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(54) **GOLF CLUB HEAD**

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(57) **ABSTRACT**

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Disclosed is a golf club head including a variation part, which is easily flexible, formed at a striking surface of a head, and capable of increasing repulsive power caused by an elastic deformation rate of the striking surface upon striking a ball to improve a flying distance, and strengthening an elastic recovering force of corner parts formed by the variation part to further enhance stability in a ball-flying direction and a ball spin function.

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Aug. 28, 2010 (KR) ..... 10-2010-0083734

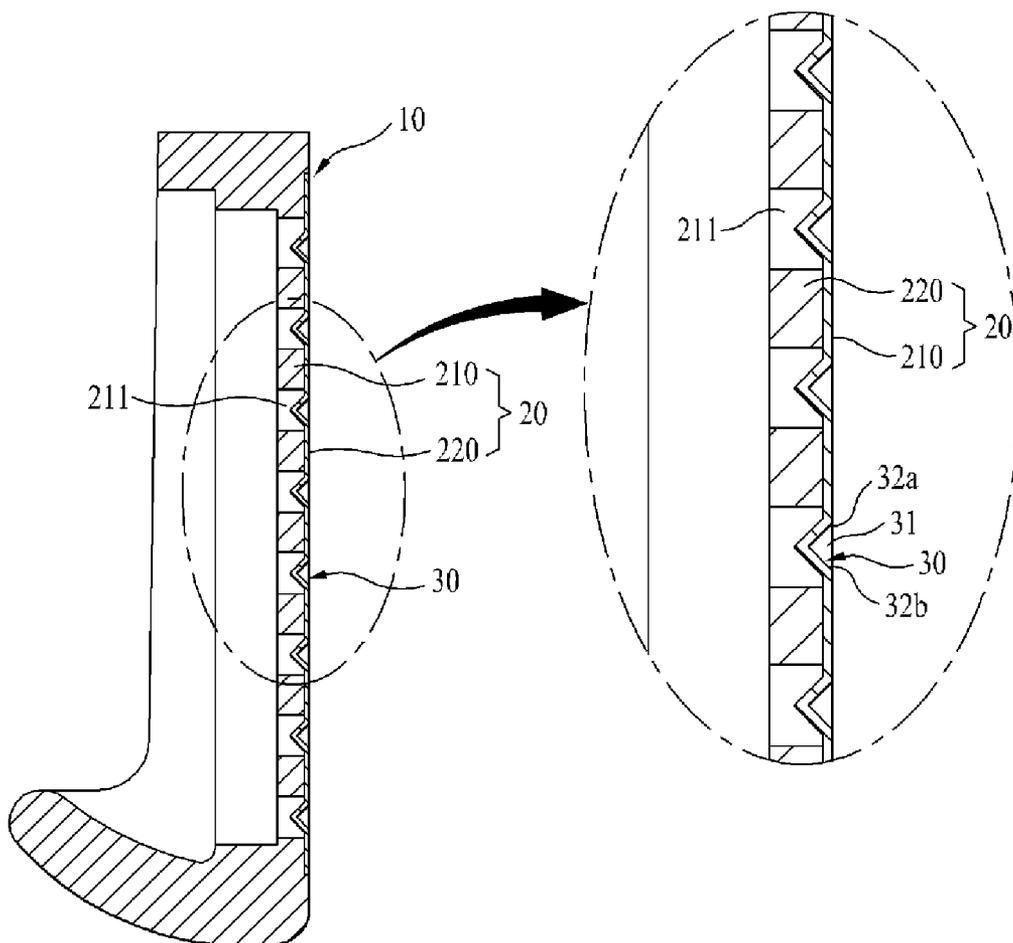


FIG. 1

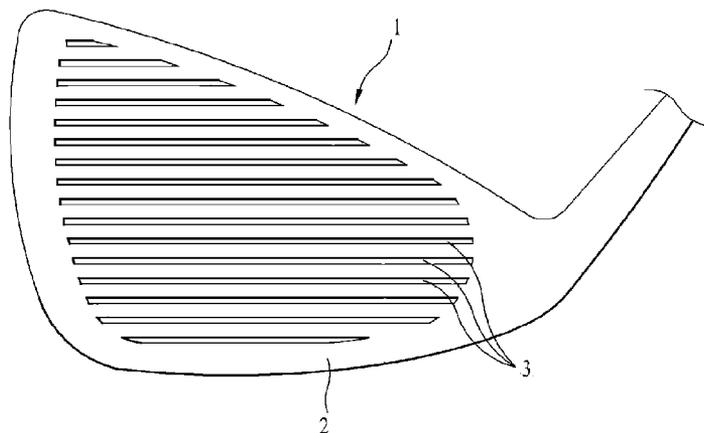


FIG. 2

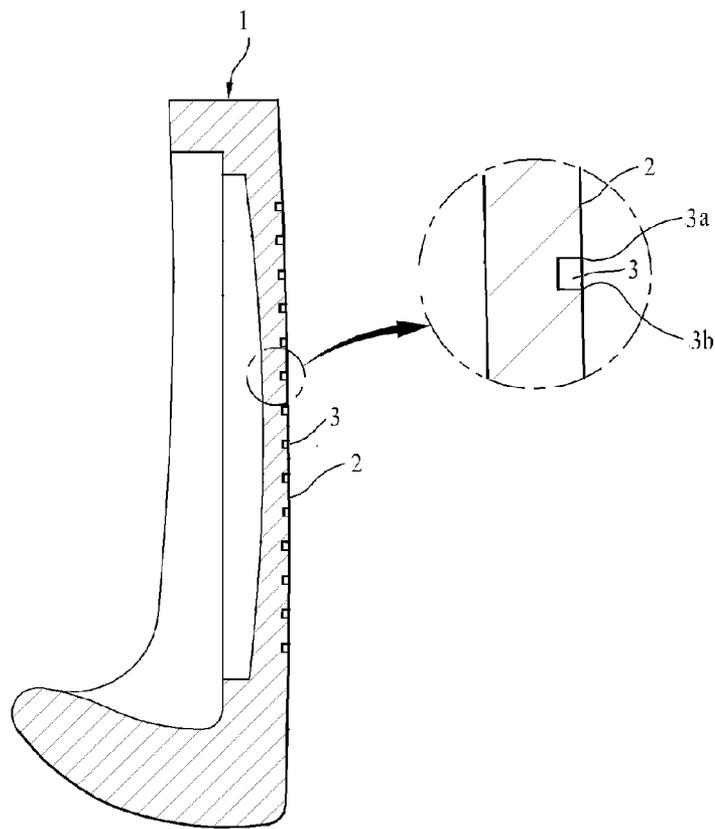


FIG. 3

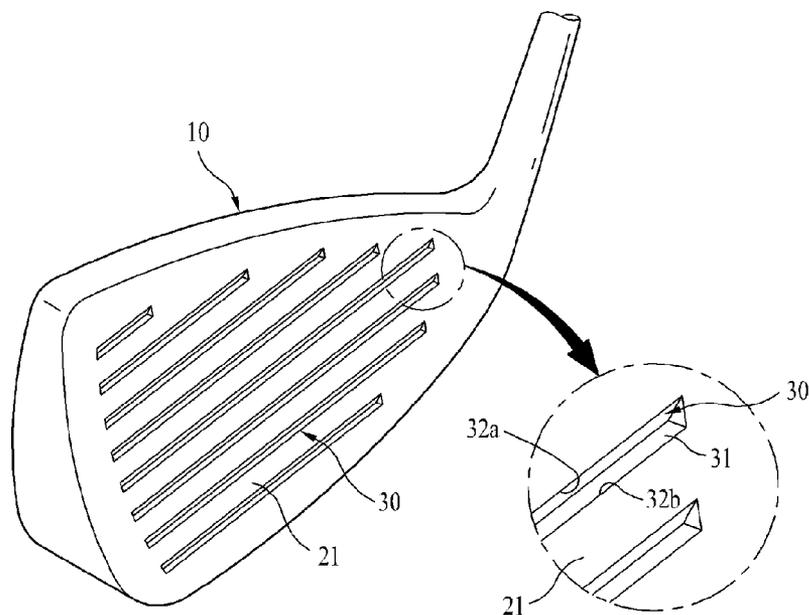


FIG. 4

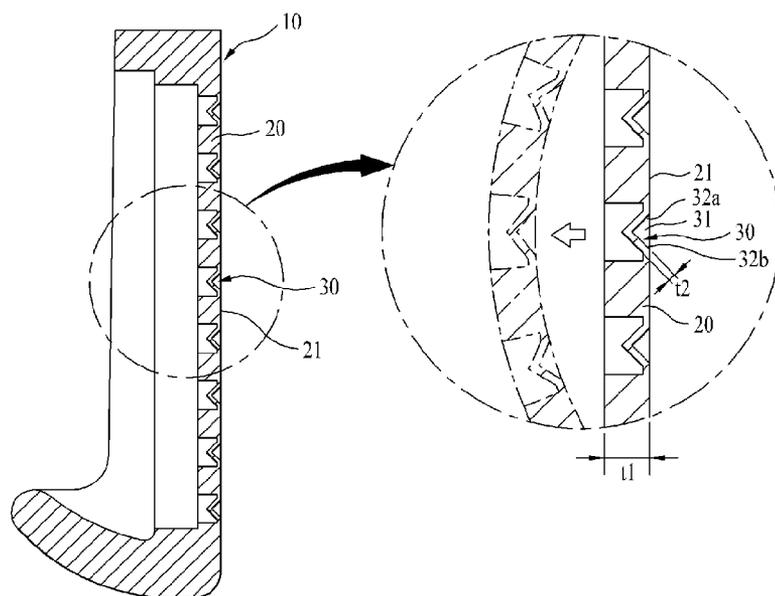


FIG. 5

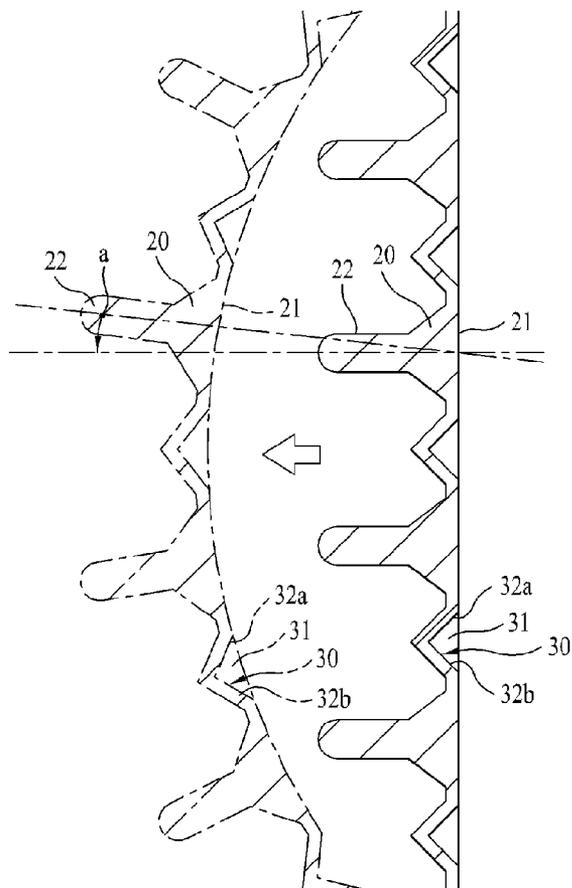


FIG. 6

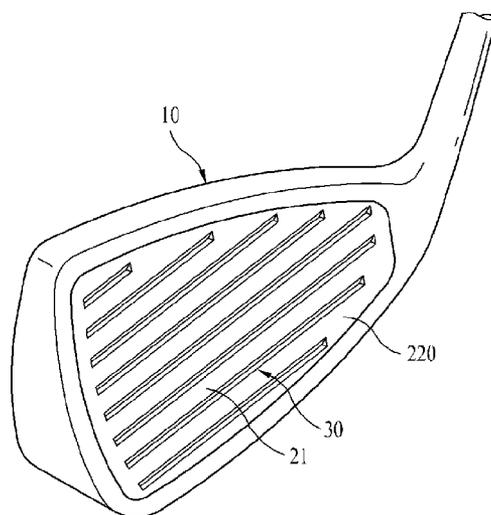


FIG. 7

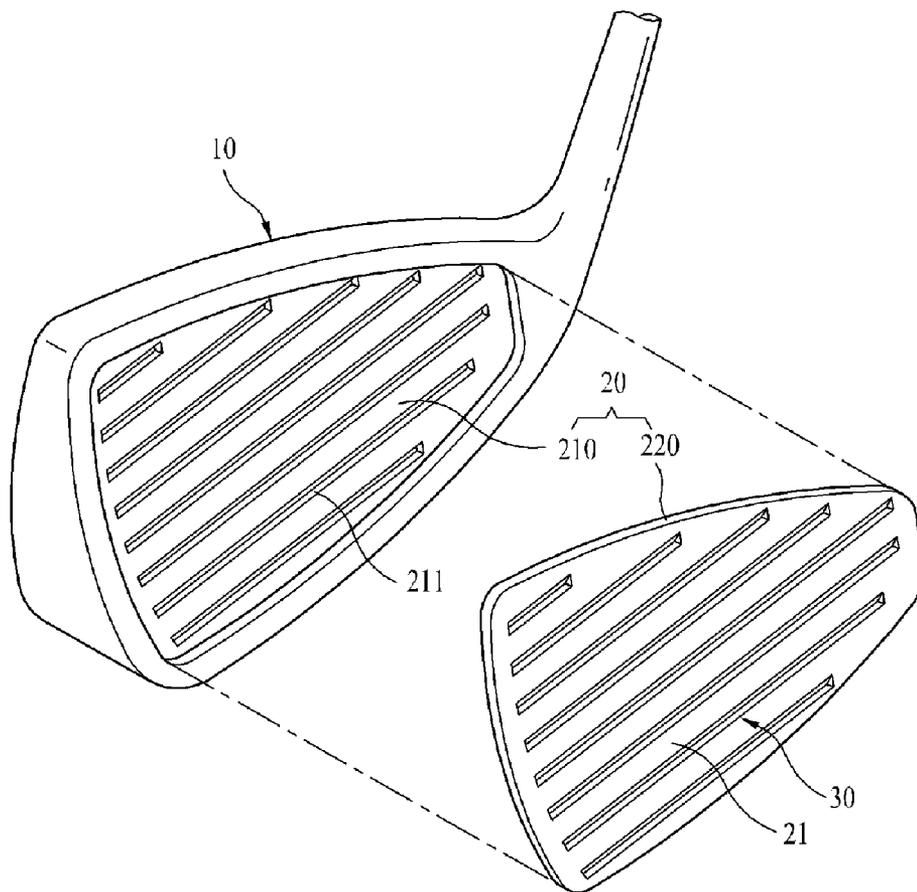


FIG. 8

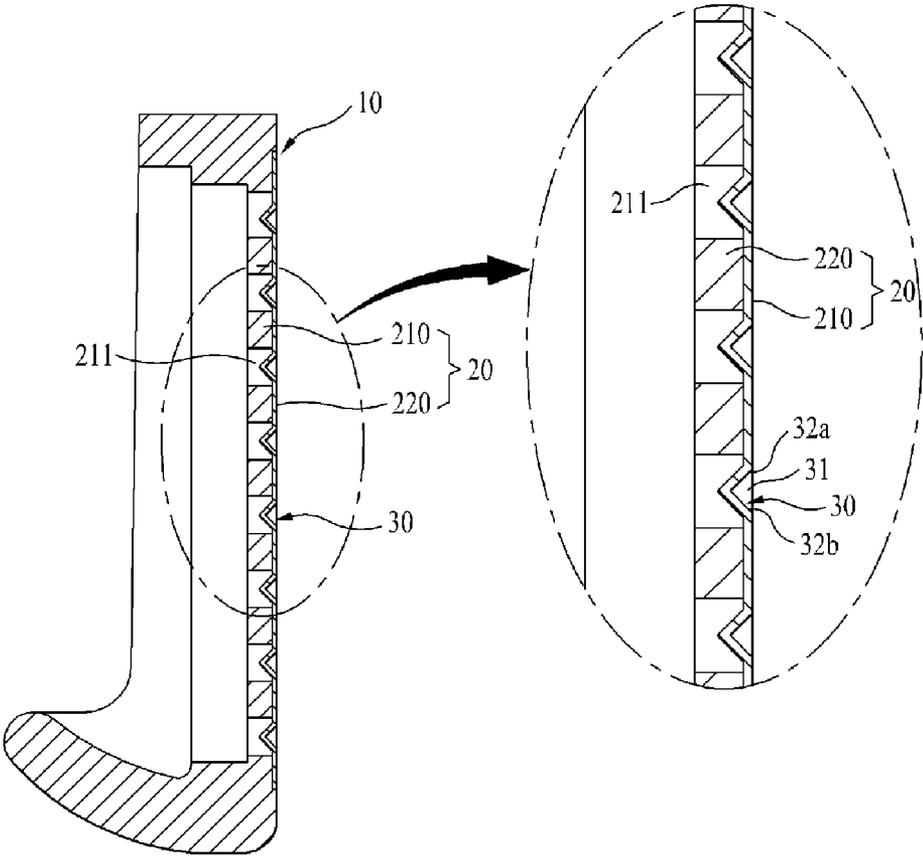
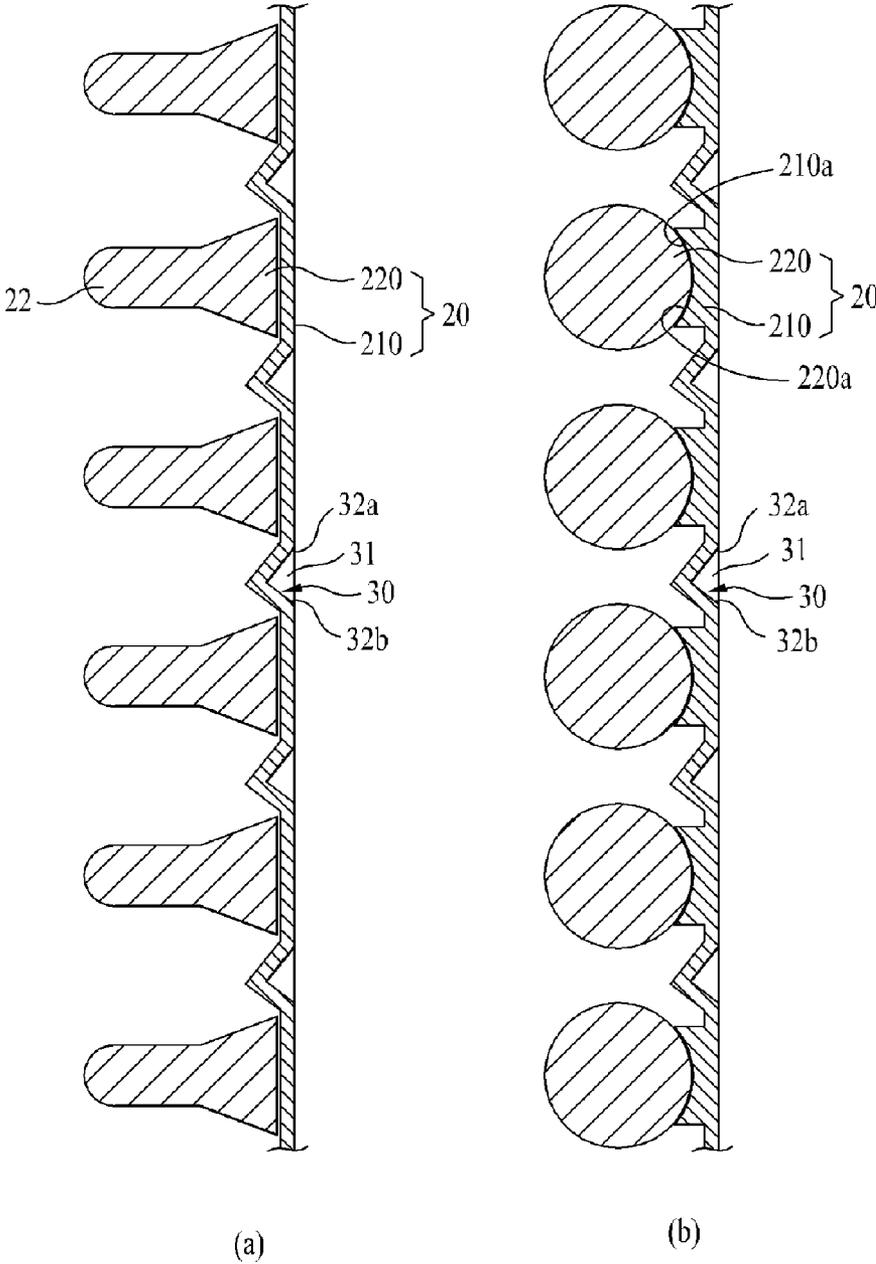
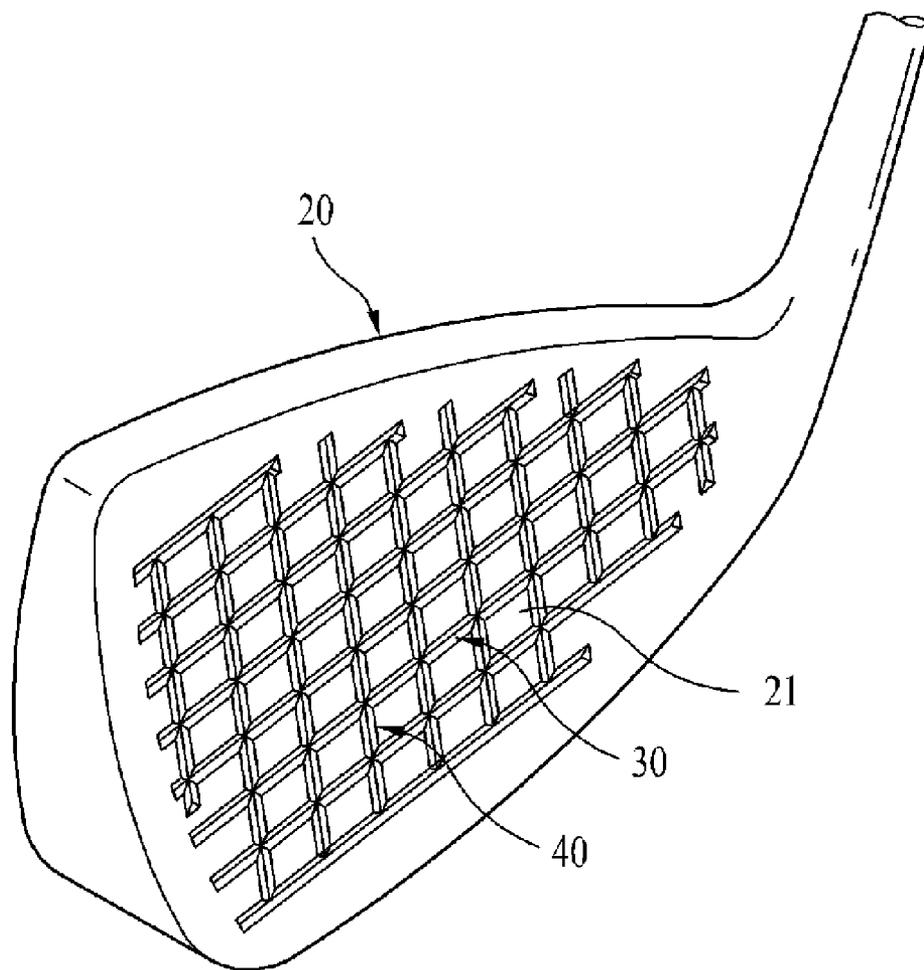


FIG. 9



**FIG. 10**



## GOLF CLUB HEAD

### CROSS-REFERENCE TO RELATED APPLICATION

**[0001]** This application claims priority to and the benefit of Korean Patent Application No. 2010-083734, filed on Aug. 28, 2010, the disclosure of which is incorporated herein by reference in its entirety.

### BACKGROUND

**[0002]** 1. Field of the Invention

**[0003]** The present invention relates to a golf club head, and more particularly, to a golf club head capable of improving a repulsive power of a striking surface to increase a driving distance and further improving stability of a ball-flying direction and a spin function of a ball using a corner part of a groove formed on the striking surface.

**[0004]** 2. Discussion of Related Art

**[0005]** In general, golf clubs are classified into three kinds, i.e., drivers for causing golf balls to fly a long distance, irons for striking balls onto a green of a fair way, and putters for accurately striking balls on the green to put the balls into holes. A basic configuration of each golf club includes a head having a striking surface, a shaft, and a grip.

**[0006]** FIGS. 1 and 2 illustrate an example of a head of a conventional golf club. The club head 1 is formed of a high strength metal material such as titanium, titanium alloy, or the like, and has a striking surface 2 configured to contact a golf ball when the club head 1 strikes the golf ball. A plurality of straight grooves 3 are laterally formed and longitudinally disposed on the striking surface 2. A plurality of corner parts 3a and 3b are laterally formed and longitudinally disposed on the striking surface 2 due to formation of the grooves 3. The corner parts 3a and 3b prevent slide of the ball upon striking to increase stability and accuracy of a ball-flying direction, and provide a spin to the ball, for example, to cause to ball to fly high or to stop or move an on-green ball backward, without causing the ball to over run.

**[0007]** In golf, an ability of adjusting a ball-flying direction, a flying distance, a ball spin, and so on, is very important, and such ability is basically constituted by a wing posture, power, striking technique, and so on. Professional or amateur golfers are subjected to difficulties due to lack of adjustability related to the ball-flying direction, flying distance, ball spin, and so on, caused by differences in individual ability upon striking, and make steady efforts to improve such ability.

**[0008]** However, people who play golf for the purpose of interest or exercise have insufficient ability related to basic swing posture, power and striking technique, and a lack of effort and time to improve the ability. For this reason, stability in ball-flying direction is decreased, a flying distance is insufficient, and various techniques such as straight driving, back spin, slicing, and so on, according to a level of ball spin, cannot be easily used. As a result, due to lack of ability, some people cannot perform a desired swing to enjoy golf so that they lose interest in golf and consequently avoid playing golf.

### SUMMARY OF THE INVENTION

**[0009]** In order to solve the above problems, the present invention is directed to a golf club head including a variation part, which is easily flexible, formed at a striking surface of a head, and capable of increasing repulsive power caused by an elastic deformation rate of the striking surface upon striking a

ball to improve a flying distance, and strengthening an elastic recovering force of corner parts formed by the variation part to further enhance stability in a ball-flying direction and a ball spin function.

**[0010]** According to an aspect of the present invention, there is provided a golf club head provided with a striking plate having a striking surface configured to contact a ball upon striking the ball, characterized in that the striking surface of the striking plate has a plurality of variation parts formed in a lateral direction and disposed in a longitudinal direction, wherein each of the variation parts has a thickness (t2) smaller than a thickness (t1) of the striking plate, upper and lower sides of the variation part are continuously formed with the striking plate, and a center part of the variation part is concavely recessed from the striking surface to form a groove on the striking surface.

**[0011]** Preferably, the center part of the variation part is recessed in a V or U shape to form corner parts at the upper and lower sides of the variation part, and the striking plate disposed between the variation parts has a gravity center extension projecting rearward therefrom.

**[0012]** Preferably, the striking plate is constituted by an inner plate and an outer plate coupled to a front surface of the inner plate to form the striking surface and having a thickness smaller than that of the inner plate, the variation part is formed at the outer plate, and the inner plate has a through-hole in which the variation part is positioned and received.

**[0013]** Preferably, mutual contact parts of the outer plate and the inner plates have an arc-shaped part and an arc-shaped groove, respectively. Preferably, the variation part in the longitudinal direction crossing the variation part in the lateral direction is laterally disposed in plural.

**[0014]** According to the golf club head of the present invention, the variation part formed at the striking surface of the striking plate has a thickness smaller than that of the striking plate, upper and lower sides of the variation part are continuously formed with the striking plate, and a center part of the variation part is recessed from the striking surface to form a groove on the striking surface. Therefore, the variation part can be easily and elastically deformed upon striking a golf ball to increase an elastic deformation rate at which the striking surface of the striking plate is deformed inward, and thus, an elastic recovery force of the striking plate itself and an elastic recovery force of the variation part can also be increased to further improve a flying distance of the golf ball.

**[0015]** In addition, since a position of a center of gravity of the striking plate is far away from the striking surface by a gravity center extension projecting rearward from the striking plate, rotation moment of the gravity center extension is increased upon recovery of the elasticity of the striking surface, and thus, the increased rotation moment of the gravity center extension is applied to upper and lower corner parts of the groove, so that anti-slide of a golf ball, stability of a ball-flying direction and a spin function of a golf ball can be further improved.

**[0016]** As described above, the golf club head of the present invention helps people who enjoy golf for the purpose of interest or exercise or beginners who have insufficient abilities such as a basic swing posture, power and swing technique strengthen a recovering force upon strike so as to improve the flying distance. In addition, a function of the corner parts formed at the striking surface can be improved to increase stability of the ball-flying direction, and various swing tech-

niques can be performed by the ball spin so that people can be more interested in golf and enjoy golf.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The above and other objects, features and advantages of the present invention will become more apparent to those of ordinary skill in the art by describing in detail exemplary embodiments thereof with reference to the accompanying drawings, in which:

[0018] FIG. 1 is a front view showing a conventional golf club head;

[0019] FIG. 2 is a cross-sectional view of the golf club head shown in FIG. 1;

[0020] FIG. 3 is a perspective view showing a golf club head in accordance with a first embodiment of the present invention;

[0021] FIG. 4 is a cross-sectional view of the golf club head shown in FIG. 3;

[0022] FIG. 5 is a cross-sectional view showing a variation of the first embodiment of the present invention;

[0023] FIG. 6 is a perspective view of a golf club head in accordance with a second embodiment of the present invention;

[0024] FIG. 7 is an exploded perspective view of an outer plate of FIG. 6;

[0025] FIG. 8 is a cross-sectional view of the outer plate shown in FIG. 6;

[0026] FIGS. 9A and 9B are cross-sectional views of major parts showing a variation of the second embodiment of the present invention; and

[0027] FIG. 10 is a perspective view of a golf club head in accordance with a third embodiment of the present invention.

#### DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0028] Exemplary embodiments of the present invention will be described in detail below with reference to the accompanying drawings. While the present invention is shown and described in connection with exemplary embodiments thereof, it will be apparent to those skilled in the art that various modifications can be made without departing from the spirit and scope of the invention.

[0029] FIGS. 3 and 4 are a perspective view and a cross-sectional view showing a first embodiment of a golf club head in accordance with the present invention. As shown in drawings, a head 10 includes a striking plate 20 having a striking surface 21 configured to contact a golf ball upon striking. A variation part 30 is longitudinally formed at the striking surface 21 of the striking plate 20.

[0030] The variation part 30 is provided in plural at predetermined intervals in a vertical direction of the striking surface 21, and thus, the striking surface 21 includes a plurality of divisional striking surfaces divided by the variation parts 30 in a vertical direction and longitudinally formed in a lateral direction.

[0031] In addition, the variation part 30 has a thickness  $t_2$  smaller than a thickness  $t_1$  of the striking plate 20 having the striking surface 21, upper and lower sides continuously formed with the striking surface 20, and a center part concavely formed from the striking surface 21 to form a groove 31 on the striking surface 21. Such a variation part 30 can be easily and elastically deformed to increase an elastic defor-

mation rate at which the striking surface 21 of the striking plate 20 is deformed inward upon striking a golf ball.

[0032] Therefore, when a golf ball is struck, as shown by an imaginary line in an enlarged portion of FIG. 4, an elastic deformation rate at which the striking surface 21 is deformed inward is increased in comparison with the conventional art, and thus, repulsive power upon striking can be increased to further improve a flying distance.

[0033] In addition, since increase in an elastic deformation rate of the striking surface 21 enables absorption of an impact upon striking, an impact transmitted to hands, which grasp the grip, through a shaft can be reduced, and a striking sound is lighter to provide a good feeling.

[0034] Meanwhile, the variation part 30 may be recessed in a V-shape as shown in drawings, or a U-shape (while not shown), so that corner parts 32a and 32b are formed at upper and lower sides of the variation part 30. Since the upper and lower corner parts 32a and 32b, which are formed in a lateral direction of the striking surface 21, are longitudinally disposed in plural, slide of the striking surface upon striking a golf ball can be prevented to promote accuracy of the striking and stability in ball-flying direction and provide rotation such as a spin, and so on, to the ball.

[0035] FIG. 5 is a cross-sectional view of major parts showing a variation of the first embodiment of FIG. 5 having the same configuration as the first embodiment, except that gravity center extensions 22 project rearward from the striking plates 20 between the variation parts 30, respectively.

[0036] According to this configuration, since a position of a center of gravity of the striking plate 20 is further away from the striking surface 21, when the striking surface 21 is elastically deformed and recovered by striking a golf ball as shown by a solid line and an imaginary line in FIG. 5, a rotational moment of the gravity center extension 22 is increased. As a result, since the increased rotation moment of the gravity center extension 22 is applied to the upper and lower corner parts 32a and 32b of the groove 31, an anti-slide function of a golf ball, stability of a ball-flying direction and a spin function of a golf ball can be further improved.

[0037] FIGS. 6 to 8 are, respectively, a perspective view, an exploded perspective view and a cross-sectional view of a golf club head in accordance with a second embodiment of the present invention. In the configuration of the first embodiment, the striking surface 20 is constituted by an inner plate 210, and an outer plate 220 adhered to or press-fitted into a front surface of the inner plate 210 to form the striking surface 21, the outer plate 220 has a thickness larger than that of the inner plate 210. In addition, the variation part 30 of the first embodiment is formed on the outer plate 220 in the same manner, and a through-hole 211 in which the variation part 30 is accommodated is formed in the inner plate 210.

[0038] According to the above configuration, similar to the first embodiment, an elastic deformation rate that the striking surface 21 is deformed inward by elastic deformation of the variation part 30 upon striking a golf ball is increased in comparison with the conventional art, a flying distance can be further improved, and the upper and lower corner parts 32a and 32b of the variation part 30 can perform functions of anti-slide of the golf ball upon striking, stability of the ball-flying direction, ball spin, and so on.

[0039] In addition, according to another variation of the second embodiment of the present invention, as shown in FIG. 9(a), the gravity center extension 22 projects rearward from the inner plate 210 to increase rotation moment of the

gravity center extension 22 so that anti-slide of a golf ball, stability of a ball-flying direction and a spin function of the golf ball can be further improved. In still another embodiment, as shown in FIG. 9(b), an arc-shaped part 210a and an arc-shaped groove 220a are formed at mutual contact parts of the outer plate 220 and the inner plate 210, respectively, so that slide contact between the inner plate 210 and the outer plate 220 can be smoothly performed when the striking plate 20 is elastically deformed.

[0040] FIG. 10 is a perspective view of a golf club head in accordance with a third embodiment of the present invention. In the configuration of the first embodiment, the variation part 40 in the longitudinal direction crossing the variation part 30 in the lateral direction may be laterally disposed in plural to improve elastic deformation rates of the striking plate 20 in the longitudinal direction as well as the lateral direction. In addition, while not shown, in the configuration of the second embodiment, the variation part 40 in the longitudinal direction crossing the variation part 30 in the lateral direction formed in the outer plate 220 may be laterally disposed in plural to improve elastic deformation rates of the striking plate 20 in the longitudinal direction as well as the lateral direction.

[0041] It will be apparent to those skilled in the art that various modifications can be made to the above-described exemplary embodiments of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention covers all such modifications provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A golf club head provided with a striking plate having a striking surface configured to contact a ball upon striking the ball, characterized in that:

the striking surface of the striking plate has a plurality of variation parts formed in a lateral direction and disposed in a longitudinal direction, wherein each of the variation parts has a thickness (t2) smaller than a thickness (t1) of the striking plate, upper and lower sides of the variation part are continuously formed with the striking plate, and a center part of the variation part is concavely recessed from the striking surface to form a groove on the striking surface.

2. The golf club head according to claim 1, wherein the center part of the variation part is recessed in a V or U shape to form corner parts at the upper and lower sides of the variation part.

3. The golf club head according to claim 1, wherein the striking plate disposed between the variation parts has a gravity center extension projecting rearward therefrom.

4. The golf club head according to claim 1, wherein the variation part in the longitudinal direction crossing the variation part in the lateral direction is laterally disposed in plural.

5. The golf club head according to claim 1, wherein the striking plate is constituted by an inner plate and an outer plate coupled to a front surface of the inner plate to form the striking surface and having a thickness smaller than that of the inner plate, the variation part is formed at the outer plate, and the inner plate has a through-hole in which the variation part is positioned and received.

6. The golf club head according to claim 5, wherein the gravity center extension projects rearward from the inner plate disposed between the variation parts.

7. The golf club head according to claim 5, wherein mutual contact parts of the outer plate and the inner plates have an arc-shaped part and an arc-shaped groove, respectively.

8. The golf club head according to claim 2, wherein the striking plate disposed between the variation parts has a gravity center extension projecting rearward therefrom.

9. The golf club head according to claim 2, wherein the variation part in the longitudinal direction crossing the variation part in the lateral direction is laterally disposed in plural.

10. The golf club head according to claim 2, wherein the striking plate is constituted by an inner plate and an outer plate coupled to a front surface of the inner plate to form the striking surface and having a thickness smaller than that of the inner plate, the variation part is formed at the outer plate, and the inner plate has a through-hole in which the variation part is positioned and received.

11. The golf club head according to claim 10, wherein the gravity center extension projects rearward from the inner plate disposed between the variation parts.

12. The golf club head according to claim 10, wherein mutual contact parts of the outer plate and the inner plates have an arc-shaped part and an arc-shaped groove, respectively.

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