12**. One or two grips are typical with a putter used in the long putting stance. The long putter may also be used as a side saddle putter depending upon the golfer's preference.

[0052] Referring to FIG. 1, an under-the-arm putter is illustrated that is somewhat longer than a conventional long putter. The standard length shaft **16S** is connected by the threaded connector assembly **70** to an under-the-arm portion **16U**. The under-the-arm putter embodiment may include two more grips **12, 13**.

[0053] Referring to FIGS. 10 and 11, an alternative adjustable putter is disclosed that has an adapter **90** including a socket **92** that has a partially spherical surface **94** on an upper end that is secured in an opening **96** in the head **98**. The socket **92** defines a threaded hole **100** that opens into the partially spherical surface **94**. A threaded fastener **102** is received in the threaded hole **100**. The fastener **102** is untightened to loosen an engagement of the fastener **102** on the ball end **30** and is tightened to fix the ball end **30** in place in the socket **92**.

[0054] The opening **96** in the head **98** includes a shoulder **104** that is disposed above a spherical portion **106** of the ball end **30** when the ball end is disposed in the opening **96** in the head **98**. The shoulder **104** has a lower surface **108** that is configured as a concave ring that conforms to a part of the spherical lower portion **106** of the ball end **30**. The socket **92** has a threaded outer surface **110** and the head **98** has a threaded inner surface **112**. When the socket is retained in the opening **96** by the threaded outer surface **110** engaging the threaded inner surface **112**, a shoulder **114** provided on a lower end **116** of the socket **92** is tightened against a countersink bore **118** defined in a lower surface **120** of the head **98**. The socket **92** is screwed into the opening in the head **98** until the shoulder **114** of the socket **92** engages the countersink bore **118**.

[0055] While exemplary embodiments are described above, it is not intended that these embodiments describe all possible forms of the disclosed apparatus and method. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the disclosure as claimed. The features of various

implementing embodiments may be combined to form further embodiments of the disclosed concepts.

What is claimed is:

1. A putter comprising:
 - a shaft;
 - a grip provided on at least an upper end of the shaft;
 - a head; and
 - a connector including a first part attached to the shaft and a second part connected to the head, wherein the first part and the second part define a ball joint connection between the shaft and the head that are configured to connect the head to the shaft in a range of angular orientations to permit a lie angle and a loft angle of the head to be adjusted and fixed in a selected orientation relative to the shaft.
2. The putter of claim 1 wherein the first part of the connector further comprises:
 - a ball end including a cylindrical stub shaft adapted to be attached to a lower end of the shaft and a spherical lower portion.
3. The putter of claim 2 wherein the second part of the connector further comprises:
 - a receptacle that defines a partially spherical surface; and
 - a threaded locking member that may be loosened to change an angular orientation of the head relative to the shaft and tightened to fix the angular orientation of the head relative to the shaft.
4. The putter of claim 3 wherein the receptacle further comprises:
 - an adapter having a plurality of fingers on an upper end that have an outer surface that form a frustum of a cone with an increasing diameter in a vertical direction, and wherein the head defines an opening that receives the adapter; and
 - a lower portion that defines a threaded opening that receives the threaded locking member; wherein the threaded locking member loosens an engagement of the fingers on the ball end by extending the adapter out of the opening, and wherein the threaded locking member tightens the engagement of the fingers by drawing the adapter into the opening.
5. The putter of claim 3 wherein the receptacle further comprises:
 - a socket having a partially spherical surface on an upper end that is secured in an opening in the head, and wherein the socket defines a threaded hole that opens into the partially spherical surface; and
 - a threaded fastener is received in the threaded hole, wherein the fastener is untightened to loosen an engagement of the fastener on the ball end, and wherein the threaded fastener is tightened to fix the ball end in place in the socket.
6. The putter of claim 5 wherein the opening in the head includes a shoulder that is disposed above the spherical lower portion of the ball end when the ball end is disposed in the opening in the head.
7. The putter of claim 6 wherein the shoulder has a lower surface that is a concave ring that conforms to a part of the spherical lower portion of the ball end.
8. The putter of claim 7 wherein the socket has a threaded outer surface in the opening in the head has a threaded inner surface, wherein the socket is retained in the opening by the threaded outer surface engaging the threaded inner surface, wherein a shoulder is provided on a lower end of the socket

and a countersink bore is defined in the lower surface of the head, and wherein the socket is screwed into the opening in the head to engage the shoulder with the countersink bore.

9. The putter of claim **1** wherein the shaft further comprises:

- a lower portion;
- an upper portion; and
- a connector assembly adapted to secure the upper portion of the shaft to the lower portion of the shaft, wherein the shaft is adapted to function as a belly putter.

10. The putter of claim **9** further comprises:
 an intermediate grip provided on an upper end of the lower portion.

11. The putter of claim **1** wherein the shaft further comprises:

- a lower portion;
- an extended length upper portion; and
- a connector assembly adapted to secure the extended length upper portion of the shaft to the lower portion of the shaft, wherein the shaft is adapted to function as a long putter.

12. The putter of claim **11** further comprises:
 an intermediate grip provided on an upper end of the lower portion.

13. A putter comprising:
 a putter head;
 a shaft connected to the putter head, wherein the shaft has a lower portion that includes a first portion of a connector assembly and an upper portion that includes a second portion of the shaft; and
 a first grip provided on the lower portion of the shaft below and adjacent to the first portion of the connector assembly, and a second grip provided on the upper portion of the shaft in a spaced relationship relative to the second

portion of the connector assembly and adjacent to an upper end of the upper portion of the shaft.

14. The putter of claim **13** wherein the upper portion of the shaft has a length *LB* that is less than the length of the lower portion of the shaft.

15. The putter of claim **13** wherein the upper portion of the shaft has a length *LL* that is greater than the length of the lower portion of the shaft.

16. The putter of claim **13** wherein the upper portion of the shaft may be selected from a first portion that has a length *LB* that is less than the length of the lower portion of the shaft, and a second upper portion of the shaft that has a length *LL*, and wherein the first portion is interchangeable with the second portion.

17. The putter of claim **13** wherein the shaft is configured to connect the head to the shaft in a range of angular orientations to permit a lie angle and a loft angle of the head to be adjusted and fixed in a selected orientation relative to the shaft.

18. The putter of claim **13** wherein the shaft is connected to the putter head by a ball joint that further comprises:

- a ball end including a cylindrical stub shaft adapted to be attached to a lower end of the shaft and a spherical lower portion.

19. The putter of claim **18** wherein the ball joint further comprises:

- a receptacle on the putter head that defines a partially spherical surface; and
- a threaded locking member that may be loosened to change an angular orientation of the head relative to the shaft and tightened to fix the angular orientation of the head relative to the shaft.

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