

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte TOSHIO CHIKARAISHI

Appeal No. 2003-1610
Application No. 09/715,128

ON BRIEF

Before STAAB, McQUADE, and NASE, Administrative Patent Judges.
NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 3 to 10, which are all of the claims pending in this application.

We REVERSE.

BACKGROUND

The appellant's invention relates to the characteristic and structure of a face of a wood club head (specification, p. 1). An object of the present invention is to provide a wood golf club head that exhibits sufficiently the repulsion of the face while meeting the golf rules and securing the durability of the face. The appellant's wood golf club head as shown in Figure 1 is a metal hollow shell structure having a double face 2 made up of a front face 4 with a thickness t_1 and a rear face 5 with a thickness t_2 defining an air gap 6 of a prescribed width d . When a ball is made to collide with the front face 4 at an incoming speed (head speed) of V (m/s), the repulsion factor of the face is 0.84 to 0.88 when the incoming speed (head speed) V is 35 to 40 (m/s), and is from 0.80 to less than 0.83 when the incoming speed V is 48 to 53 (m/s). The front face is thinner than the rear face and has a thickness t_1 of from 1.3 mm to less than 2.0 mm. The rear face has a thickness t_2 in a range of 1.5 mm to 2.3 mm. The air gap width d is in the range of 0.2 mm to 1.0 mm. A copy of the claims under appeal is set forth in the appendix to the appellant's brief.

Claims 3 to 10 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,165,081¹ to Chou.

¹ Issued December 26, 2000.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejection, we make reference to the answer (Paper No. 11, mailed November 15, 2002) for the examiner's complete reasoning in support of the rejection, and to the brief (Paper No. 10, filed October 15, 2002) and reply brief (Paper No. 13, filed January 15, 2003) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. Upon evaluation of all the evidence before us, it is our conclusion that the evidence adduced by the examiner is insufficient to establish a prima facie case of obviousness with respect to the claims under appeal. Accordingly, we will not sustain the examiner's rejection of claims 3 to 10 under 35 U.S.C. § 103. Our reasoning for this determination follows.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is established by presenting evidence that would have led one of ordinary skill in the art to

arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Claims 3 and 5, the only independent claims on appeal, read as follows:

3. A wood club head comprising:
a head main body defining a hollow portion, the head main body including a front face forming a hitting face and a rear face disposed behind the front face so as to form a gap of a predetermined width between the front face and the rear face, the rear face having a thickness in a range of 1.5 mm to 2.3 mm,
wherein, when a golf ball is made to collide on the front face at an entrance speed V (m/s), a restitution coefficient of the front face is in a range of from 0.84 to 0.88 in a case where the entrance speed V is in a range of from 35 to 40 (m/s).

5. A wood club head comprising:
a head main body defining a hollow portion, the head main body including a front face forming a hitting face and a rear face disposed behind the front face so as to form a gap of a predetermined width, the rear face having a thickness in a range of 1.5 mm to 2.3 mm,
wherein, when a golf ball is made to collide on the front face at an entrance speed V (m/s), a restitution coefficient of the front face is not lower than 0.80 but lower than 0.83 in a case where the entrance speed V is in a range of from 48 to 53 (m/s).

Chou's invention relates, in general, to a golf club and, more specifically, to a golf club head for controlling launch velocity of a golf ball. Chou's invention provides a golf club head having a stopper plate disposed at a front end. A trampoline plate is disposed a predetermined distance forwardly of the stopper plate for forming a gap in

between. The trampoline plate deflects in a direction toward the stopper plate and rebounds in a direction away from the stopper plate when impacting a golf ball. The stopper plate arrests the deflection of the trampoline plate when striking a golf ball with a first impact velocity. The trampoline plate deflects freely when striking the golf ball with a second impact velocity. The second impact velocity is lower than the first impact velocity.

Chou teaches (column 2, line 66, to column 4, line 27) that:

The invention allows the mechanical properties of the striking face of a golf club to be controlled and varied. In an exemplary embodiment, control of the striking face is varied so that it does not violate the USGA maximum launch velocity. An exemplary embodiment of the invention will be described using the USGA requirement.

Use of the invention provides a coefficient of restitution of 0.83 to the golf club when impacting a ball at 160 ft/sec, hence satisfying current USGA regulations. With a lower impact velocity, however, which is consistent with a nonprofessional player, the club head provides a coefficient of restitution that is higher than that of a conventional club head and higher than 0.83. The invention includes a club head that has two plates separated by a gap space, as shown in FIG. 1. As shown, trampoline plate 16 is disposed at the hitting or striking side of a golf club head. The body of the golf club head is generally identified as 10 and has a hosel 12 projecting upwardly from the top wall of the club head in a conventional manner. The trampoline plate 16 has a striking surface for hitting a golf ball 20. As will be described more fully, the thickness, shape and resiliency of trampoline plate 16 may be varied, depending on use of the club and on the resiliency and hardness of its material.

Disposed rearwardly of trampoline plate 16 is stopper plate 14. Trampoline plate 16 and stopper plate 14 are separated by gap 18. Stopper plate 14 is stiff and arrests the deflection of the trampoline plate. In this manner, the club head may provide a coefficient of restitution of 0.83 when impacting a

ball at 160 ft/sec. Under moderate impact speed (lower than 160 ft/sec), which is consistent with the nonprofessional golfer, trampoline plate 16 deflects freely and produces a ball launch velocity higher than a conventional club head that experiences little or no trampoline effect. When the impact speed is high in the hands of a professional player, however, the trampoline plate's deflection is arrested by the stopper plate. Consequently, the maximum launch velocity and the coefficient of restitution remains within USGA regulation limits. The invention thus allows the trampoline effect to increase the ball launch velocity for the average golfer, but does not help the professional golfer, all within the USGA regulations.

Referring now to FIGS. 1-3, trampoline plate 16 is shown in three different positions. Just prior to striking ball 20, trampoline plate 16 is at a rest position and is spaced from stopper plate 14 by a predetermined width or gap 18. At moderate impact speed, the trampoline plate deflects freely, as shown in FIG. 2. That is, upon striking the ball (not shown) trampoline plate 16 deforms and deflects inwardly into gap 18. Due to resiliency, trampoline plate 16 rebounds to give the ball a higher launch velocity. The stopper plate is inactive during moderate impact speed, and behaves transparently to the spring-like action of the trampoline plate. At the USGA specified high impact speed of 160 ft/sec, however, the deflection of the trampoline plate is arrested by the stopper plate, as shown in FIG. 3.

More specifically, the stopper plate is inactive at impact velocities below 120-140 ft/sec. At impact velocities of 120-140 ft/sec the gap width is such that upon deflection the trampoline plate just touches the stopper plate. At impact velocities greater than 120-140 ft/sec, particularly at 160 ft/sec, the stopper plate arrests any further deflection of the trampoline plate.

The trampoline effect is dependent on the characteristics of the trampoline plate. Depending on the materials used, the effect is usually more pronounced if the plate is thin. Compared to a thick trampoline plate, a thin plate deflects more during ball impact, and rebounds more to give the ball a higher launch velocity. The energy loss during impact is mostly in the ball, due to the viscosity and large deformation of the ball. In order to reduce energy loss, deformation of the ball may be reduced. This is achievable by increasing the deformation of the trampoline plate which, in turn, results in reducing the deformation of the ball. Higher deformation, or deflection, in the trampoline plate may be achieved by using a thin plate with materials having low stiffness (Young's modulus) and high strength. Materials that have these properties

include titanium, a new alloy and glass or graphite reinforced composite materials.

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As mentioned, the invention includes maximizing the launch velocity of the ball while staying within the prescribed rules of the USGA.

The invention satisfies the USGA rule at high impact velocity of 160 ft/sec, but gives a higher coefficient of restitution than a conventional club head at lower velocity.

Chou discloses (column 5, line 20, to column 6, line 22) a wood club head having (1) a titanium trampoline plate 16 having a thickness of 0.10 inch; (2) a titanium stopper plate 34 having a thickness of 0.15 inch; and (3) an air gap between the two plates of 1.9 mm. Chou teaches that the stopper plate 34 is of sufficient thickness to form a rigid and stiff wall for arresting the deformation of the trampoline plate and that other materials and thicknesses may be selected for the stopper plate, the prime consideration being to achieve a stopper plate that is stiff and rigid.

The appellant argues throughout both briefs that the claimed thickness of the rear face (i.e., a thickness in a range of 1.5 mm to 2.3 mm) is not taught or suggested by Chou. We agree. Chou specifically teaches a preferred thickness of 0.15 inch (3.81 mm) for the stopper plate 34 (i.e., rear face). While Chou does teach that other materials and thicknesses may be selected for the stopper plate, we fail to find any

teaching or suggestion within Chou for a person of ordinary skill in the art at the time the invention was made to have drastically reduce the preferred thickness of 0.15 inch (3.81 mm) for the stopper plate 34 to be within the claimed range of 1.5 mm to 2.3 mm.

Moreover, in the rejection before us in this appeal (answer, pp. 3-5), the examiner never found that it would have been obvious at the time the invention was made to a person of ordinary skill in the art to have modified Chou's stopper plate 34 to be within the claimed range of 1.5 mm to 2.3 mm. Instead, the examiner found only that it would have been obvious to have modified Chou's stopper plate 34 to have a thickness other than that explicitly cited in the patent (i.e., 0.15 inch). While the examiner's determination is correct, this does not necessarily result in or render obvious the claimed thickness range of the rear face (i.e., 1.5 mm to 2.3 mm).

Since the examiner has failed to establish a prima facie case of obviousness with respect to the claims under appeal for the reasons set forth above, the decision of the examiner to reject claims 3 to 10 under 35 U.S.C. § 103 is reversed.

CONCLUSION

To summarize, the decision of the examiner to reject claims 3 to 10 under 35 U.S.C. § 103 is reversed.

REVERSED

LAWRENCE J. STAAB
Administrative Patent Judge

JOHN P. McQUADE
Administrative Patent Judge

JEFFREY V. NASE
Administrative Patent Judge

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