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(54) **Golf putter**

Golfputter

Putter de golf

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Description

[0001] This invention relates to a golf club. More particularly the invention is concerned with the provision of a novel connection between the head of a golf club and the shaft. In prior art golf clubs as shown in figure 1 a golf club 1 comprises a head 2 connected to a shaft 3. the head 2 has a striking face 4 with a so called sweet-spot 5 which is usually arranged to occur at the geometrical centre of area of the striking face 4 as indicated by the crossed lines. Ideally impact with a golf ball is sought to take place at the sweet-spot 5. A problem with this prior art arrangement is that the shaft 3 is displaced somewhat from the impact area and is fixed directly to the head 2. As a consequence of this some of the energy of impact is dissipated within the head thus lessening the amount of impact energy which can be transmitted up the shaft to the player's hands so that in one sense the amount of energy available to define "feel" is reduced.

[0002] A number of arrangements have been proposed which aim to assist the golfer in striking the golf ball correctly. For example, US5,090,698 describes a golf putter in which the sweet spot is effectively extended over much of the striking surface. However, the striking face forms part of the golf club head itself and therefore a significant proportion of the impact energy is dissipated within the head with the disadvantageous effects described above.

[0003] US4,411,430 discloses a golf putter having an eccentrically weighted portion inside the golf club head which may be rotated to shift the axial centre of mass of the head. This enables the golfer to correct manufacturing variations and to correct errors in the putting stroke. However, the striking surface of the putter effectively forms an integral part of the golf club head and similarly can result in reduced "feel" sensed by the player.

[0004] According to the present invention there is provided, a golf club having a head including a striking face with a sweet spot, the head comprising an outer shell member defining a cavity, an inner insert member located within the cavity spaced from the outer shell member and defining the sweet spot, and a shaft connection fixed to the inner insert member through the outer shell member, characterized in that the inner insert member is resiliently supported and resiliently fixed within the cavity such that a clearance space exists between the inner insert member and the outer shell member.

[0005] The present invention will now be described by way of example only and with reference to the accompanying drawings wherein:

Figure 1 is a prior art golf club and connection.

Figure 2 is a part sectional elevation of a golf putter in accordance with the present invention.

Figure 3 is a part elevational view looking on arrow

"A" of figure 2

Figure 4 is a perspective view of an insert used in the practice of the invention.

Figure 5 is a perspective view of a putter head and shaft connection in accordance with the present invention.

[0006] In figure 2 there is shown a golf putter 10 in accordance with the present invention. Golf putter 10 comprises a generally T-shaped head 11 connected to a shaft 12 by means of a hosel member 13. Hosel member 13 may be hollow. A shaft connection may comprise the hosel member 13 or the hosel member 13 may be dispensed with and the shaft connection may comprise a shaft 14 connected directly to the head 11. The head 11 comprises an outer shell member 15 which defines a cavity 16 within the head 11. An important part of the present invention is the use of a cylindrical inner insert member 17 located within cavity 16 of head 11. Insert member 17 is made of bronze material and defines a rear cavity 18. The bronze material is selected to be a soft ductile material to facilitate the transmission of shock. A sweet spot 19 of the head 11 is arranged to be at the centre of the circular face area of insert 17 as indicated by the crossed lines as best seen in figure 4. An aperture 20 is formed in insert 17 by drilling and reaming to receive and ensure a proper fit with either hosel 13 or shaft 14. As seen in figure 2 hosel member 13 stops short of the end of the aperture 20 so that it does not contact outer shell member 15. It is believed this arrangement enhances the transmission of impact energy to the putter shaft as feel. Cavity 18 in combination with the remaining part of cavity 16 defines a void 21 in head 11. Void 21 is believed to increase the resonance factor of head 11. Insert 17 is supported and fixed within cavity 16 by means of Neoprene resilient O-rings 22, 23 fitted to semi-circular grooves 24, 25 formed around the circular periphery of insert 17. A small clearance exists between insert 17 and a shoulder 26 formed within outer shell member 15. Also as best seen in figure 2 the O-rings 22,23 space the insert 17 from outer shell member 15 so that a small clearance 31 is formed which in a sense insulates insert 17 from outer shell member 15. Stabilising or inertia weights 27 are let into the sides 28 of the head 11 to minimise the effect of off-centre hits. A slot 29, see figure 5, assists in aiming the striking face 30 of the putter head 11. Outer shell member 15 and hosel member 13 are made of aircraft quality high strength aluminium and when shaft 12,14 comprises a substantially large diameter shaft the shaft will be made of carbon fibre material. In addition to resiliently fixing insert 17 within cavity 16 the O-rings act as seals to prevent dirt and moisture from entering void 21 through clearance 31. Shaft 14 or hosel member 13 enters the aperture 20 in insert 17 through a hole 29 drilled in outer shell member 15. As can be appreciated from figure 3

because insert 17 is insulated from outer shell member 15 by the resilient O-rings any impact on insert 17 is transferred more or less directly to shaft 14 or hosel 13 with less impact energy being dissipated within head 11. Consequently a golf club, for example a putter as shown in figure 2 may have an increased "feel factor" due to the increased energy being transmitted up the shaft 12, 14. It has been found in practice that the void 21 also enhances the feel factor. The present invention may be used with so called standard shafts. However, the invention can be most advantageously used in a putter with a substantially large diameter (between 25 and 45mm), thin walled, parallel shaft to enhance the "feel factor". The present invention may be used in golf clubs other than putters but in that case due care must be taken with the design because of the higher forces that may be involved.

Claims

1. A golf club (10) having a head (11) including a striking face (30) with a sweet spot (19), the head comprising an outer shell member (15) defining a cavity (16), an inner insert member (17) located within the cavity (16) spaced from the outer shell member (15) and defining the sweet spot (19), and a shaft connection (12,14) fixed to the inner insert member (17) through the outer shell member (15), **characterized in that** the inner insert member (17) is resiliently supported and resiliently fixed within the cavity (16) such that a clearance space (31) exists between the inner insert member (17) and the outer shell member (15).
2. A golf club (10) according to claim 1, wherein the inner insert member (17) is supported and resiliently fixed by resilient O-rings (22,23).
3. A golf club (10) according to claim 2, wherein the resilient O-rings (22,23) comprise the material Neoprene.
4. A golf club according to claim 2 or claim 3, wherein the inner insert member (17) comprises a rear cavity (18) which, together with at least a portion of the cavity (16), forms a void (21) within the head (11), the void (21) being sealed by the O-rings (22,23).
5. A golf club (10) according to any of claims 2 to 4, wherein the inner insert member (17) further comprises grooves (24,25) formed around its circumference to receive the resilient O-rings (22,23).
6. A golf club (10) according to any of the preceding claims, wherein the shaft connection (12,14) fits within an aperture (20) formed in the inner insert member (17) and stops short of the end of the ap-

erture (20) so that it does not contact the outer shell member (15).

7. A golf club (10) according to any of the preceding claims, wherein the shaft connection (12,14) comprises a hosel member (13) fitted to the insert.
8. A golf club (10) according to claim 7, wherein the hosel member (13) is hollow.
9. A golf club (10) according to claim 7 or claim 8, wherein the shaft connection (12,14) further comprises a shaft (14) fitted to the hosel member (13).
10. A golf club according to any of claims 1 to 6, wherein the shaft connection (12,14) comprises a shaft (14).
11. A golf club (10) according to claim 9 or claim 10, wherein the shaft (14) has a diameter of between 25 and 45mm.
12. A golf club (10) according to any of the preceding claims, wherein a shoulder (26) is formed within the cavity (16) of outer shell member (15), and a clearance space exists between the inner insert member (17) and the shoulder (26).
13. A golf club (10) according to any of claims 7 to 9 or 11 to 12, wherein the outer shell member (15) and the hosel member (13) are made of high strength aircraft quality aluminum.
14. A golf club (10) according to any of the preceding claims, wherein the inner insert member (17) is made of a soft ductile bronze material.
15. A golf club (10) according to any of the preceding claims, the club (10) comprising a putter.

Patentansprüche

1. Golfschläger (10) mit einem Kopf (11) mit einer Schlagfläche (30) mit einem Sweetspot (19), wobei der Kopf einen Hohlraum (16) definierendes äußeres Schalelement (15), ein inneres Einselement (17), das im Hohlraum (16) in einem Abstand vom äußeren Schalelement (15) angeordnet ist und den Sweetspot (19) definiert, und eine Schaftverbindung (12, 14), die durch das äußere Schalelement (15) mit dem inneren Einselement (17) fest verbunden ist, aufweist, **dadurch gekennzeichnet, dass** das innere Einselement (17) im Hohlraum (16) flexibel gelagert und flexibel gehalten ist, so dass ein Spielraum (31) zwischen dem inneren Einselement und dem äußeren Schalelement (15) besteht.

2. Golfschläger (10) nach Anspruch 1, bei dem das innere Einsetzelement (17) durch flexible O-Ringe (22, 23) gelagert und flexibel befestigt ist.
3. Golfschläger (10) nach Anspruch 2, bei dem die flexiblen O-Ringe (22, 23) das Material Neopren umfassen.
4. Golfschläger (10) nach Anspruch 2 oder Anspruch 3, bei dem das innere Einsetzelement (17) einen hinteren Hohlraum (18) umfasst, der zusammen mit mindestens einem Teil des Hohlraums (16) einen Hohlraum (21) im Kopf (11) bildet, wobei der Hohlraum (21) durch die O-Ringe (22, 23) abgedichtet wird.
5. Golfschläger (10) nach einem der Ansprüche 2 bis 4, bei dem das innere Einsetzelement (17) weiter Nuten (24, 25), die um seinen Außenumfang herumlaufend ausgebildet sind, umfasst, um die flexiblen O-Ringe (22, 23) aufzunehmen.
6. Golfschläger (10) nach einem der vorhergehenden Ansprüche, bei dem die Schaftverbindung (12, 14) in eine Öffnung (20) passt, die im inneren Einsetzelement (17) ausgebildet ist, und nicht ganz bis zum Ende der Öffnung (20) reicht, so dass sie mit dem äußeren Schalenelement (15) nicht in Kontakt kommt.
7. Golfschläger (10) nach einem der vorhergehenden Ansprüche, bei dem die Schaftverbindung (12, 14) ein in den Einsatz eingepasstes Verbindungsstück (13) umfasst.
8. Golfschläger (10) nach Anspruch 7, bei dem das Verbindungsstück (13) hohl ist.
9. Golfschläger (10) nach Anspruch 7 oder Anspruch 8, bei dem die Schaftverbindung (12, 14) weiter einen an das Verbindungsstück (13) angepassten Schaft (14) aufweist.
10. Golfschläger (10) nach einem der Ansprüche 1 bis 6, bei dem die Schaftverbindung (12, 14) einen Schaft (14) aufweist.
11. Golfschläger (10) nach Anspruch 9 oder Anspruch 10, bei dem der Schaft (14) einen Durchmesser zwischen 25 und 45 mm hat.
12. Golfschläger (10) nach einem der vorhergehenden Ansprüche, bei dem eine Schulter (26) im Hohlraum (16) des äußeren Schalenelements (15) ausgebildet ist und ein Spielraum zwischen dem inneren Einsetzelement (17) und der Schulter (26) besteht.
13. Golfschläger (10) nach einem der Ansprüche 7 bis

9 oder 11 bis 12, bei dem das äußere Schalenelement (15) und das Verbindungsstück (13) aus einem hochfesten Aluminium von Luftfahrtqualität hergestellt ist.

14. Golfschläger (10) nach einem der vorhergehenden Ansprüche, bei dem das innere Einsetzelement (17) aus einem weichen elastischen Bronzematerial hergestellt ist.
15. Golfschläger (10) nach einem der vorhergehenden Ansprüche, wobei der Schläger (10) einen Putter umfasst.

Revendications

1. Club de golf (10) comprenant une tête (11) présentant une face de frappe (30) comportant un point idéal (19), la tête comprenant un élément de coque extérieure (15) définissant une cavité (16), un élément d'insert intérieur (17) situé à l'intérieur de la cavité (16) espacé de l'élément de coque extérieure (15) et définissant le point idéal (19), et un raccord de manche (12, 14) fixé à l'élément d'insert intérieur (17) à travers l'élément de coque extérieure (15), **caractérisé en ce que** l'élément d'insert intérieur (17) est supporté d'une façon élastique et est fixé d'une façon élastique à l'intérieur de la cavité (16), de telle sorte qu'un espacement (31) est formé entre l'élément d'insert intérieur (17) et l'élément de coque extérieure (15).
2. Club de golf (10) selon la revendication 1, dans lequel l'élément d'insert intérieur (17) est supporté et fixé d'une façon élastique à l'aide de joints toriques élastiques (22, 23).
3. Club de golf (10) selon la revendication 2, dans lequel les joints toriques élastiques (22, 23) comprennent le matériau Néoprène.
4. Club de golf selon la revendication 2 ou la revendication 3, dans lequel l'élément d'insert intérieur (17) comprend une cavité arrière (18) qui, de concert avec au moins une partie de la cavité (16), forme un vide (21) à l'intérieur de la tête (11), le vide (21) étant rendu étanche par les joints toriques (22, 23).
5. Club de golf (10) selon l'une quelconque des revendications 2 à 4, dans lequel l'élément d'insert intérieur (17) comporte en outre des rainures (24, 25) formées autour de sa circonférence pour recevoir les joints toriques élastiques (22, 23).
6. Club de golf (10) selon l'une quelconque des revendications précédentes, dans lequel le raccord de manche (12, 14) s'agence à l'intérieur d'une ouver-

ture (20) pratiquée dans l'élément d'insert intérieur (17) et s'arrête tout près de l'extrémité de l'ouverture (20) de telle sorte qu'il n'entre pas en contact avec l'élément de coque extérieure (15).

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7. Club de golf (10) selon l'une quelconque des revendications précédentes, dans lequel le raccord de manche (12, 14) comprend un élément de col (13) fixé sur l'insert.

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8. Club de golf (10) selon la revendication 7, dans lequel l'élément de col (13) est creux.

9. Club de golf (10) selon la revendication 7 ou la revendication 8, dans lequel le raccord de manche (12, 14) comprend en outre un manche (14) fixé sur l'élément de col (13).

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10. Club de golf selon l'une quelconque des revendications 1 à 6, dans lequel le raccord de manche (12, 14) comprend un manche (14).

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11. Club de golf (10) selon la revendication 9 ou la revendication 10, dans lequel le manche (14) a un diamètre compris entre 25 mm et 45 mm.

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12. Club de golf (10) selon l'une quelconque des revendications précédentes, dans lequel un épaulement (26) est formé à l'intérieur de la cavité (16) de l'élément de coque extérieure (15), et un espacement est formé entre l'élément d'insert intérieur (17) et l'épaulement (26).

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13. Club de golf (10) selon l'une quelconque des revendications 7 à 9 ou 11 à 12, dans lequel l'élément de coque extérieure (15) et l'élément de col (13) sont constitués d'aluminium à haute résistance de qualité pour avions.

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14. Club de golf (10) selon l'une quelconque des revendications précédentes, dans lequel l'élément d'insert intérieur (17) est constitué d'un matériau ductile tendre à base de bronze.

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15. Club de golf (10) selon l'une quelconque des revendications précédentes, le club (10) consistant en un putter.

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