A connecting structure is provided for a striking plate and a body of a golf club head. The body includes an opening in a front side thereof. The opening is delimited by a perimeter end wall, and a first snapping projection is formed on the perimeter end wall. The striking plate includes a perimeter wall projecting from a face thereof. A second snapping projection extends along a distal end of the perimeter wall of the striking plate. The first snapping projection and the second snapping projection engage with each other for positioning the body and the striking plate.
CONNECTING STRUCTURE FOR STRIKING PLATE AND BODY OF GOLF CLUB HEAD

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a connecting structure for a golf club head. In particular, the present invention relates to a connecting structure for a striking plate and a body of a golf club head.

[0003] 2. Description of Related Art

[0004] Taiwan Patent Publication No. 327606 discloses a method for bonding a striking plate to a golf club head body. The golf club head body is made of metal and includes an opening in a face thereof. The opening includes a shoulder on which a welding material is placed. The striking plate is inserted into the opening and presses against a protruded portion of an inner edge of the shoulder, thereby filling the welding material into the gap between the striking plate, the shoulder, and the protruded portion. The welding material is made of metal powder and has a melting point lower than those of the golf club head body and the striking plate. The golf club head body/striking plate is placed into a vacuum furnace or a high-temperature furnace protected by inert gas and heated to a temperature higher than the melting point of the welding material. The molten welding material fills the tiny gap between the striking plate and the golf club head body by capillary action. After cooling, a reliable golf club head body with firm bonding and without weld mark is obtained.

[0005] Taiwan Utility Model Publication No. 421057 discloses a connecting structure for a body and a striking plate of a golf club head. The body includes an opening in a front side thereof. The striking plate is similar to the opening in shape yet slightly greater than the opening in size. The striking plate covers the opening. An annular protrusion is formed on an outer edge of the opening of the body, and an annular groove is defined in a perimeter of a rear side of the striking plate for receiving the annular protrusion. A brazing layer is formed between the joint area between the body and the striking plate. The welding layer is formed as a result of solidification of molten brazing material after cooling, thereby securely brazing the body and the striking plate together.

[0006] Preferably, the connecting structure further comprises a bonding layer formed between the first snapping projection of the body and the second snapping projection of the striking plate. The bonding layer is formed by one of brazing and adhesion.

[0007] Taiwan Patent Publication No. 590028 discloses a wooden club head comprising a body and a striking plate. The striking plate includes an annular wall projecting from a side thereof, providing a U-shaped structure in section to improve elastic deformability. The body includes an annular groove for engaging with an annular protrusion of the striking plate. The body and the striking plate are bonded together by brazing.

[0008] In both of Taiwan Utility Model Publication No. 421057 and Taiwan Patent Publication No. 590028, a larger filling space with a larger contact area exists between the annular groove and the annular protrusion, providing a larger bonding area for brazing. However, the annular protrusion and the annular groove are bonded with each other by the brazing layer that could not withstand long-term swing. A cannon test (a golf ball with a standard weight hit the striking plate of the club head at a velocity of 50 m/sec) showed that the striking plate disengaged from the body after being shot 100 times. Improvement in the connecting structure for the striking plate and the golf club head body is required.

OBJECTS OF THE INVENTION

[0009] An object of the present invention is to provide a connecting structure for a striking plate and a body of a golf club head with improved assembly accuracy.

[0010] Another object of the present invention is to provide a connecting structure for a striking plate and a body of a golf club head with improved bonding strength.

[0011] A further object of the present invention is to provide a connecting structure for a striking plate and a body of a golf club head with improved bonding reliability.

[0012] Still another object of the present invention is to provide a connecting structure for a striking plate and a body of a golf club head to prolong the life of the golf club head.

SUMMARY OF THE INVENTION

[0013] In accordance with the present invention, a connecting structure is provided for a striking plate and a body of a golf club head. The body includes an opening in a front side thereof. The opening is delimited by a perimeter end wall, and a first snapping projection is formed on the perimeter end wall. The striking plate includes a perimeter wall projecting from a face thereof. A second snapping projection extends along a distal end of the perimeter wall of the striking plate. The first snapping projection and the second snapping projection engage with each other for positioning the body and the striking plate.

[0014] Preferably, the connecting structure further comprises a bonding layer formed between the first snapping projection of the body and the second snapping projection of the striking plate. The bonding layer is formed by one of brazing and adhesion.

[0015] Preferably, the first snapping projection of the body comprises a slant perimeter face, and the second snapping projection of the striking plate includes a slant perimeter face for engaging with the slant perimeter face of the first snapping projection.

[0016] In an embodiment of the invention, the first snapping projection includes a perimeter groove, and the second snapping projection projects inward from the distal end of the perimeter wall of the striking plate and is engaged in the perimeter groove of the first snapping projection.

[0017] Preferably, the first snapping projection extends along a portion of the perimeter end wall delimiting the opening of the body, leaving a shoulder. In an embodiment of the invention, the first snapping projection extends along an outer portion of the perimeter end wall delimiting the opening of the body, with the shoulder of the body located inside the first snapping projection. In another embodiment
of the invention, the first snapping projection extends along an inner portion of the perimeter end wall delimiting the opening of the body, with the shoulder of the body located outside the first snapping projection. Preferably, the first snapping projection comprises a slant perimeter face inclining toward the shoulder.

Preferably, the second snapping projection extends along a portion of an end face of the perimeter wall of the striking plate, leaving a shoulder. In an embodiment of the invention, the second snapping projection extends along an outer portion of the end face of the perimeter wall of the striking plate, with the shoulder of the striking plate located inside the second snapping projection. In another embodiment of the invention, the second snapping projection extends along an inner portion of the end face of the perimeter wall of the striking plate, with the shoulder of the striking plate located outside the second snapping projection. Preferably, the second snapping projection comprises a slant perimeter face inclining toward the shoulder of the striking plate.

Preferably, the body further comprises a hosel mounted to a side of the body and a wall portion located on the front side of the body and adjacent to the hosel and the perimeter end wall delimiting the opening, and the striking plate comprises an opening facing the wall portion of the body.

Other objects, advantages and novel features of this invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a first embodiment of a golf club head in accordance with the present invention;

FIG. 2 is an exploded sectional view of the golf club head in FIG. 1;

FIG. 2a is an enlarged view of a circled portion in FIG. 2;

FIG. 3 is a sectional view of the golf club head in FIG. 2 after assembly;

FIG. 3a is an enlarged view of a circled portion in FIG. 3;

FIG. 4 is an exploded perspective view of a second embodiment of the golf club head in accordance with the present invention;

FIG. 5 is an exploded sectional view of the golf club head in FIG. 4;

FIG. 5a is an enlarged view of a circled portion in FIG. 5;

FIG. 6 is a sectional view of the golf club head in FIG. 5 after assembly;

FIG. 6a is an enlarged view of a circled portion in FIG. 6;

FIG. 7 is an exploded sectional view of a third embodiment of the golf club head in accordance with the present invention;

FIG. 8 is a sectional view of the golf club head in FIG. 7 after assembly;

FIG. 8a is an enlarged view of a circled portion in FIG. 8.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2, a first embodiment of a golf club head in accordance with the present invention comprises a body 1 and a striking plate 2. The body 1 may be of iron club type, wooden club type, or putter type. In the illustrated embodiment, the body 1 is of iron club type, detailed structure of which is not described to avoid redundancy.

Still referring to FIGS. 1 and 2, the body 1 comprises a hosel 11, an opening 12 delimited by a perimeter end wall facing a front of the body 1, a wall portion 13, and a first snapping projection 14. The hosel 11 is integrally formed with or welded to a side of the body 1. The opening 12 is formed in a front side of the body 1. A space for the outward elastic deformation of the striking plate 2 is thus provided behind the opening 12. The wall portion 13 is located on the front side of the body 1 adjacent to the hosel 12 and the perimeter end wall delimiting the opening 12.

The first snapping projection 14 extends along the perimeter end wall of the opening 12, leaving a first shoulder 15. In the illustrated embodiment, the first snapping projection 14 extends along an outer portion of the perimeter end wall of the opening 12 and the first shoulder 15 is located inside the first snapping projection 14, with the first snapping projection 14 including a slant perimeter face 140 inclining toward the first shoulder 15. A brazing material or adhesive (not shown) may be applied to the first snapping projection 14 and the first shoulder 15 according to the need of the manufacturing process.

Referring to FIGS. 1, 2, and 2a, in the illustrated embodiment, the striking plate 2 includes a perimeter wall 21 projecting from a face thereof and extending along a perimeter of the striking plate 2, leaving an opening 22 (FIG. 1) in a side of the face of the striking plate 2 and between two distal ends of the perimeter wall 21. The opening 22 is adjacent to the hosel 11 when the striking plate 2 is bonded to the body 1. The striking plate 2 is substantially U-shaped or L-shaped in section due to provision of the perimeter wall 21 and the opening 22, improving the elastic deformability of the striking plate 2.

A second snapping projection 23 extends along an end face of the perimeter wall 21, leaving a second shoulder 24. In the illustrated embodiment, the second snapping projection 23 extends along an inner portion of the end face of the perimeter wall 21 and the second shoulder 24 is located outside the second snapping projection 23, with the second snapping projection 23 including a slant perimeter face 230 inclining toward the second shoulder 24. A brazing material or adhesive (not shown) may be applied to the second snapping projection 23 and the second shoulder 24 according to the need of the manufacturing process. Further, as illustrated in FIG. 2a, the second snapping projection 23 may include a chamfered face 231 at a distal edge thereof to improve assembling convenience.

Referring to FIGS. 3 and 3a, before assembly, a brazing material (or adhesive) is applied to the first snapping
projection 14 and the first shoulder 15 (or the second snapping projection 23 and the second shoulder 24). Further, a brazing material (or adhesive) is applied to the wall delimiting the opening 22 and the wall portion 13.

[0040] In assembly, the opening 22, the second snapping projection 23, and the second shoulder 24 of the striking plate 2 are respectively aligned with the wall portion 13, the first snapping projection 14 and the first shoulder 15 of the body 1. The chamfered face 231 allows the second snapping projection 23 of the striking plate 2 to smoothly slide along into a space defined by the first snapping projection 14 and the first shoulder 15 such that the slant perimeter face 140 of the first snapping projection 14 and the slant perimeter face 230 of the second snapping projection 23 engage with each other. After snapping, the snapping engagement between the first snapping projection 14 and the second snapping projection 23 maintain accurate positioning in the pre-assembly procedure. Next, heating and brazing are carried out to melt the brazing material that forms a bonding layer 3 after cooling, thereby bonding the body 1 and the striking plate 2 by brazing. Alternatively, the bonding layer 3 is formed by adhesive after solidification. The adhesive may be epoxy, ultraviolet (UV) light-sensitive adhesive, instant adhesive, or anaerobic adhesive.

[0041] Other methods using a brazing material can be used. For example, after mutual snapping between the body 1 and the striking plate 2, an appropriate amount of a paste-like brazing material can be applied to the joint surfaces of the body 1 and the striking plate 2 and then heated. The molten brazing material fills the gap between the body 1 and the striking plate 2 under the capillary action. Further, a brazing material carrier structure in the form of at least one wing (not shown) may be provided on at least one of the body 1 and the striking plate 2. After mutual snapping between the body 1 and the striking plate 2, solid brazing material is placed on the wing and then heated. The molten brazing material fills the gap between the body 1 and the striking plate 2 under the capillary action. The wing is then removed by cutting.

[0042] After brazing (or adhering), due to the mutual snapping and brazing (or adhesion) between the body 1 and the striking plate 2, the bonding reliability between the body 1 and the striking plate 2 is improved, effectively avoiding cracking in the joint area therebetween, thereby prolonging the life of the golf club head.

[0043] FIGS. 4, 5a, 6, and 6a illustrate a third embodiment of the golf club head modified from the first embodiment. In this embodiment, the first snapping projection 14 extends along an inner portion of the perimeter end wall of the opening 12 and the first shoulder 15 is located outside the first snapping projection 14, with the first snapping projection 14 including a slant perimeter face 140 inclining toward the first shoulder 15. Further, the second snapping projection 23 extends along an outer portion of the end face of the perimeter wall 21 and the second shoulder 24 is located inside the second snapping projection 23 with the second snapping projection 23 including a slant perimeter face 230 inclining toward the second shoulder 24. Further, as illustrated in FIG. 5a, the first snapping projection 14 includes a chamfered face 141 at a distal edge thereof to improve assembling convenience.

[0044] After assembling and brazing (or adhering), an engaging layer 3 is formed between the second snapping projection 23, the second shoulder 24, the first projection 14, and the first shoulder 15. Due to the mutual snapping and brazing (or adhesion) between the body 1 and the striking plate 2, the bonding strength and bonding reliability between the body 1 and the striking plate 2 are improved.

[0045] FIGS. 7, 8, and 8a illustrate a third embodiment of the golf club head modified from the second embodiment. In this embodiment, the second shoulder 24 of the striking plate 2 is omitted. Instead, the perimeter wall 21 of the striking plate 2 includes an annular projection projecting inward from the distal end of the perimeter wall 21 to form the second snapping projection 23. Further, the first snapping projection 14 includes a perimeter groove 142 for engaging with the second snapping projection 23. The first snapping projection 14 includes a perimeter face for guiding the second snapping projection 23 into the perimeter groove 142. After assembly and brazing (or adhesion), an engaging layer 3 is formed between the second snapping projection 23, the first snapping projection 14, and the first shoulder 15. The bonding strength and bonding reliability between the striking plate 2 and the body 1 are improved.

[0046] While the principles of this invention have been disclosed in connection with specific embodiments, it should be understood by those skilled in the art that these descriptions are not intended to limit the scope of the invention, and that any modification and variation without departing the spirit of the invention is intended to be covered by the scope of this invention defined only by the appended claims.

What is claimed is:

1. A connecting structure for a striking plate and a body of a golf club head, comprising:

   a body including an opening in a front side thereof, the opening being delimited by a perimeter end wall, a first snapping projection being formed on the perimeter end wall; and

   a striking plate including a perimeter wall projecting from a face thereof, a second snapping projection extending along a distal end of the perimeter wall of the striking plate, the first snapping projection and the second snapping projection engaging with each other for positioning the body and the striking plate.

2. The connecting structure as claimed in claim 1 wherein the connecting structure further comprises a bonding layer formed between the first snapping projection of the body and the second snapping projection of the striking plate.

3. The connecting structure as claimed in claim 1 wherein the bonding layer is formed by one of brazing and adhesion.

4. The connecting structure as claimed in claim 1 wherein the first snapping projection of the body comprises a slant perimeter face, and wherein the second snapping projection of the striking plate includes a slant perimeter face for engaging with the slant perimeter face of the first snapping projection.

5. The connecting structure as claimed in claim 1 wherein the first snapping projection includes a perimeter groove, and wherein the second snapping projection projects inward from the distal end of the perimeter wall of the striking plate and is engaged in the perimeter groove of the first snapping projection.

6. The connecting structure as claimed in claim 1 wherein the first snapping projection extends along a portion of the
perimeter end wall delimiting the opening of the body on which further defines a shoulder.

7. The connecting structure as claimed in claim 6 wherein the first snapping projection extends along an outer portion of the perimeter end wall delimiting the opening of the body, with the shoulder of the body located inside the first snapping projection.

8. The connecting structure as claimed in claim 7 wherein the first snapping projection comprises a slant perimeter face inclining toward the shoulder.

9. The connecting structure as claimed in claim 6 wherein the first snapping projection extends along an inner portion of the perimeter end wall delimiting the opening of the body, with the shoulder of the body located outside the first snapping projection.

10. The connecting structure as claimed in claim 9 wherein the first snapping projection comprises a slant perimeter face inclining toward the shoulder.

11. The connecting structure as claimed in claim 1 wherein the second snapping projection extends along a portion of an end face of the perimeter wall of the striking plate, leaving a shoulder.

12. The connecting structure as claimed in claim 11 wherein the second snapping projection extends along an inner portion of the end face of the perimeter wall of the striking plate, with the shoulder of the striking plate located inside the second snapping projection.

13. The connecting structure as claimed in claim 9 wherein the second snapping projection extends along an outer portion of the end face of the perimeter wall of the striking plate, with the shoulder of the striking plate located inside the second snapping projection.

14. The connecting structure as claimed in claim 11 wherein the second snapping projection extends along an inner portion of the end face of the perimeter wall of the striking plate, with the shoulder of the striking plate located outside the second snapping projection.

15. The connecting structure as claimed in claim 7 wherein the second snapping projection extends along an inner portion of the end face of the perimeter wall of the striking plate, with the shoulder of the striking plate located outside the second snapping projection.

16. The connecting structure as claimed in claim 12 wherein the second snapping projection comprises a slant perimeter face inclining toward the shoulder of the striking plate.

17. The connecting structure as claimed in claim 13 wherein the second snapping projection comprises a slant perimeter face inclining toward the shoulder of the striking plate.

18. The connecting structure as claimed in claim 14 wherein the second snapping projection comprises a slant perimeter face inclining toward the shoulder of the striking plate.

19. The connecting structure as claimed in claim 15 wherein the second snapping projection comprises a slant perimeter face inclining toward the shoulder of the striking plate.

20. The connecting structure as claimed in claim 1 wherein the body further comprises a hosel mounted to a side of the body and a wall portion located on the front side of the body and adjacent to the hosel and the perimeter end wall delimiting the opening, and wherein the striking plate comprises an opening facing the wall portion of the body.

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