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Attorneys for Plaintiff, NIKE, Inc.

UNITED STATES DISTRICT COURT
DISTRICT OF OREGON

NIKE, INC.,
An Oregon Corporation,

Case No.

Plaintiff,

v.

SASO GOLF, INC.,
An Illinois Corporation,

SASO GRIND SPORTS, INC.,
A Japanese Corporation,

MITSUHIRO SASO,
Individually, and

JOHN DOE,

Defendants.

**COMPLAINT for
Declaratory Judgment
Of No Patent Infringement**

JURY TRIAL DEMANDED

Plaintiff, NIKE, Inc., seeks a declaratory judgment against Defendants that it does not infringe United States Patent Nos. 5,645,495 (“the ‘495 patent”) and 6,620,055 (“the ‘055 patent”). Copies of the ‘495 and ‘055 patents are attached as Complaint Exhibits A and B respectively. NIKE further states:

THE PARTIES

1. Plaintiff, NIKE, Inc. (“NIKE”) is a corporation organized under the laws of the State of Oregon and has a principal place of business at One Bowerman Drive, Beaverton, Oregon 97005.

2. Defendant Saso Golf, Inc. is a corporation organized under the laws of the state of Illinois and has a principal place of business at 30 North LaSalle Street, Suite 2630, Chicago, Illinois 60602 (hereafter “Saso Golf”). Saso Golf is the record owner by assignment of the ‘495 and ‘055 patents. On information and belief, the Illinois Secretary of State involuntarily dissolved Saso Golf on November 1, 2005, for its failure to file a 2005 annual report.

3. Defendant Saso Grind Sports, Inc. is a corporation organized under the laws of the country of Japan and has a principal place of business at 145, Hojo-Umeharacho, Himeji-city, 670-0945, Japan (hereafter “Saso Grind”). On information and belief, Saso Grind is a licensee manufacturing, marketing, and/or selling products allegedly covered by the ‘495 and ‘055 patents.

4. Defendant Mitsuhiro Saso (hereafter “Mr. Saso”) is, on information and belief, an individual residing at Kanzaki-gun, Hyogo 679-24, Japan. Mr. Saso is the owner and president of Saso Golf and Saso Grind, and the sole inventor named on the ‘495 and ‘055 patents.

5. On information and belief, defendant(s) John Doe(s) is/are entities that own an interest in asserting the ‘495 and ‘055 patents against NIKE.

JURISDICTION AND VENUE

6. This action arises under the Declaratory Judgment Act, 28 U.S.C. §§ 2201-02, Rule 57, Federal Rules of Civil Procedure, and the Patent Laws of the United States, 35 U.S.C. §§ 1 *et seq.*, to resolve an actual and justiciable controversy, which now exists between the parties within the jurisdiction of this Court.

7. NIKE seeks a declaratory judgment that certain of its golf club products do not infringe the '495 and '055 patents.

8. This Court has subject matter jurisdiction over this dispute pursuant to 28 U.S.C. §§ 1331, 1338(a), and 2201.

9. This Court may exercise personal jurisdiction over Defendants based upon their contacts with this judicial district, including their business solicitations within the forum, and based upon their intentional threats of suit against a known forum resident, *i.e.*, NIKE.

10. Venue is proper in this judicial district pursuant to 28 U.S.C. §§ 1391(b) and (c), and because Defendants solicit business here and made threats of suit within this judicial district.

GENERAL ALLEGATIONS

11. Mr. Saso is the sole inventor named on the '495 and '055 patents. (Complaint Exhibits A and B). On information and belief, Mr. Saso established Saso Grind in Japan to make and/or sell golf clubs around the world.

12. On information and belief, Mr. Saso established Saso Golf in June 2003 for the purpose of enforcing at least the '495 patent in the United States.

13. On July 7, 2003, Saso Golf filed a complaint against Callaway Golf Company, Callaway Golf Sales Company, and Pro Select Sports USA, in the United States District Court for the Northern District of Illinois, Civil Action No. 1:03-cv-04646, alleging infringement of the

'495 patent. On information and belief, Defendants settled their dispute against Callaway et al.

14. On information and belief, Defendants have entered into agreements with one or more entities for the purpose of selling allegedly patented golf clubs and for enforcing the '495 and '055 patents, as well as corresponding foreign patents.

15. In early August 2006, Mr. Saso wrote to NIKE alleging that NIKE's SasQuatch 460 Drivers, NIKE's SasQuatch Tour 460 Drivers, and NIKE's SasQuatch Fairway Woods (hereafter "SasQuatch products") infringe the '495 and '055 patents. NIKE responded, and explained that its SasQuatch products are not covered by any valid claim of the '495 or '055 patents.

16. On August 14, 2006, Mr. Saso again wrote to NIKE, alleging that NIKE's SasQuatch products infringe the '495 and '055 patents, as well as corresponding foreign patents. (Complaint Exhibit C). Mr. Saso's letter indicates that one or more of Defendants and/or their licensees may "want[] to file an injunction law suit against [NIKE]." (*Id.*, at p. 2). In closing, Mr. Saso demands that NIKE respond to Defendants' offer to take a license under the '495 and '055 patents no later than the end of August, or else, he threatened that Defendants would file a lawsuit against NIKE. (*Id.*, at p. 3).

17. Because Defendants' threats have raised an actual and justiciable controversy with NIKE, and because NIKE's SasQuatch products are not covered by any valid claim of the '495 or '055 patents, NIKE seeks a declaration that its products do not infringe the '495 or '055 patents.

**COUNT I:
DECLARATORY JUDGMENT THAT NIKE DOES
NOT INFRINGE THE '495 or '055 PATENTS**

18. NIKE specifically repeats and realleges the allegations of paragraphs 1-17 of this

Complaint as though fully set forth herein.

19. Defendants own the '495 and '055 patents and/or own or control the right to sue for infringement thereof.

20. Defendants allege that NIKE infringes the '495 and '055 patents.

21. NIKE has not infringed and does not infringe any claim of the '495 or '055 patents, either literally or under the doctrine of equivalents, nor has it contributed to infringement by others, nor actively induced others to infringe any claim of the '495 or '055 patents.

RELIEF REQUESTED

WHEREFORE, NIKE respectfully requests that:

- A. The Court enter a declaratory judgment that NIKE does not infringe the '495 or '055 patents;
- B. The Court award NIKE its attorney's fees and costs in bringing this action; and
- C. The Court award such other and further relief as it may deem just and proper.

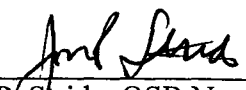
DEMAND FOR JURY TRIAL

Pursuant to Fed. R. Civ. P. 38, NIKE demands a jury trial on all issues raised in this Complaint triable to a jury.

Respectfully submitted,

Dated: August 31, 2006

By:



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US005645495A

United States Patent [19]

Saso

[11] **Patent Number:** 5,645,495[45] **Date of Patent:** Jul. 8, 1997[54] **GOLF CLUB**[75] **Inventor:** Mitsuhiro Saso, Kanzaki-gun, Japan[73] **Assignee:** Himeji Lodge Hakuba Co., Ltd.,
Himeji, Japan[21] **Appl. No.:** 479,142[22] **Filed:** Jun. 7, 1995**Related U.S. Application Data**[63] Continuation of Ser. No. 321,588, Oct. 11, 1994, abandoned,
which is a continuation of Ser. No. 962,586, filed as PCT/
JP92/00303 Mar. 13, 1992 published as WO92/19327 Nov.
12, 1992, abandoned.[30] **Foreign Application Priority Data**May 1, 1991 [JP] Japan 3-130375
Dec. 21, 1991 [JP] Japan 3-355888[51] **Int. Cl.⁶** A63B 53/04[52] **U.S. Cl.** 473/345; 473/349[58] **Field of Search** 273/167 R, 168,
273/78, 169, 170, 171, 172, 173, 174, 175,
167 A, 77 A, 77 R, 193 R, 194 R, 194 B,
164.1, 187.4, 186.2; 473/324-350[56] **References Cited****U.S. PATENT DOCUMENTS**

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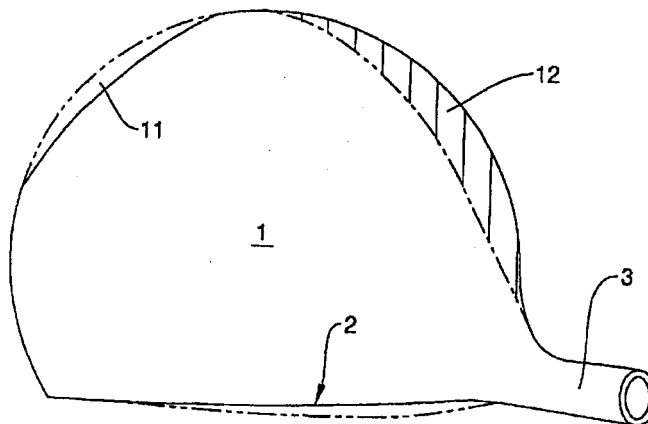
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Primary Examiner—Sebastiano Passaniti
Attorney, Agent, or Firm—Smith Patent Office[57] **ABSTRACT**

A golf club for improving the flying distance of a ball overcomes toe-down phenomenon due to pulling of the shaft particularly by a skilled player enjoying a high head speed. The golf club further improves the head speed and the directional stability of a hit ball. The golf club has a center of gravity of the head shifted from the toe end of the shaft end by modifying the head shape to decrease the volume of the head by a certain amount at the toe end on the rear side thereof and to increase the head volume at the shaft end on the rear side by an amount equal to the decreased amount. This will reduce the rotational radius of the head about a vertical line, as a rotational center line, when the golf club is suspended at the upper end of the shaft. Furthermore, with a metal wood club, a head is provided with a face which comprises a spherical face formed in such a manner that the curvature in the transverse width direction becomes substantially equal to that in the vertical width direction.

7 Claims, 8 Drawing Sheets

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FIG. 1

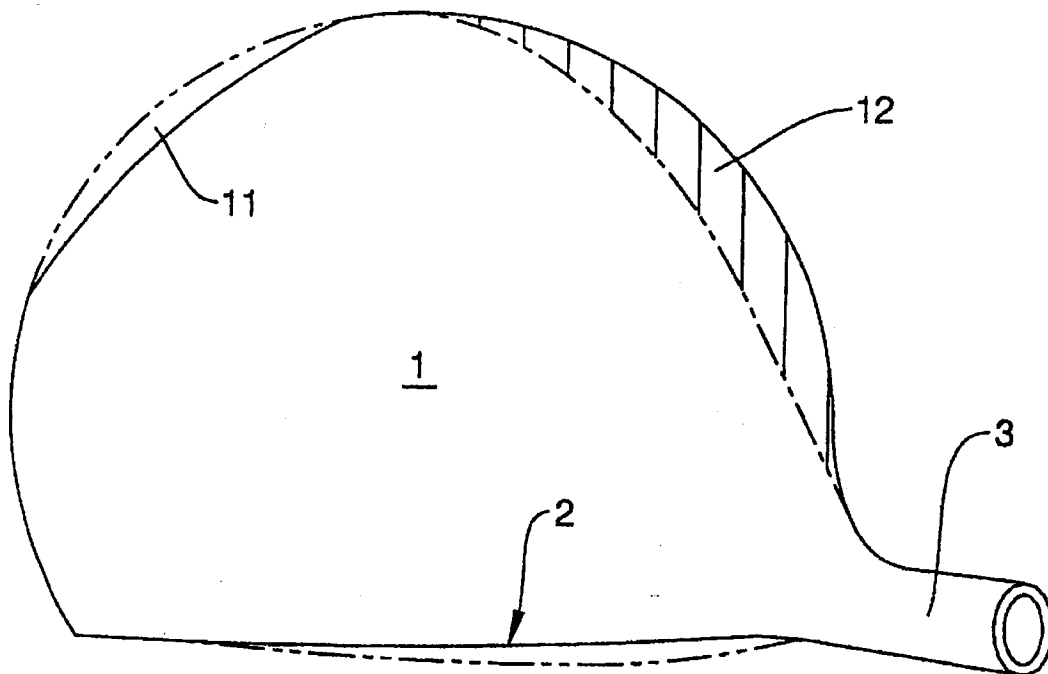
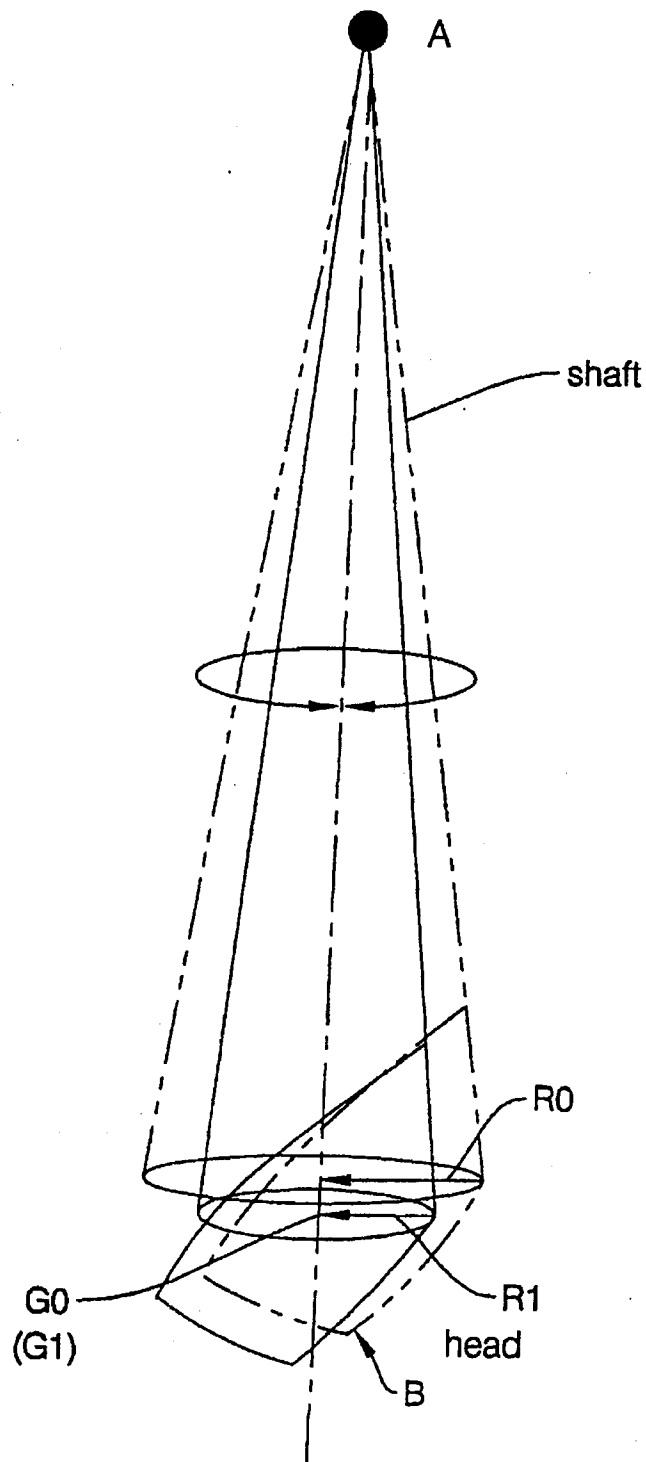


FIG. 2



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FIG. 3A

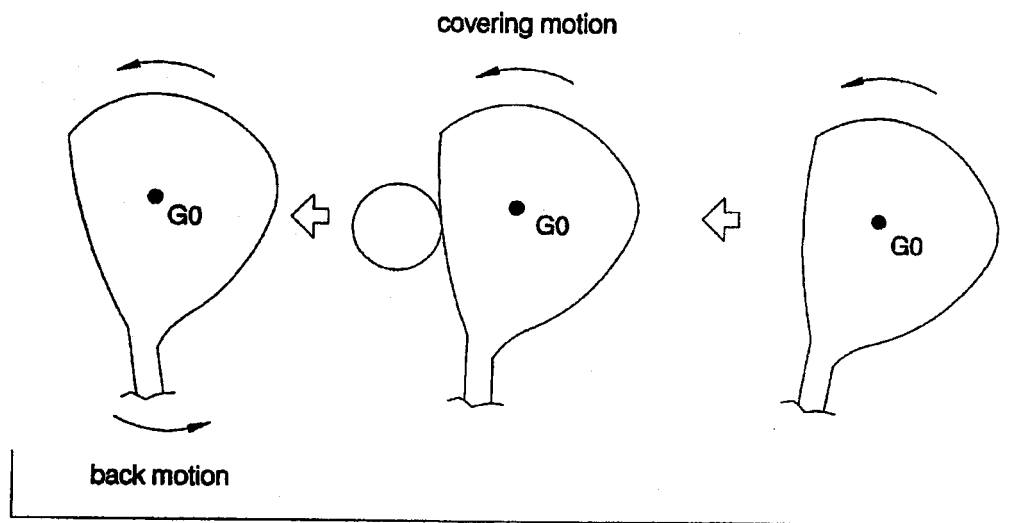
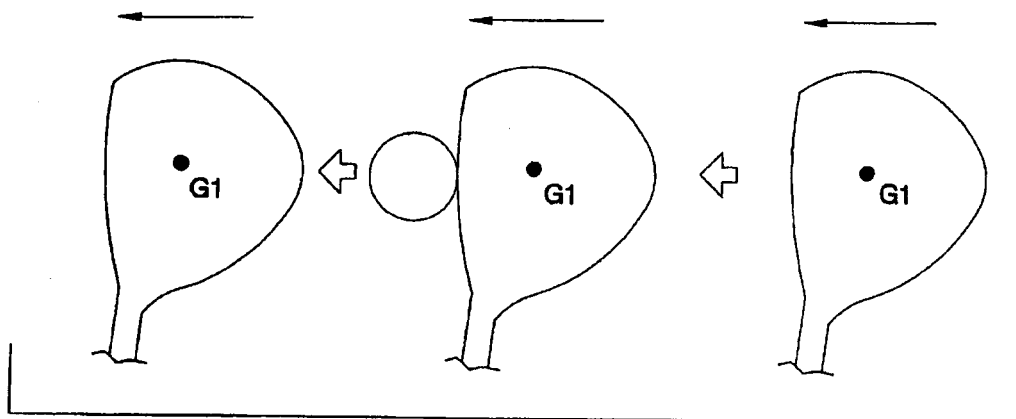


FIG. 3B



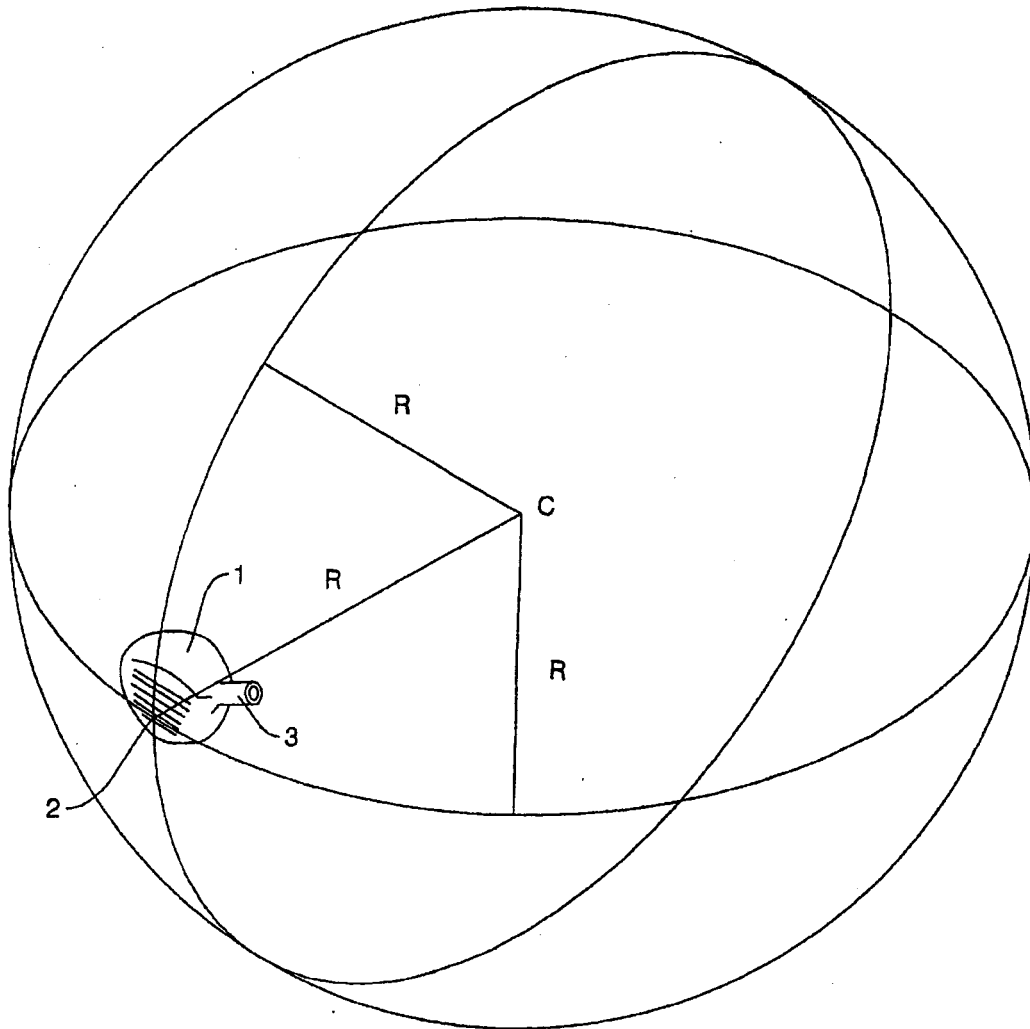
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FIG. 4



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FIG. 5

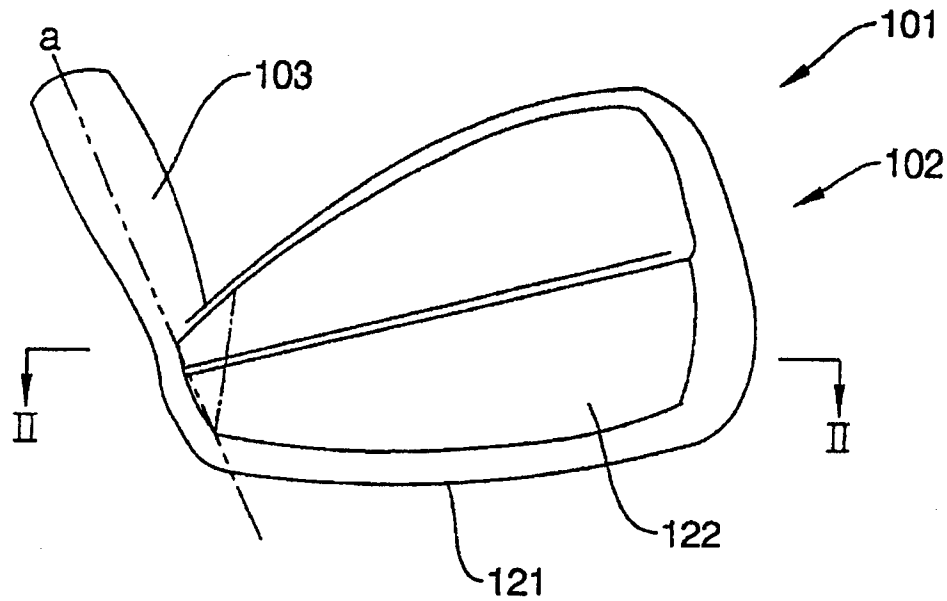
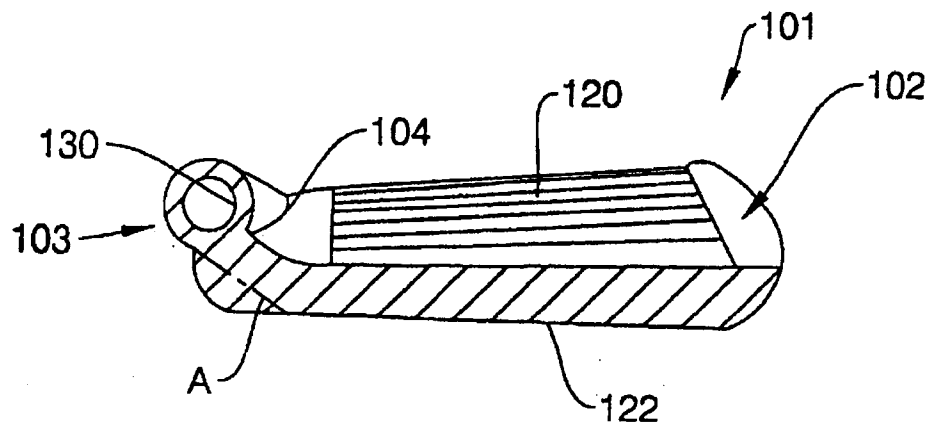


FIG. 6



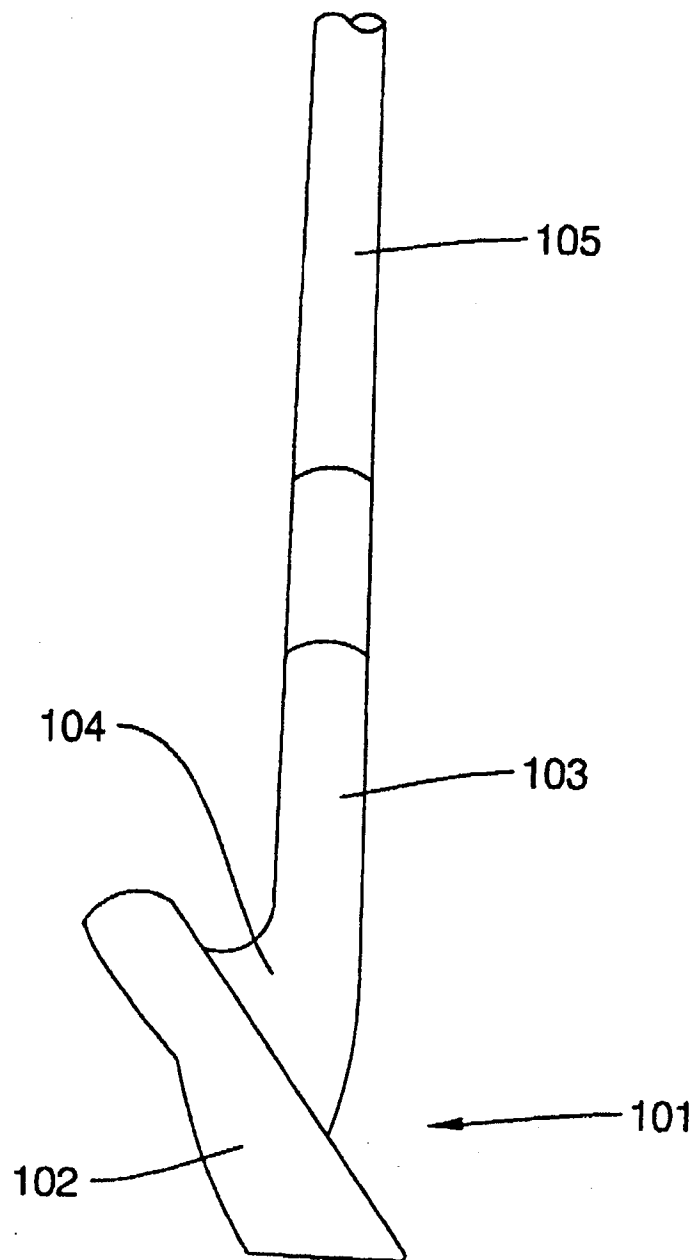
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FIG. 7



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FIG. 8

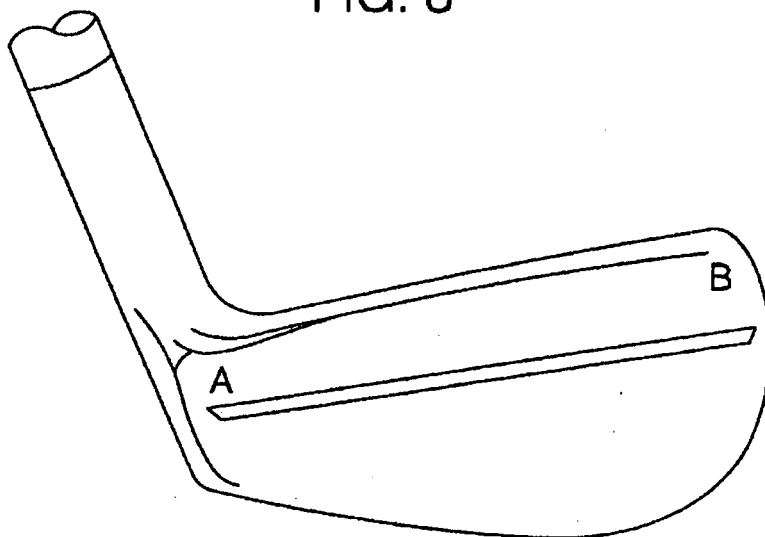


FIG. 9

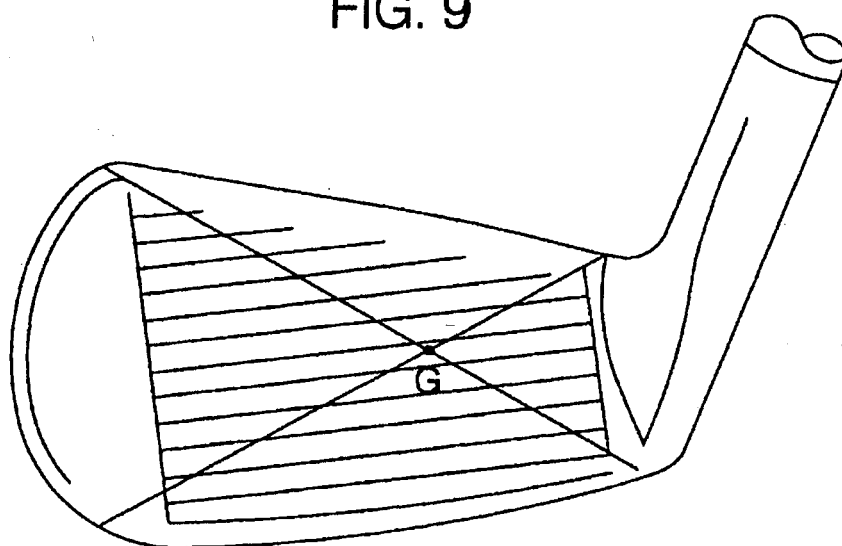


FIG. 10

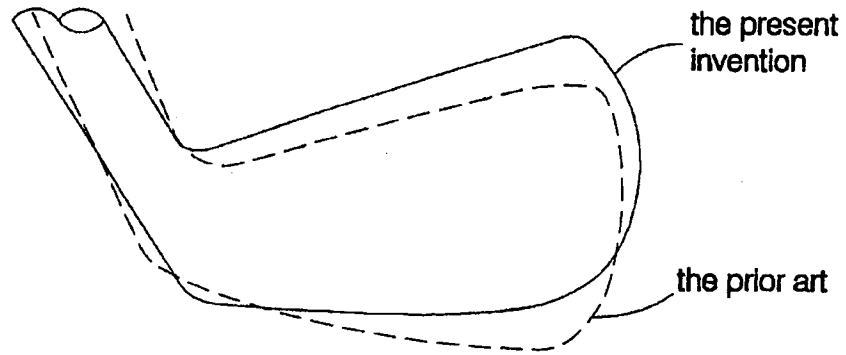


FIG. 11A
the prior art

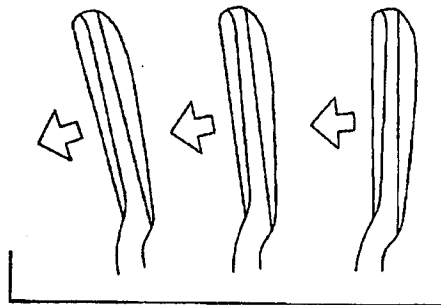
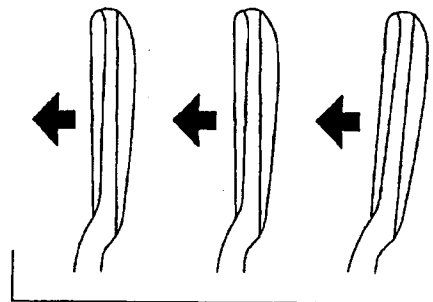


FIG. 11B
the present invention



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GOLF CLUB

This application is a continuation, of application Ser. No. 08/321,588 filed on Oct. 11, 1994, now abandoned, which is a Continuation application of Ser. No. 07/962,586 filed on Dec. 30, 1992 which was abandoned.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention relates to a golf club by which the directional stability and flight distance of a shot ball can be improved.

2. Description of the Related Art

In a conventional wooden club, as well as to a metal wood club, a head is in such a shape that, as shown by two dashed line in FIG. 1, it gradually expands from a shaft side to a toe side. The center of gravity of the head is set at a position inclined toward the toe side rather than the center of the projection plane of the head, thereby the head speed of the golf club may be increased at the time of impacting on the ball.

Also in a conventional golf club of an iron type, according to the similar theory, an end of the back side of a club face part is, when seen from a plane, smoothly connected to the hosel, through a neck part, forming a curve (See dashed line A in FIG. 6) and thus the center of gravity of the club is set at a position slightly inclined toward a toe side.

However, when the center of gravity of the head inclines toward the toe side, as shown by two dashed line in FIG. 2, and when the head B is rotated with holding an end A of the club shaft, a radius R_0 of the rotation, with its center line of the rotation positioned at the vertical line made by suspending an upper end of the shaft, increases. Therefore, the metal wood club and the iron club, as shown in FIGS. 3(a) and 11(a), respectively, are apt to cause covering motion (which means the phenomenon that the toe side goes fast than the shaft side as if the toe side rotates around the shaft side) at each head toe side just before impacting.

For the purpose of inhibiting a hook flying of the shot ball, caused by the covering motion, in the metal wood club, as shown by two dashed line in FIG. 1, a head face surface usually has such a shape that the shaft side expands slightly more forward than the toe side. Accordingly, curvature along the transverse direction of the face surface and curvature along longitudinal direction of the face surface are not the same; usually curvature along longitudinal direction is larger than that along the transverse direction.

On the other hand, as shown in FIG. 10, the covering motion is not the only problem in the iron club; that is, the center of gravity of the iron club slightly inclines toward the toe side in the club face part, therefore for advanced golfers whose down swings are faster than those of beginners, a toe down phenomenon, in which the neck part is twisted downwardly by an accelerated motion applied to the head and thus the toe side of the club face part tends to be lowered, resulting in a duff shot.

SUMMARY OF THE INVENTION

Accordingly, for the purpose of overcoming the defects of the conventional club head, the inventor, as a result of his sharp research, has converted the basic concept of designing the club head to a new one in order to provide a golf club head by which improvement in the directional stability and flight distance of the shot ball can be realized. That is the object of the present invention.

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The present invention has been completed on the inventive concept that due to the property of the sling motion of the club head round the gravity center thereof, in which a heavier part goes forward and a lighter part does not catch up with the heavier part in a manner that the heavier part and the lighter part rotate around the gravity center axis, the conventional club head is subjected not only to the above-mentioned covering movement but also to a pull-back phenomenon in the shaft side as a reaction of the covering movement, accordingly resulting in substantial decrease of the speed of the head. The present invention is, therefore, to provide a golf club which head is formed in such a manner that the amount of a shaft side is increased as much as the amount of a head toe side is decreased so as to shift the center of gravity of the head toward the shaft side and a radius of a rotation, with its center line of the rotation positioned at a vertical line made by suspending an upper end of a shaft, is decreased.

Mere shift of the center of gravity of the head toward the shaft side is not enough to overcome the covering motion of the head; at the same time, the weight balance of the head must be maintained. Therefore, it is advantageous to increase the amount of the shaft side in the head as much as that of the toe side decreases so as to maintain the weight balance of the head. Due to this, the center of gravity of the head usually inclines toward the shaft area by the amount having been shifted.

According to the present invention, as shown by solid line in FIG. 2, since the center of gravity of the head inclines toward the shaft side, when the head is rotated by holding the end of the club shaft, the radius SLAYING of the rotation is smaller than the conventional radius R_0 of the rotation. Moreover due to the increased amount of the shaft side, with use of the sling motion in which the heavier part tends to go forward and the lighter part tends to be pulled backward just before impact, as shown in FIG. 3(b), it is difficult to cause the covering motion apt to take place in the toe side and the draw phenomenon apt to take place in the shaft side, which results in the improvement in the speed of the head upon giving the impact.

In applying the present invention to a metal wood club, the curvatures along the transverse direction and along the longitudinal direction of the face surface are substantially the same. Since the flight direction of the shot golf ball is dominated by both curvatures along the transverse direction and along the longitudinal direction of the face surface of a point where the impact is given, when the curvatures are not the same, the flight direction is not controlled to a desired direction. In the present invention, however, the covering motion of the head at the time of the impact is inhibited by shifting the center of gravity of the head toward the shaft side, resulting in the head face surface is formed by a sphere having substantially the same curvatures along both directions of the face surface, which spherical face is most suitable for giving an impact causing the shot ball controlled. Moreover, since it is difficult to cause the covering motion of the head upon giving an impact, the shot ball tends to direct to the extension of the line connecting the center C of spherical body defining the spherical face and the position where the impact was given, by which superior directional stability of the shot ball is ensured.

In applying the present invention to an iron club, it is preferable to form a back side 122 of a club face part 102 by extending the back side 122 until it passes through the center axis (a) of the hosel part 103 (See FIG. 6), and moreover it is preferable to increase thickness A of the back side 122 by shifting a part of the weight of the toe side B (See FIG. 8).

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Due to this, although the design is out of the conventional common knowledge in the light of the conventional toe-heel balance, the center of gravity is located at, or almost at the intersection point of diagonals passing across the club face part, by which good balance is maintained, return of the toe in hitting a ball is suppressed by 70% and the cause for duffing can be solved (See FIG. 11). Therefore secure down strokes can be ensured. Moreover in light of the design, thickness of a blade can be increased, by which sufficient spinning shot ball can be made.

Further, since the center of gravity is located at, or almost at the intersection point of diagonals passing across the club face part, different from the conventional iron, a toe down phenomenon apt to take place upon giving an impact can be overcome (See FIG. 10) and the weight distribution suitable for the motion going in and out from a heel is completed, resulting in prevention of mistakes caused by duffing.

In the present invention, when the club face part 2 is designed so as to slightly open by about 1.5° against the ball upon addressing, the defect of the conventional club, in which the head easily turns after the impact and therefore golfers are apt to duff (See FIG. 11(a)), can be overcome. Namely, an impact is given in a slightly open position and immediately after this, the position becomes square and then the head turns little by little, which makes the shot ball fly in a high draw trajectory (See FIG. 11(b)).

Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention.

FIG. 1 is a plan view comparing the plane shape of a metal head according to the present invention with that of a conventional metal head.

FIG. 2 is a comparative view showing swing motions of wooden clubs with the metal head according to the present invention and with the conventional metal head.

FIG. 3(a) is an explanatory view showing motion of the conventional metal head before and after an impact.

FIG. 3(b) is an explanatory view showing motion of the metal head according to the present invention before and after an impact.

FIG. 4 is a perspective view showing the idea of designing a face surface of the metal head according to the present invention.

FIG. 5 is a rear view showing a head part of an iron club according to the present invention.

FIG. 6 is a sectional view along line II—II in FIG. 5.

FIG. 7 is a front view showing the club according to the present invention.

FIG. 8 is a rear view showing an iron club according to another example of the present invention.

FIG. 9 is a front view showing a position of the center of gravity according to the weight distribution of the present invention.

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FIG. 10 is a comparative explanatory view showing a toe-down phenomenon in a club according to the present invention (solid line) and in a conventional club.

FIG. 11 is a comparative explanatory view showing a covering motion in an iron club according to the present invention (b) and in a conventional club (a).

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will now be explained in detail, in which the present invention is applied to a metal wood club.

FIG. 1 is a plan view illustrating a projected plane of a metal head according to the present invention, comparing with a conventional metal head. A metal head 1 is a hollow casting, having a spherical face 2 and a hosel part 3 connecting with an unshown shaft. The weight distribution 11 of a toe side is shifted to the back of a shaft side 12 and expanded (See an extent of oblique line). On the whole, the distribution of the amount is not symmetrical, but leans toward the shaft area rather than the toe area. Therefore besides the center of gravity of the head shifts from G0 to the shaft side G1, the distribution of the amount in the shaft side is increased. As a result, the superior weight distribution which, at the moment of giving an impact, suppresses the covering motion in the toe side and the draw phenomenon in the shaft side, can be obtained.

As for the face surface 2, as shown in FIG. 4, the curvature R along the transverse direction and the curvature R along the longitudinal direction are unified and the face 2 surface is so designed that it forms a part of a sphere with radius R round a center C as illustrated. The hosel part 3 obliquely protrudes upward from a position adjacent to the face surface translated in parallel to the center of the sphere. The loft angle of the face surface generally falls on the range from about 9°–12° and both curvatures along the transverse and longitudinal directions of the face are selected from the range from 9–12R so that they are the same. Use of such a golf club makes a golf ball and the face surface collide with each other at the time of impact as if a small ball and a large ball collided with each other and the shot ball is directed to the line extending a radius connecting the spherical center C and the position where the impact was given.

Now the present invention will be explained, in which it is applied to an iron club head.

FIGS. 5 to 7 illustrate an iron golf club according to an example of this invention. A club head 101 is formed by integrally connecting a club face part 102 and a hosel part 103 at a neck part 104. The club head 101 is integrally manufactured with use of an iron material or a copper material by means of forging or casting and polished for finishing.

A fixed hole 130 is formed along the longitudinal direction of the hosel part 103. A shaft 105 is engaged with and fixed to the fixed hole 130 and at the upper side of the shaft, a grip (not shown) is provided.

The club face part 102 comprises a face 120 made open by 1.5° from a square, a sole 121 and a back side 122. As shown in FIG. 5, the back side 122 is formed in such a manner that the back side 122 is extended to a position passing through the center axis (a) of the hosel part 103 and connected to the hosel part 103 through an end surface. The thickness of the back side 122 of the club face part 102, therefore, is increased and compared with the shape of a conventional club head, the neck part is made much smaller. As a result, the weight of the neck part is increased and, as shown in FIG. 9, the center of gravity of the club head is located at or adjacent to an intersection point of diagonals of the face part.

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Accordingly, when a golfer with this club addresses, even though the club face part 102 is placed in a square position, it looks slightly open. The back side 122 of the club face part 102 is extended to a position passing across the center axis (a) of the hosel part 103. The neck part swells and further the center of gravity of the club face part 102 is positioned at the intersection point of the diagonals and slightly inclines toward a heel side to stabilize the club face part 102. When the club is swung under these conditions, it is easy for a golfer to give an impact to a ball in a square position and fly the ball in a straight direction without a hook or a slice. Moreover even when advanced golfers swing downward at a high speed, since good rigidity around the hosel part 103 is given and the center of gravity of the club face part 102 is located at the intersection point of the diagonals so as to slightly incline toward the heel side, a toe-down phenomenon hardly takes place and it results in a smooth impact without duffing.

The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A golf club comprising:

a metallic wood type head having a heel side and a toe side, the mass of the heel side being increased as much as the mass of the toe side of the head is decreased so as to shift the center of gravity of the head toward the heel side, the head having a portion of a surface shaped such that the curvature of the surface approximates the curvature of a sphere, the portion of the surface of the head having substantially the same curvatures along the transverse direction thereof as along a longitudinal direction thereof;

a shaft having an upper end and lower end, the lower end being connected to the head at the heel side; and

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said metallic wood type head further comprising a toe, a heel and a back side profile shape extending from the toe side to the heel side, said back side profile shape between the toe and a most rearwardly point of said metallic wood type head having a radius of curvature that is larger than the radius of curvature of said back side profile shape between the most rearwardly point of said metallic wood type head and the heel.

2. The golf club as claimed in claim 1, wherein the head is a hollow casting with a hosel part to which the shaft is connected.

3. The golf club as claimed in claim 2, wherein the hosel part obliquely protrudes upwardly from a position adjacent a face surface of the head.

4. The golf club as claimed in claim 3, wherein the face surface of the head has a loft angle of 9° to 12°.

5. The golf club as claimed in claim 1, wherein the head has a face surface with a loft angle of 9° to 12°.

6. The golf club as claimed in claim 1, wherein the center of gravity of the head is located approximately in a geometric center of the head.

7. A golf club comprising:

a metallic wood type head including a cylindrical hosel portion formed integrally therewith;

said metallic wood type head having a heel side and a toe side, said metallic wood type head having a hitting surface extending from the toe side to said heel side, the hitting surface having substantially the same curvature along a transverse direction as a longitudinal direction, said metallic wood type head further comprising a toe, a heel, and a back side profile shape extending from the toe side to the heel side, said back side profile shape between the toe and a most rearwardly point of said metallic wood type head having a radius of curvature that is larger than the radius of curvature of said back side profile shape between the most rearwardly point of said metallic wood type head and the heel.

* * * * *

(12) **United States Patent**
Saso

(10) **Patent No.:** **US 6,620,055 B2**
(45) **Date of Patent:** ***Sep. 16, 2003**

(54) **GOLF CLUB**

(75) **Inventor:** **Mitsuhiro Saso, Hyogo (JP)**

(73) **Assignee:** **Saso Golf, Inc., Chicago, IL (US)**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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* cited by examiner

(21) **Appl. No.:** **09/321,572**

(22) **Filed:** **May 28, 1999**

(65) **Prior Publication Data**

US 2003/0092500 A1 May 15, 2003

Related U.S. Application Data

(63) Continuation of application No. 08/888,831, filed on Jul. 7, 1997, now Pat. No. 5,916,043, which is a continuation of application No. 08/479,142, filed on Jun. 7, 1995, now Pat. No. 5,645,495, which is a continuation of application No. 08/321,588, filed on Oct. 11, 1994, now abandoned, which is a continuation of application No. 07/962,586, filed as application No. PCT/JP92/00303 on Mar. 13, 1992, now abandoned.

(30) **Foreign Application Priority Data**

May 1, 1991 (JP) 3-130375
Dec. 21, 1991 (JP) 3-355888

(51) **Int. Cl.⁷** **A63B 53/04**

(52) **U.S. Cl.** **473/324; 473/345; 473/349**

(58) **Field of Search** **473/324, 330, 473/345, 346, 349, 350, 290, 291, 292, 331; D21/733, 759**

(56) **References Cited**

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Primary Examiner—Sebastiano Passaniti

(74) *Attorney, Agent, or Firm*—Ryndak & Suri

(57) **ABSTRACT**

A golf club for improving the flying distance of a ball overcomes toe-down phenomenon due to pulling of the shaft particularly by a skilled player enjoying a high head speed. The golf club further improves the head speed and the directional stability of a hit ball. The golf club has a center of gravity of the head shifted from the toe end of the shaft end by modifying the head shape to decrease the volume of the head by a certain amount at the toe end on the rear side thereof and to increase the head volume at the shaft end on the rear side by an amount equal to the decreased amount. This will reduce the rotational radius of the head about a vertical line, as a rotational center line, when the golf club is suspended at the upper end of the shaft. Furthermore, with a metal wood club, a head is provided with a face which comprises a spherical face formed in such a manner that the curvature in the transverse width direction becomes substantially equal to that in the vertical width direction.

5 Claims, 8 Drawing Sheets

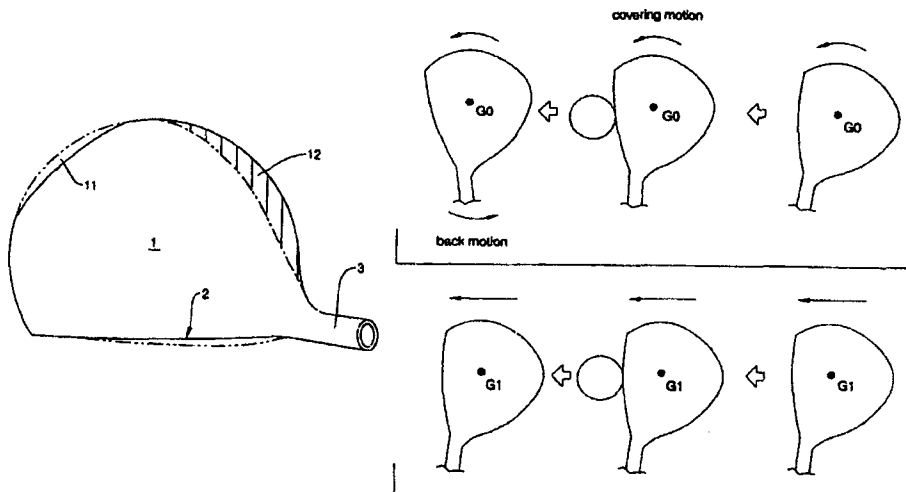


FIG. 1

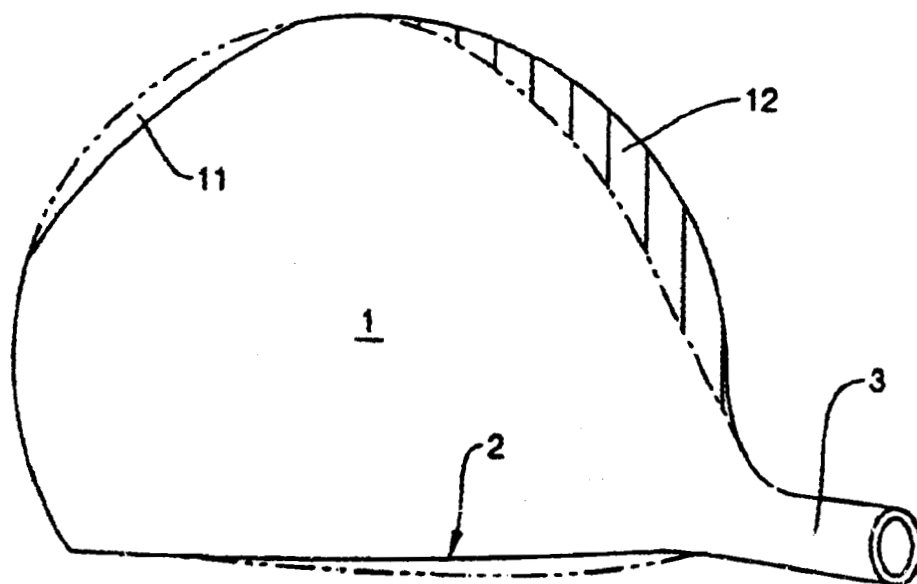


FIG. 2

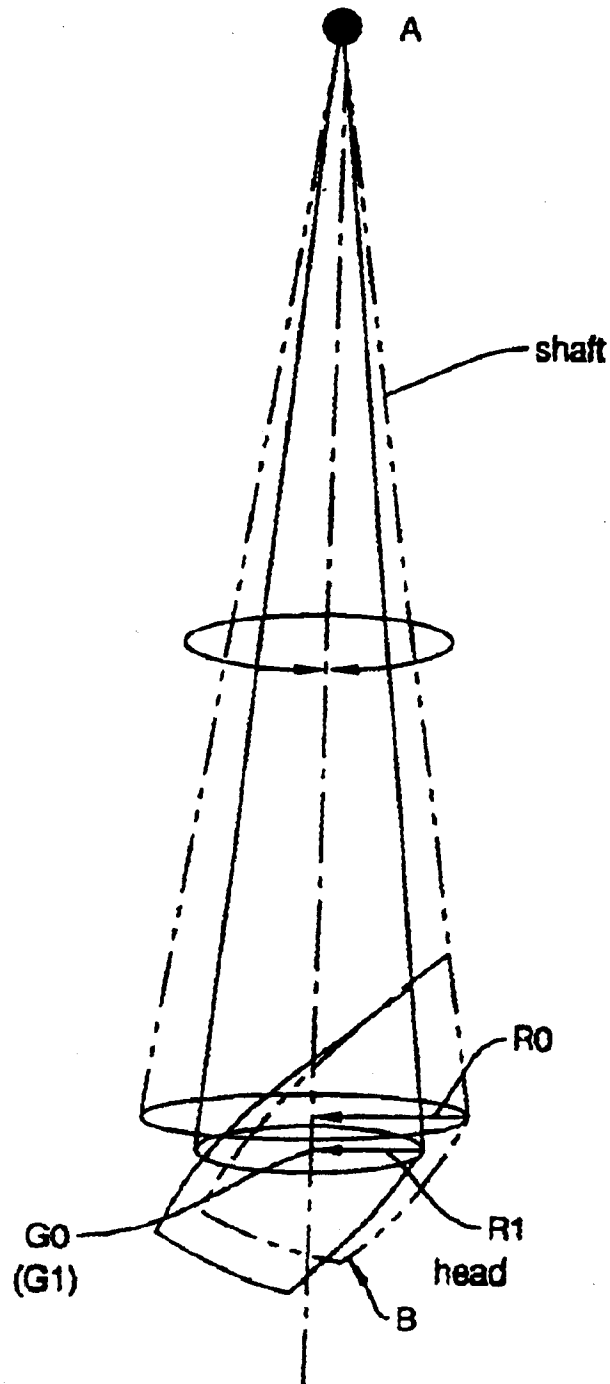


FIG. 3A

covering motion

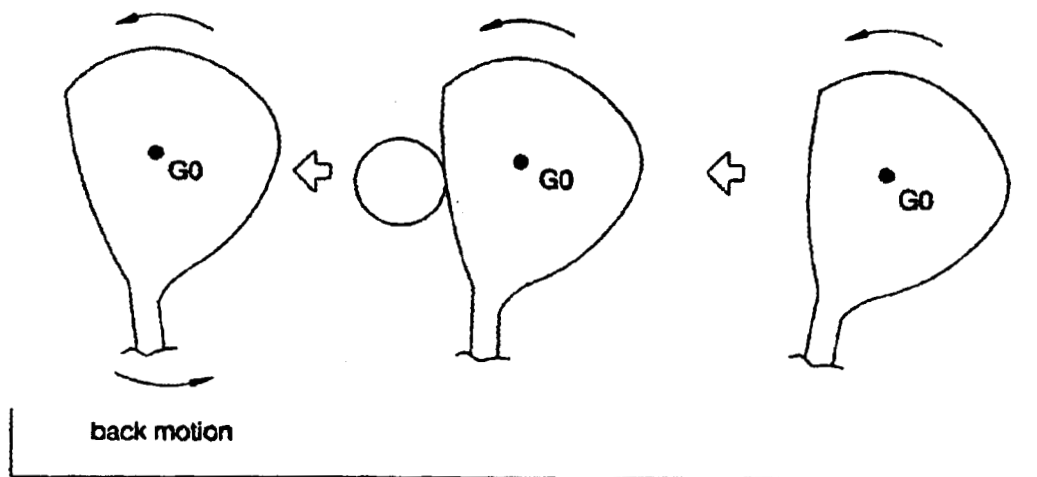


FIG. 3B

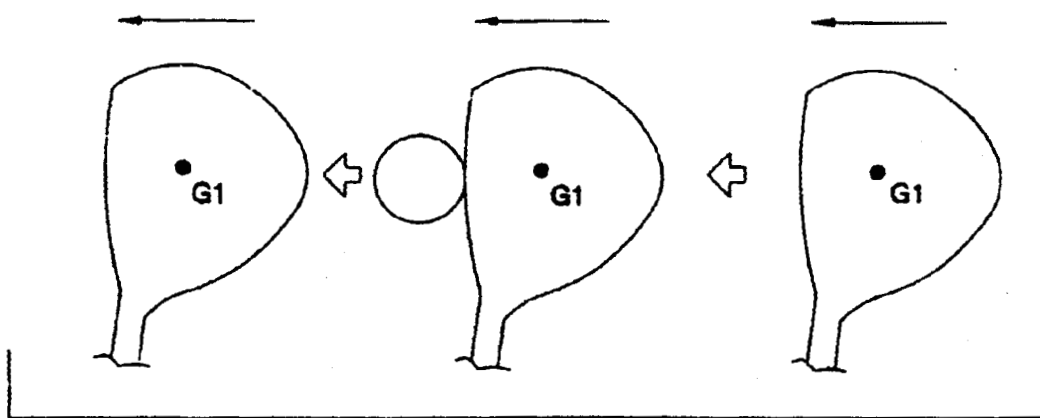


FIG. 4

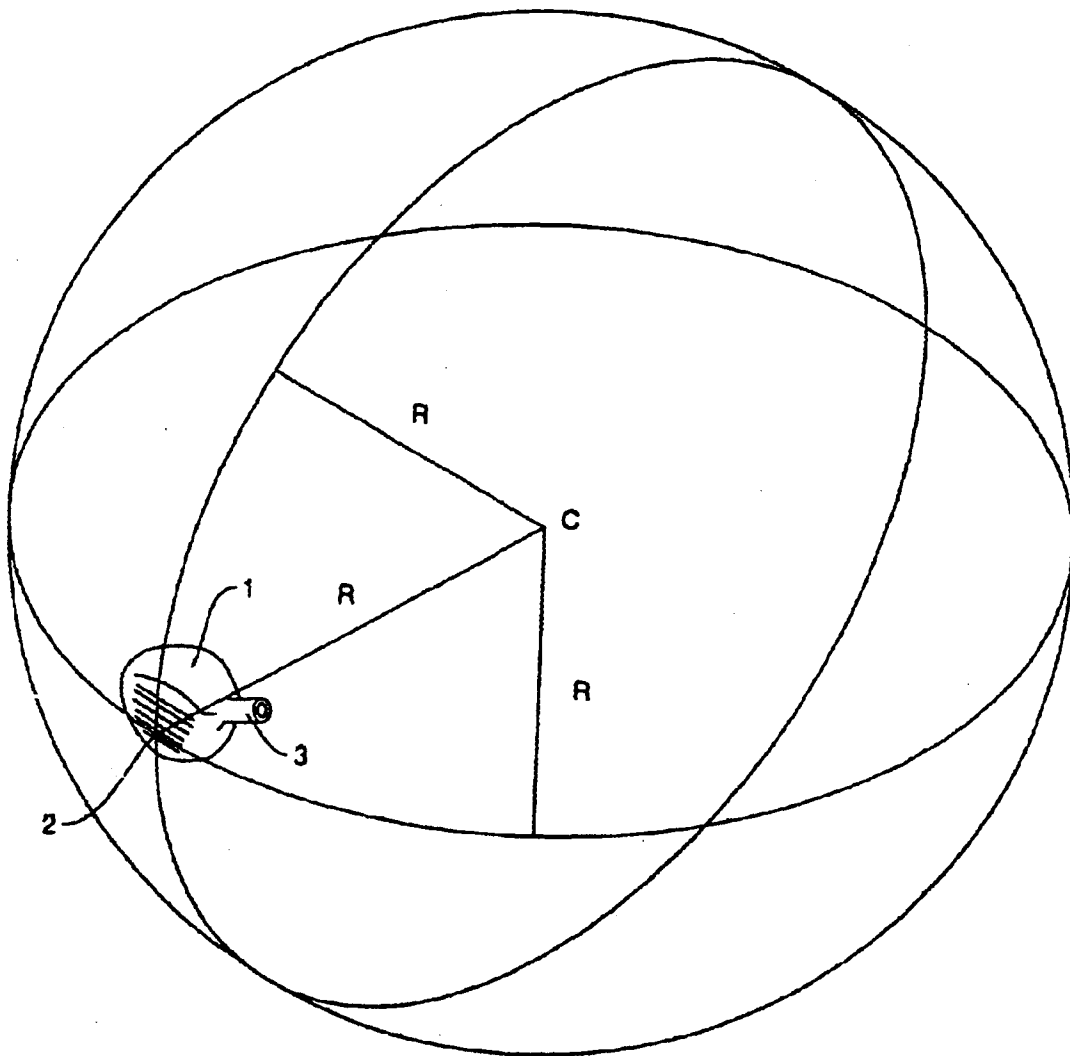


FIG. 5

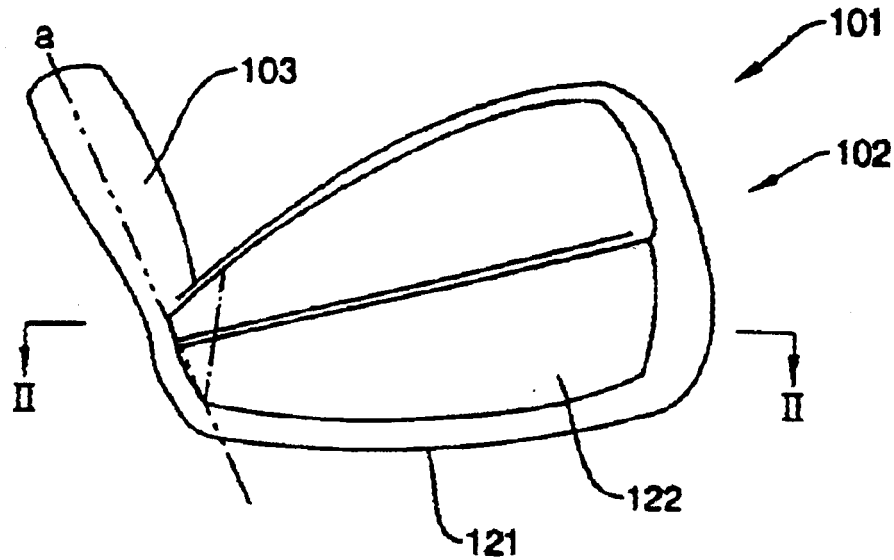


FIG. 6

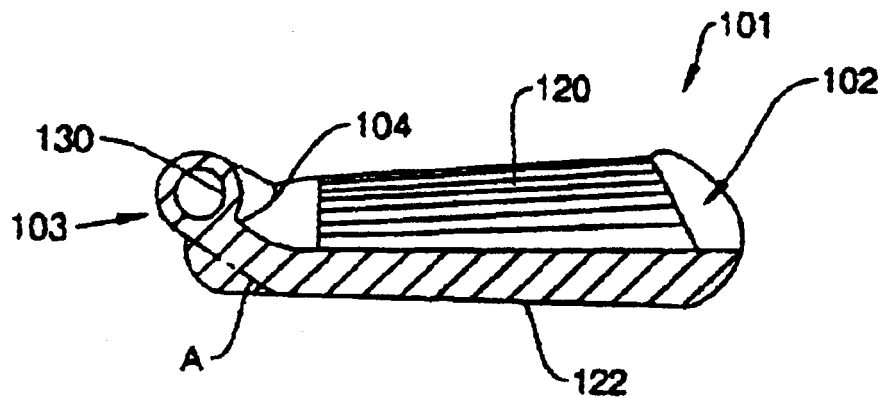
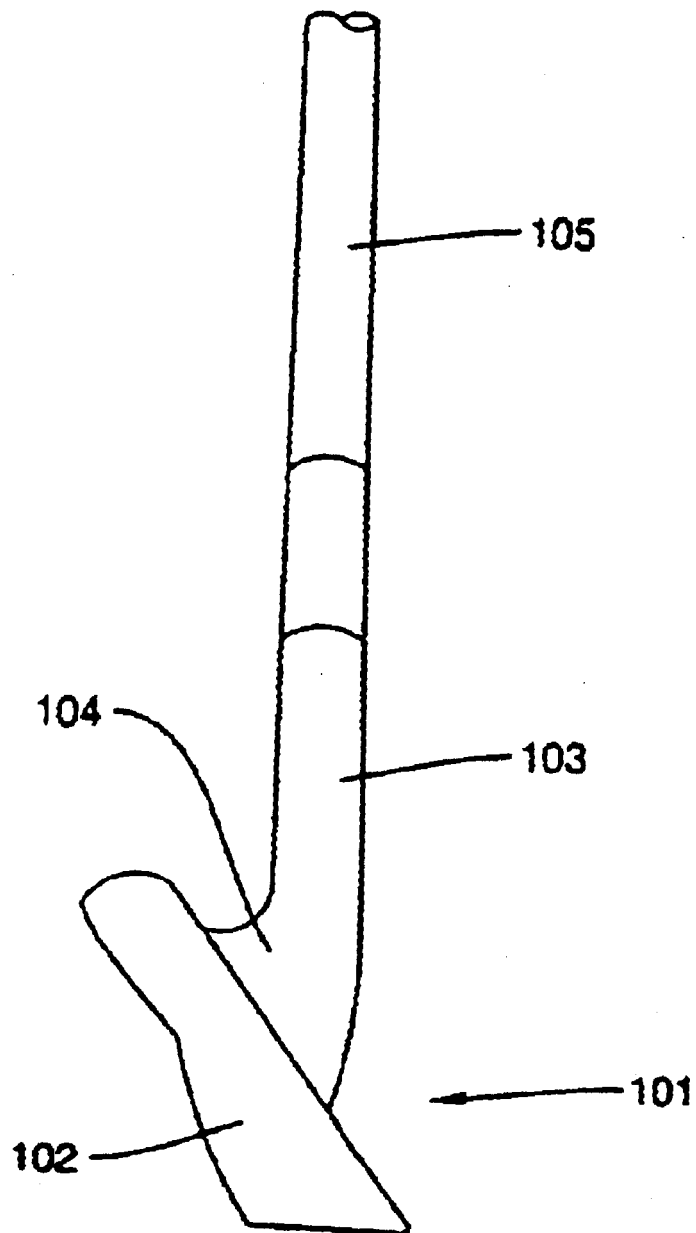


FIG. 7



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FIG. 8

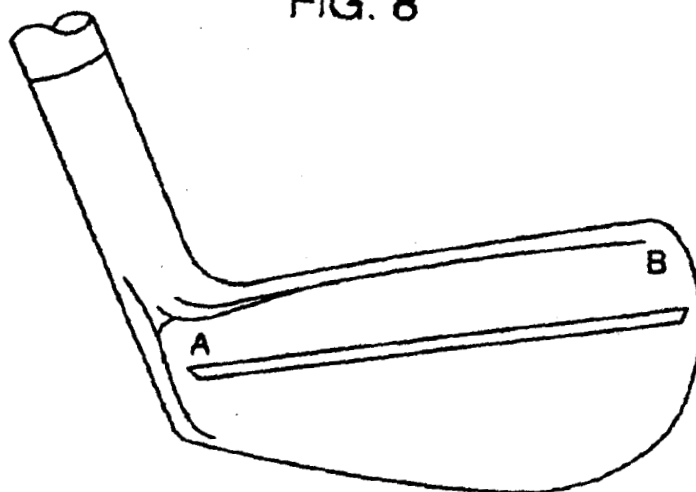


FIG. 9

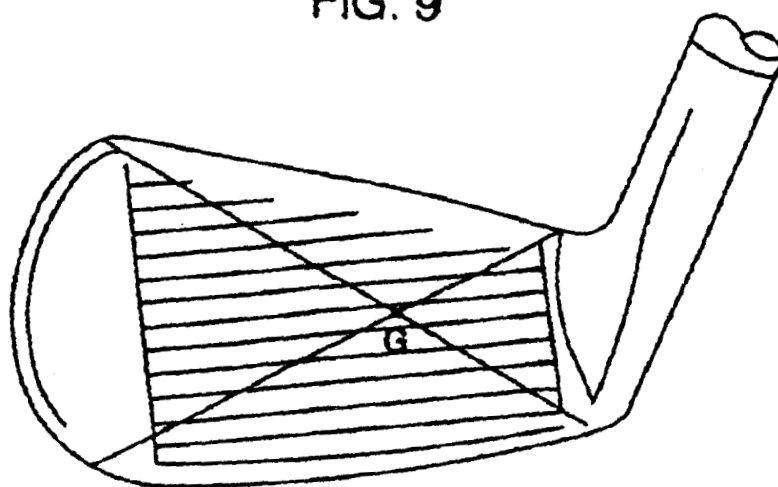


FIG. 10

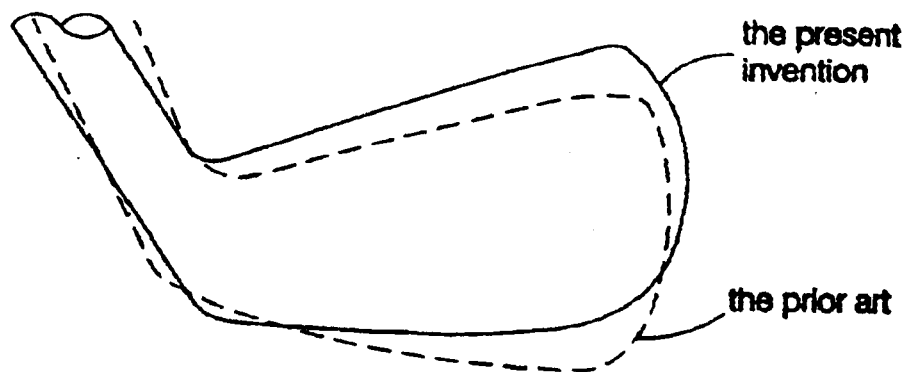


FIG. 11A
the prior art

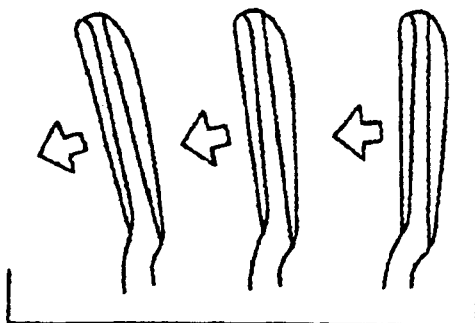
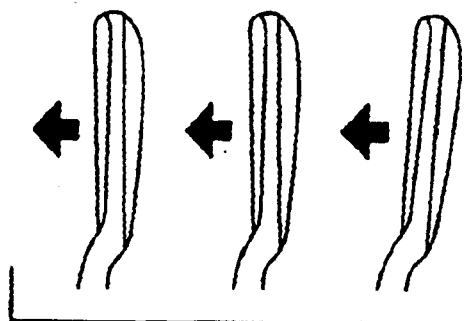


FIG. 11B
the present invention



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GOLF CLUB

This application is a continuation of application Ser. No. 08/888,831 filed on Jul. 7, 1997, now U.S. Pat. No. 5,916,043, which is continuation of application Ser. No. 08/479,142 filed Jun. 7, 1995, now U.S. Pat. No. 5,645,495 issued on Jul. 8, 1997, which is a continuation of application Ser. No. 08/321,588, filed on Oct. 11, 1994, now abandoned, which is a continuation of application Ser. No. 07/962,586 filed Nov. 12, 1992, abandoned as PCT/JP92/00303, Mar. 13, 1992 published as WO92/19327.

TITLE OF THE INVENTION**Golf Club****1. Field of the Invention**

The present invention relates to a golf club by which the directional stability and flight distance of a shot ball can be improved.

2. Prior Art

In a conventional wooden club, as well as to a metal wood club, a head is in such a shape that, as shown by two dashed line in FIG. 1, it gradually expands from a shaft side to a toe side. The center of gravity of the head is set at a position inclined toward the toe side rather than the center of the projection plane of the head, thereby the head speed of the golf club may be increased at the time of impacting on the ball.

Also in a conventional golf club of an iron type, according to the similar theory, an end of the back side of a club face part is, when seen from a plane, smoothly connected to the hosel, through a neck part, forming a curve (See dashed line A in FIG. 6) and thus the center of gravity of the club is set at a position slightly inclined toward a toe side.

However, when the center of gravity of the head inclines toward the toe side, as shown by two dashed line in FIG. 2, and when the head B is rotated with holding an end A of the club shaft, a radius R0 of the rotation, with its center line of the rotation positioned at the vertical line made by suspending an upper end of the shaft, increases. Therefore, the metal wood club and the iron club, as shown in FIGS. 3(a) and 11(a), respectively, are apt to cause covering motion (which means the phenomenon that the toe side goes fast than the shaft side as if the toe side rotates around the shaft side) at each head toe side just before impacting.

For the purpose of inhibiting a hook flying of the shot ball, caused by the covering motion, in the metal wood club, as shown by two dashed line in FIG. 1, a head face surface usually has such a shape that the shaft side expands slightly more forward than the toe side. Accordingly, curvature along the transverse direction of the face surface and curvature along longitudinal direction of the face surface are not the same; usually curvature along longitudinal direction is larger than that along the transverse direction.

On the other hand, as shown in FIG. 10, the covering motion is not the only problem in the iron club; that is, the center of gravity of the iron club slightly inclines toward the toe side in the club face part, therefore for advanced golfers whose down swings are faster than those of beginners, a toe down phenomenon, in which the neck part is twisted downwardly by an accelerated motion applied to the head and thus the toe side of the club face part tends to be lowered, resulting in duff shot.

Accordingly, for the purpose of overcoming the defects of the conventional club head, the inventor, as a result of his sharp research, has converted the basic concept of designing

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the club head to a new one in order to provide a golf club head by which improvement in the directional stability and flight distance of the shot ball can be realized. That is the object of the present invention.

The present invention has been completed on the inventive concept found by us that due to the property of the sling motion of the club head round the gravity center thereof, in which a heavier part goes forward and a lighter part does not catch up with the heavier part in a manner that the heavier part and the lighter part rotate around the gravity center axis, the conventional club head is subjected not only to the above-mentioned covering movement but also to a pull-back phenomenon in the shaft side as a reaction of the covering movement, accordingly resulting in substantial decrease of the speed of the head. The present invention is, therefore, to provide a golf club which head is formed in such a manner that the amount of a shaft side is increased as much as the amount of a head toe side is decreased so as to shift the center of gravity of the head toward the shaft side and a radius of a rotation, with its center line of the rotation positioned at a vertical line made by suspending an upper end of a shaft, is decreased.

Mere shift of the center of gravity of the head toward the shaft side is not enough to overcome the covering motion of the head; at the same time, the weight balance of the head must be maintained. Therefore, it is advantageous to increase the amount of the shaft side in the head as much as that of the toe side decreases so as to maintain the weight balance of the head. Due to this, the center of gravity of the head usually inclines toward the shaft area by the amount having been shifted.

According to the present invention, as shown by solid line in FIG. 2, since the center of gravity of the head inclines toward the shaft side, when the head is rotated by holding the end of the club shaft, the radius SLAYING of the rotation is smaller than the conventional radius R0 of the rotation. Moreover due to the increased amount of the shaft side, with use of the sling motion in which the heavier part tends to go forward and the lighter part tends to be pulled backward just before impact, as shown in FIG. 3(b), it is difficult to cause the covering motion apt to take place in the toe side and the draw phenomenon apt to take place in the shaft side, which results in the improvement in the speed of the head upon giving the impact.

In applying the present invention to a metal wood club, the curvatures along the transverse direction and along the longitudinal direction of the face surface are substantially the same. Since the flight direction of the shot golf ball is dominated by both curvatures along the transverse direction and along the longitudinal direction of the face surface of a point where the impact is given, when the curvatures are not the same, the flight direction is not controlled to a desired direction. In the present invention, however, the covering motion of the head at the time of the impact is inhibited by shifting the center of gravity of the head toward the shaft side, resulting in that the head face surface is formed by a sphere having substantially the same curvatures along both directions of the face surface, which spherical face is most suitable for giving an impact causing the shot ball controlled. Moreover, since it is difficult to cause the covering motion of the head upon giving an impact, the shot ball tends to direct to the extension of the line connecting the center C of spherical body defining the spherical face and the position where the impact was given, by which superior directional stability of the shot ball is ensured.

In applying the present invention to an iron club, it is preferable to form a back side 122 of a club face part 102 by

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extending the back side 122 until it passes through the center axis (a) of the hosel part 103 (See FIG. 6), and moreover it is preferable to increase thickness A of the back side 122 of a neck part 4 by shifting a part of the weight of the toe side B (See FIG. 8). Due to this, although the design is out of the conventional common knowledge in the light of the conventional toe-heel balance, the center of gravity is located at, or almost at the intersection point of diagonals passing across the club face part, by which good balance is maintained, return of the toe in hitting a ball is suppressed by 70% and the cause for duffing can be solved (See FIG. 11). Therefore secure down strokes can be ensured. Moreover in the light of the design, thickness of a blade can be increased, by which sufficient Spinning shot ball can be made.

Further, since the center of gravity is located at, or almost at the intersection point of diagonals passing across the club face part, different from the conventional iron, a toe down phenomenon apt to take place upon giving an impact can be overcome (See FIG. 10) and the weight distribution suitable for the motion going in and out from a heel is completed, resulting in prevention of mistakes caused by duffing.

In the present invention, when the club face part 2 is designed so as to slightly open by about 1.5° against the ball upon addressing, the defect of the conventional club, in which the head easily turns after the impact and therefore golfers are apt to duff (See FIG. 11(a)), can be overcome. Namely, an impact is given in a slightly open position and immediately after this, the position becomes square and then the head turns little by little, which makes the shot ball to fly in a high draw trajectory (See FIG. 11(b)).

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plane view comparing the plane shape of a metal head according to the present invention with that of a conventional metal head.

FIG. 2 is a comparative view showing swing motions of wooden clubs with the metal head according to the present invention and with the conventional metal head.

FIG. 3(a) is an explanatory view showing motion of the conventional metal head before and after an impact.

FIG. 3(b) is an explanatory view showing motion of the metal head according to the present invention before and after an impact.

FIG. 4 is a perspective view showing the idea of designing a face surface of the metal head according to the present invention.

FIG. 5 is a rear view showing a head part of an iron club according to the present invention.

FIG. 6 is a sectional view along—line in FIG. 5.

FIG. 7 is a schematical perspective view showing the club according to the present invention.

FIG. 8 is a rear view showing an iron club according to another example of the present invention.

FIG. 9 is a front view showing a position of the center of gravity according to the weight distribution of the present invention.

FIG. 10 is a comparative explanatory view showing a toe-down phenomenon in a club according to the present invention (solid line) and in a conventional club.

FIG. 11 is a comparative explanatory view showing a covering motion in an iron club according to the present invention (a) and in a conventional club (b).

PREFERRED EMBODIMENT

The present invention will now be explained in detail, in which the present invention is applied to a metal wood club.

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FIG. 1 is a plane view illustrating a projected plane of a metal head according to the present invention, comparing with a conventional metal head. A metal head 1 is a hollow casting, having a spherical face 2 and a hosel part 3 connecting with an unshown shaft. The weight distribution 11 of a toe side is shifted to the back of a shaft side 12 and expanded (See an extent of oblique line). On the whole, the distribution of the amount is not symmetrical, but leans toward the shaft area rather than the toe area. Therefore besides the center of gravity of the head shifts from G0 to the shaft side G1, the distribution of the amount in the shaft side is increased. As a result, the superior weight distribution which, at the moment of giving an impact, suppresses the covering motion in the toe side and the draw phenomenon in the shaft side, can be obtained.

As for the face surface 2, as shown in FIG. 4, the curvature R along the transverse direction and the curvature R along the longitudinal direction are unified and the face 2 surface is so designed that it forms a part of a sphere with radius R round a center C as illustrated. The hosel part 103 obliquely protrudes upward from a position adjacent to the face surface translated in parallel to the center of the sphere. The loft angle of the face surface generally falls on the range from about 90°–120° and both curvatures along the transverse and longitudinal directions of the face are selected from the range from 9–12R so that they are the same. Use of such a golf club makes a golf ball and the face surface collide with each other at the time of impact as if a small ball and a large ball collided with each other and the shot ball is directed to the line extending a radius connecting the spherical center C and the position where the impact was given.

Now the present invention will be explained, in which it is applied to an iron club head.

FIGS. 4 to 7 illustrate an iron golf club according to an example of this invention. A club head 101 is formed by integrally connecting a club face part 102 and a hosel part 103 at a neck part 104. The club head 101 is integrally manufactured with use of an iron material or a copper material by means of forging or casting and polished for finishing.

A fixed hole 130 is formed along the longitudinal direction of the hosel part 103. A shaft 105 is engaged with and fixed to the fixed hole 130 and at the upper side of the shaft, a grip (not shown) is provided.

The club face part 102 comprises a face 120 made open by 1.5° from a square, a sole 121 and a back side 122. As shown in FIG. 5, the back side 122 is formed in such a manner that the back side 122 is extended to a position passing through the center axis (a) of the hosel part 103 and connected to the hosel part 103 through an end surface. The thickness of the back side 122 of the club face part 102, therefore, is increased and compared with the shape of a conventional club head, the neck part is made much smaller. As a result, the weight of the neck part is increased and, as shown in FIG. 9, the center of gravity of the club head is located at or adjacent to an intersection point of diagonals of the face part.

Accordingly, when a golfer with this club addresses, even though the club face part 102 is placed in a square position, it looks slightly open. The back side 122 of the club face part 102 is extended to a position passing across the center axis (a) of the hosel part 103. The neck part swells and further the center of gravity of the club face part 102 is positioned at the intersection point of the diagonals and slightly inclines toward a heel side to stabilize the club face part 102. When the club is swung under these conditions, it is easy for a

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golfer to give an impact to a ball in a square position and fly the ball in a straight direction without a hook or a slice. Moreover even when advanced golfers swing downward at a high speed, since good rigidity around the hosel part 103 is given and the center of gravity of the club face part 102 is located at the intersection point of the diagonals so as to slightly incline toward the heel side, a toe-down phenomenon hardly takes place and it results in a smooth impact without duffing.

What is claimed is:

1. A golf club comprising:

a metallic wood type head having a heel side and a toe side;

a shaft having an upper end and lower end, the lower end being connected to the head at the heel side; and

said metallic wood type head further comprising a toe, a heel and a back side profile shape extending from the toe side to the heel side, said back side profile shape between the toe side and a most rearwardly point of said metallic wood type head having a radius of curvature that is larger than the radius of curvature of said back side profile between the most rearwardly point of said metallic wood type head and the heel side.

2. A golf club as defined in claim 1, wherein the head has a portion of a surface shaped such that the curvature of the

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surface substantially approximates the curvature of a sphere for striking a golf ball.

3. A golf club as defined in claim 2, wherein the portion of the surface of the head has substantially the same curvatures along the transverse direction thereof as along a longitudinal direction thereof.

4. A method of striking a golf ball comprising:

(a) swinging the golf club in a golf swing, the golf club comprising a golf shaft having an upper end and a lower end, and the head having a toe, a heel and a back side profile shape extending from the toe side to the heel side, the back side profile shape between the toe and a most rearwardly point of the head having a radius of curvature that is larger than the radius of curvature of the back side profile shape between the most rearwardly point of the head and the heel; and

(b) striking the golf ball with the golf ball striking face of the golf club during the golf swing.

5. The method of claim 4 wherein the head further comprises a ball striking face with a longitudinal extent and a transverse extent, the face having a spherical ball striking surface that approximates the curvature of a sphere, the spherical surface having substantially the same curvature in the transverse direction as in the longitudinal direction.

* * * * *

August 14, 2006

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Dear Julianne Davis Esq.

This is a response to your letter of June 30, 2006. We are contacting US patent attorneys in order to have a severe and fair-minded comment on your opinion. However, it is now a hot summer season where everybody would like to have a long summer vacation. Therefore, this response will be made just by us from the reasonable view of the skilled persons in the gold designing art and with reference to the judge comment of settlement in the US case.

NOTE:

1. Literal infringement

In the Claim 1 of USP No. 5,645,495, our claimed metallic wood type head further comprises a toe, a heel and a back side profile shape extending from the toe side to the heel side, said back side profile shape between the toe and a most rearwardly point of said metallic wood type head having a radius of curvature that is larger than the radius curvature of said back side profile shape between the most rearwardly point of said metallic wood type head and the heel.

When the back side profile shape is designed, 1) firstly the skilled persons compares the toe side back side profile between the toe and a most rearwardly point of said metallic wood type head with the heel side back side profile between the most rearwardly points of said metallic wood type head and the heel in order to maintain the weight balance of the head from the symmetrical view at the center point (the most rearwardly point) of the back side profile shape and 2) secondarily the mass of the heel

side is increased as much as the mass of the toe side is decreased so as to shift the center of gravity of the head toward the heel side by the above claimed designing pattern of the back side profile shape.

According to the technical sense of the skilled persons in the golf designing art, it is general that a radius of curvature on one or more points selected between the toe and a most rearwardly point of said metallic wood type head should be compared with the corresponding radius of curvature on the point symmetrically selected from the most rearwardly point between the most rearwardly points of said metallic wood type head and the heel.

Further, according to the common sense of the skilled persons in the golf designing art, the wording of "curvature" means the state of being curved, so that when the skilled persons discuss the curvature of the profile on designing the profile, it is also general for the profile to be discussed to have a plural of curvature because a single curvature means "circle" so that the curvature of circle must not be an issue to be discussed on designing.

Furthermore, there was no discussions and no judge comments concerning the wording of the radius of curvature in the past settlement.

Therefore, taking the above understanding of the radius of curvature into consideration, we do not believe that your claim interpretation is reasonable.

2. Prior Art

The same references as you appointed were already submitted to the Judge in the settled case and already judged that all the references are not prior art against the Saso invention because any references do not show any shifting technology of the center gravity of head toward the heel side in the metallic wood type head.

3. Meeting

We have the corresponding patents in Japan, Korea and Europe as well as USA. Therefore, if Nike has not an intention to have a meeting for a license or if our licensee wants to file an injunction law suit against your company in Japan and Korea, we have to file firstly each preliminary injunction law suits at least in Korea and Japan respectively because we already start another licensing meeting with one of your competitors and also since we still believe that each of your new products: NIKE SasQuatch + 460 Drivers, NIKE SasQuatch Tour 460 Driver, and NIKE SasQuatch Fairway Woods is made by using the first Saso theory and belonging to the claim scopes of USP No. 5,645,495 and No.6,620,055. Please note that the corresponding Europe,

Japan and Korea patents have claims which scopes are broader than US one.

Under the situation, you are requested to send us your fair-minded answer at latest before the end of August. If we have not any answer from you or Nike, we have to file a lawsuit against Nike at Osaka District Court on the beginning of the coming September.

Sincerely yours

A handwritten signature in black ink, appearing to read 'Hisao Ishii', is written over a horizontal line.

Hisao ISHII

Japanese patent attorney representative of Mr. Mituhiro Saso