

[54] **FORCE FOCUSING GOLF CLUB**
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 abandoned.

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[51] Int. Cl. **A63b 53/04**

[58] Field of Search... **273/77 R, 78, 81 R, 167-175**

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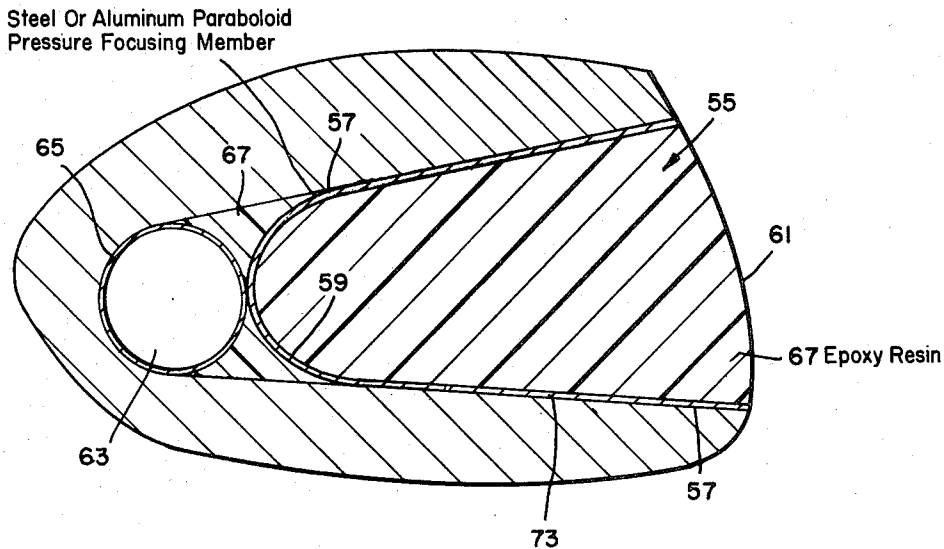
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[57] **ABSTRACT**

This is a golf club comprising a head and attached shaft wherein a pressure focusing means, such as a metal paraboloid reflector, is disposed in a filled recess to reflect shock waves caused by a golf ball impacting on the impact face of the head. The head may also include a gas-filled chamber adjacent to the side of the reflector opposite the impact face.

3 Claims, 5 Drawing Figures



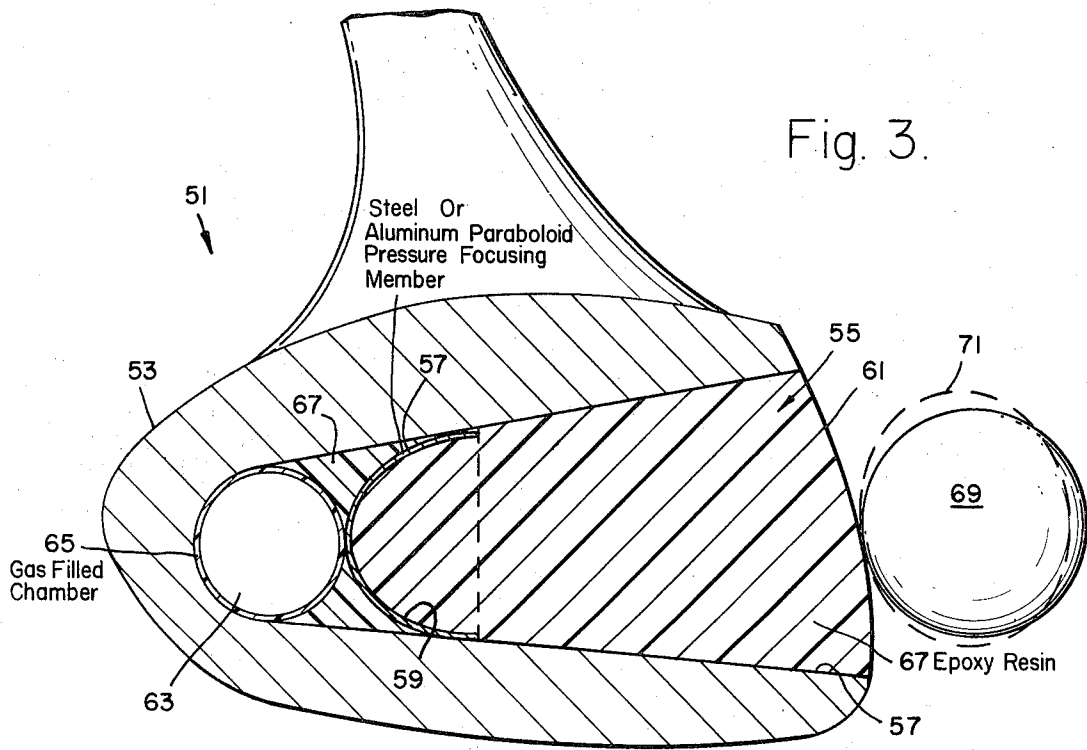


Fig. 3.

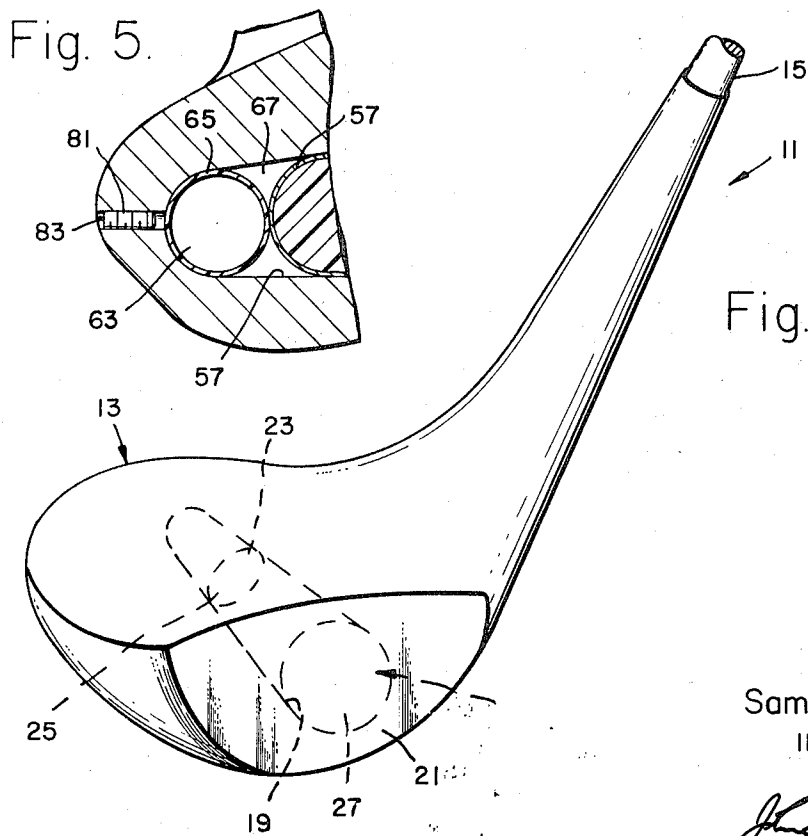


Fig. 1.

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Fig. 2.

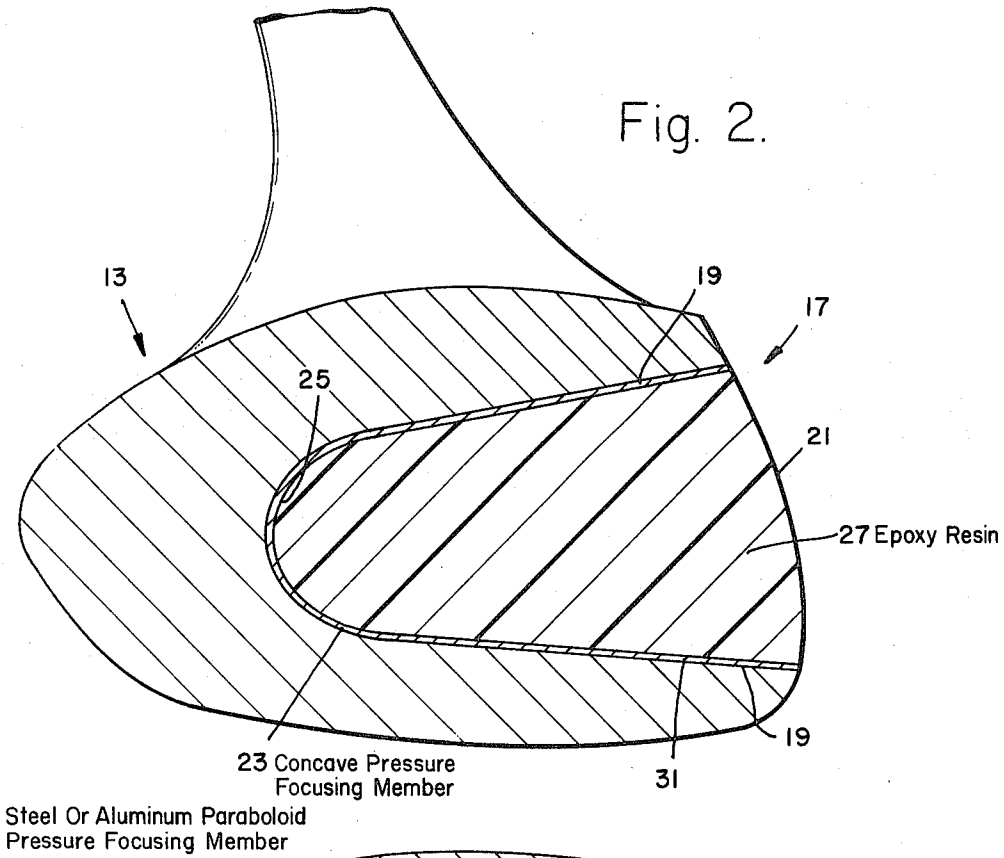
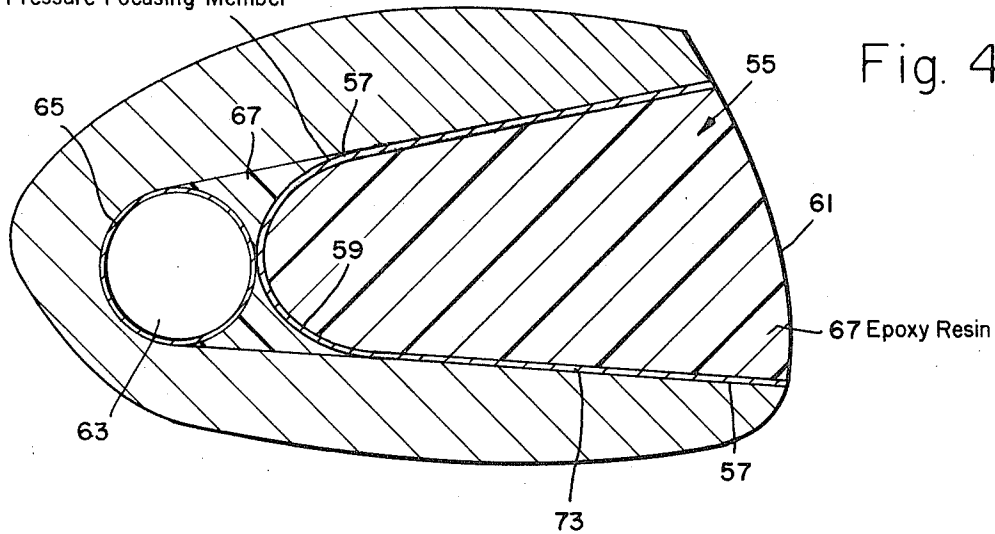


Fig. 4.



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FORCE FOCUSING GOLF CLUB

This is a continuation of application Ser. No. 135,403 filed Apr. 19, 1971 and now abandoned.

In the past there have been numerous schemes devised in order to enhance the distance driving and accuracy obtainable from a golf club. Many of these ideas revolve about a means incorporating moving parts and mechanical adjustments.

In this regard, it can well be understood that the head of a driving type golf club must be very rugged because of the tremendous forces to which it is subjected. This part of the club will experience tens of thousands of pounds per square inch of force when used even by a non-professional golfer. Accordingly, any club of this type that incorporates moving parts or adjustments must necessarily reduce the reliability of the instrument and have proved to be expensive to fabricate and produce. A golf club that utilized a simple, inexpensive and yet reliable technique which enhanced obtainable driving power would be a significant advancement to the golf club art.

Accordingly, it is an object of the present invention to overcome the disadvantages of the prior art and provide an improved golf club.

It is another object of the present invention to provide a simple to construct and reliable golf club that will enhance the driving distance obtainable.

It is still another object of the present invention to provide a golf club of the driver type that reflects and advantageously focuses shock waves caused by the golf ball impacting on the head's impact face.

These and other objects of the invention are obtained in a golf club having a head and an attached shaft wherein a recess extends inwardly from an impact face of the head. Pressure focusing means is disposed in the recess and has a concave surface facing the impact face for reflecting forces impinging thereon toward the impact face. Also, synthetic material is disposed in the recess about the pressure focusing means and fills the recess to the impact face.

The club may also include a skirt member extending from the concave surface toward the impact face and lining the recess wall and the concave surface may be a paraboloid.

Further, a gas-filled chamber may be disposed in the head adjacent to and on the side of the pressure focusing means opposite the impact face to further enhance the driving quality of the club.

The invention and specific embodiments thereof will be described hereinafter by way of example and with reference to the accompanying drawings wherein like reference numerals refer to like elements or parts and in which:

FIG. 1 is a perspective drawing of a golf club constructed according to one embodiment of the invention;

FIG. 2 is a cross sectional view of the golf club head of FIG. 1;

FIG. 3 is a cross sectional view of a golf club according to another embodiment of the invention wherein a gas-filled chamber is incorporated;

FIG. 4 is a cross sectional view of still another embodiment of the invention in which both an extended skirt and a gas chamber are provided; and

FIG. 5 is a partial cross sectional view of yet another embodiment of the invention wherein a passage is provided to adjust the gas pressure in the chamber.

With reference now to the drawings and more particularly to FIGS. 1 and 2, there is shown a golf club 11 having a head 13 and an attached shaft 15, the head comprising a tapered recess 17 having side walls 19 extending inwardly from an impact face 21 of the head 13. A pressure focusing means in the form of a focusing member 23 having a concave surface 25 is disposed in the recess 17 with the concave surface 25 facing the impact face 21. A synthetic material 27, such as an epoxy resin, is disposed in the recess 17 about the pressure focusing member 23 and fills the recess to the impact face 21.

The head 13 may be fabricated from any suitable material such as wood and wood laminates or a synthetic material, and the recess therein may be formed by any conventional method such as milling, using suitable conventional milling cutters or a specially fabricated one to provide the desired tapered shape.

The focusing member 23 may preferably be formed having a paraboloid shape and fabricated from a relative hard material such as sheet aluminum or steel or other metal. Also, the member 23 may include a skirt portion 31 extending toward the impact face 21 and lining the adjacent wall 19 as shown in FIG. 2, for example.

A golf ball, upon coming into a forceful contact with the impact face 21 of the head 13, causes pressure waves to propagate rearward through the head. Upon striking the reflecting member 23, however, much of this rearward moving force is reflected back toward the impact face 21 to generate a reverse thrust that will aid and add to the normal recovery memory of the synthetic material 27 and thus enhance the driving ability of the club.

By the use of the skirt member 31, the shock waves traveling rearward are concentrated more toward the focusing reflecting element 23 which will be thus even more effective in providing an aiding reverse thrust in the direction of proposed ball flight.

With reference to FIG. 3, a golf club 51 is shown having a head 53 in which a recess 55, with side wall 57, is provided. The recess 55 may be deeper than the one shown in FIGS. 1 and 2 and a focusing member 57, having a concave surface 59, is disposed therein spaced from the end of the recess. Adjacent to the member 57 but on the side thereof opposite an impact face 61 is disposed a gas-filled chamber 63 having a non-rigid spherical wall 65. The gas may be ordinary air or an inert gas or mixture of gases at a predetermined pressure. The space between the chamber 63 and focusing member 57 and between the member 57 and the impact face 61 may be filled with a synthetic material 67 as has been previously described with reference to the embodiments of FIGS. 1 and 2.

In operation, a pressure shock wave is caused to travel through the synthetic filler material 67 when a golf ball 69 strikes the impact face 61 of the golf club head 53. This shock wave is to a great extent reflected by the focusing characteristic of the focusing member 57 back toward the impact face 61. However, a portion of the force exerted on the member 57 causes it to move toward the chamber 63 and pushes against the spherical wall 65 to thereby compress the gas therein.

Compression of the gas in the chamber 63 in turn causes a reverse reaction forcing the non-rigid wall 65 to push against the member 57. This reaction thus produces force waves to travel toward the impact face 61 through the material 67. The ball 69, which does not 5 instantaneously leave the face 61 but rather deforms to an approximate shape seen by dashed outline 71 for a measurable period of time, not only receives the forces provided by the normal recovery memory of the synthetic filler material 67 as focused by the member 57, 10 but also receives such forces in a magnified manner due to the compression factor of the chamber 63. In other words, the shock wave caused by the impact of the golf ball 69 travels toward the focusing member 57 which tends to concentrate the reverse force back toward the ball 69. Since the maximum reflected force and force 15 caused by the compression of the gas within the chamber 63 occurs at the moment the ball begins its own recovery from its deformed configuration, the total reverse thrust effect will more than substantially lessen, if not eliminate, the loss of energy consumed in overcoming the inertia of the ball. This results in added velocity and distance of ball flight. This effect will be even further enhanced by providing a skirt member 73 as 20 shown in FIG. 4 and described previously in connection with the embodiment of FIG. 2.

The wall 65 of the chamber 63 may be fabricated from a relatively thin plastic material such as commonly used to fabricate table tennis balls. Also, it 30 should be noted that this chamber further acts as a counterbalance factor. By positioning this sealed spherical chamber at approximately the center of the club head, the weight of the head will be distributed on either side of the center line of the hitting area to provide for maximum efficiency and balance. 35

It may be advantageous under certain conditions to be able to adjust the amount of gas pressure present in the chamber 63. FIG. 5 illustrates a means whereby this may be accomplished. Here, a head similar to the one 40 shown in FIG. 3 is shown to have a passage way 81 extending through the rear portion of the head from the chamber 63. A gas valve assembly 83, similar to a pneumatic tire valve, may be inserted in the passage 81 to allow gas pressure adjustment or even the changing 45

of the gas or gases.

From the foregoing, it should be seen that the invention provides an improved and economical to fabricate golf club which has good balance, efficiency and ball driving characteristics.

In practicing the invention, any material having characteristics similar to that of the materials specifically described may be used. Also, variations in configuration may be made within the scope defined by the claims. For example, the recess 17 need not be tapered but may also have parallel walls.

It is intended that the foregoing disclosure and drawings shall be considered only as illustrations of the principles of this invention and are not to be construed in a limiting sense.

What is claimed is:

1. A golf club having a head, an impact face thereon, and an attached shaft, the combination comprising:

a pressure focusing metallic element disposed in said head, said focusing element having a concave inner surface defining a force focusing structure with an open end facing said impact face;

synthetic material in uniform contact with said inner surface and entirely and uniformly filling said inner surface forming and said impact face; and

a relatively thin-walled hollow ball disposed in said head adjacent to and on the side of said pressure focusing element opposite said impact face whereby pressure forces caused to propagate in said synthetic material inwardly from said impact face toward said inner surface and said hollow ball when a golf ball strikes said impact face are uniformly reflected by the action of said inner surface and said hollow ball and caused to propagate back through said synthetic material toward said impact face.

2. The golf club according to claim 1, wherein synthetic material is disposed between said hollow ball and said pressure focusing element.

3. The golf club according to claim 2, wherein a closable passageway is disposed in said head between said head between said hollow ball's inner chamber and an outer surface of said head.

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