

- [54] **GOLF CLUB WITH MEANS WITHIN THE SHAFT TO RIGIDITY THE SAME UPON IMPACT**
- [76] Inventor: **Salvatore L. Santorelli**, 160-14 Tenth Ave., Beechhurst, N.Y. 11357
- [22] Filed: **May 17, 1971**
- [21] Appl. No.: **144,220**
- [52] **U.S. Cl.** **273/80 B, 273/DIG. 29**
- [51] **Int. Cl.** **A63b 53/00**
- [58] **Field of Search** **273/77 R, 80 R, 80 A, 273/80 B, 80.2-80.8, DIG. 29; 260/37 SB**

- [56] **References Cited**
- UNITED STATES PATENTS**
- | | | | |
|-----------|--------|---------------------|-------------|
| 1,792,852 | 2/1931 | Mattern | 273/80.8 |
| 1,821,191 | 9/1931 | Robinson | 273/80.8 |
| 2,609,201 | 9/1952 | Martin | 273/DIG. 29 |
| 2,066,962 | 1/1937 | Cross | 273/80 A |
| 2,231,847 | 2/1941 | Dickson et al. | 273/80 A |
| 2,541,851 | 2/1951 | Wright | 260/37 SB |

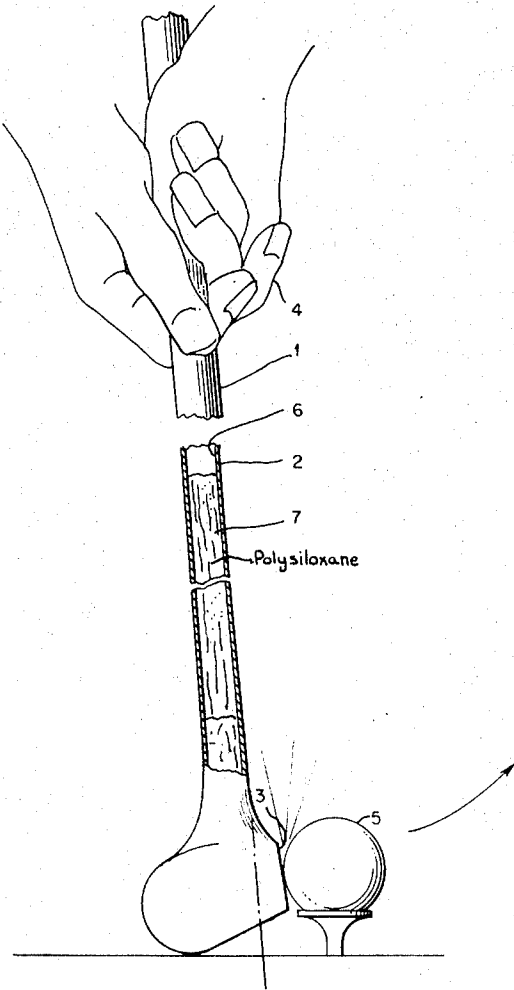
- | | | | |
|-----------|--------|-------------|----------|
| 1,904,750 | 4/1933 | Reach | 273/80 R |
| 2,078,728 | 4/1937 | Lard | 273/80 B |
| 3,083,969 | 4/1963 | Bills | 273/80 R |
| 3,265,401 | 8/1966 | Spier | 273/80 R |

Primary Examiner—Richard C. Pinkham
Assistant Examiner—Richard J. Apley

[57] **ABSTRACT**

A golf club comprising a hollow shaft with a grip at one end and a club head attached to the other end. The shaft is made of a material to impart a predetermined flexibility to the shaft. The shaft is partially filled from the attachment end up to a predetermined distance within the shaft with a normally flexible plastic material, preferably a polysiloxane composition, that does not alter the predetermined shaft flexibility under static conditions but has the characteristic of increased rigidity upon impact thereby imparting rigidity to the flexible shaft at the time of impact of the club head with a golf ball.

4 Claims, 2 Drawing Figures



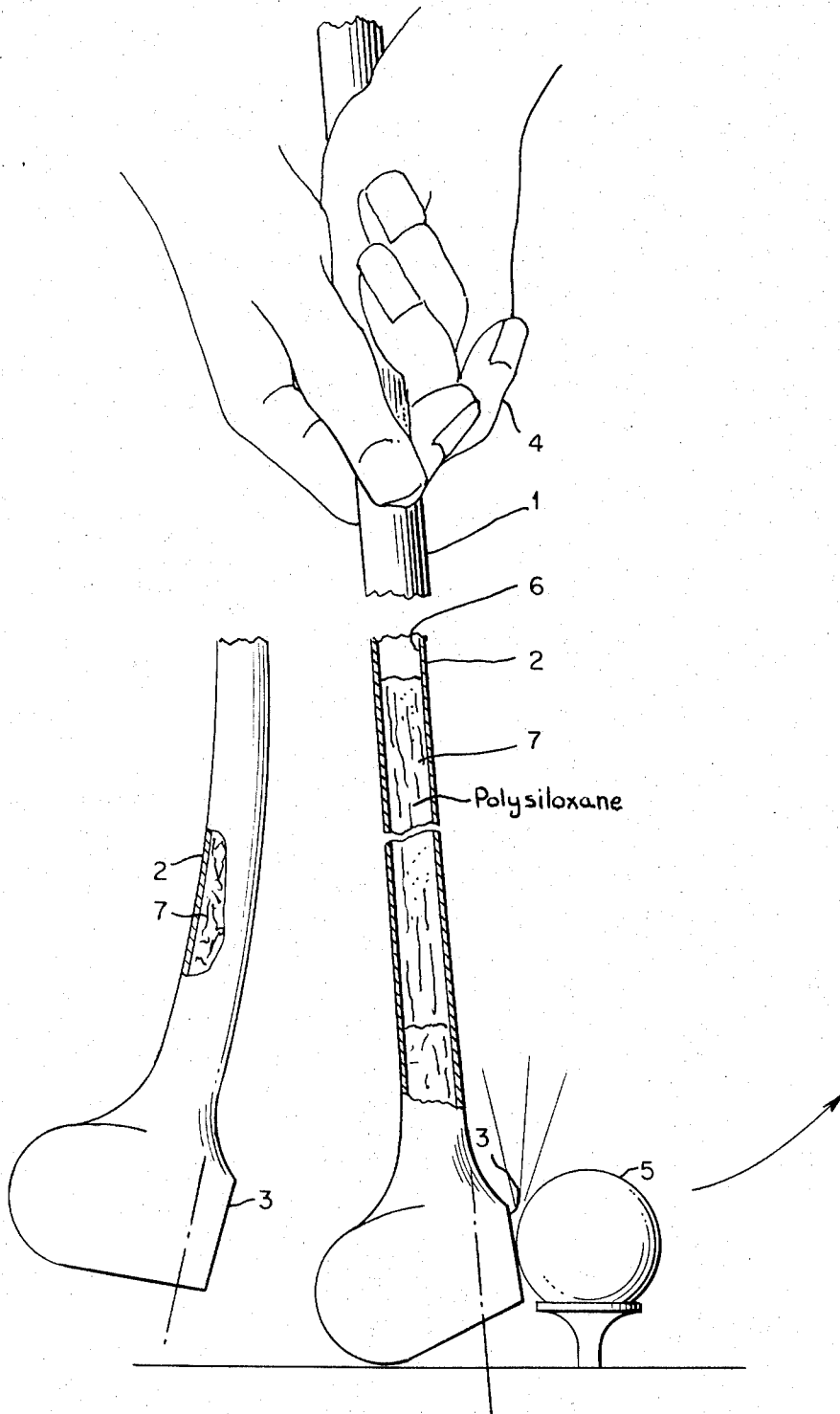


Fig. 1b

Fig. 1a

GOLF CLUB WITH MEANS WITHIN THE SHAFT TO RIGIDITY THE SAME UPON IMPACT

The present invention relates to an improved golf shaft which is provided with a cavity therein. More particularly the cavity is partially filled with a material which is capable of rendering such shaft rigid and having a dampening effect on the golf shaft upon impact with the golf ball.

By way of background it is well known to manufacture golf shafts out of wood plastic, aluminum and certain light weight steel. The golf manufacturers have for years sought ways and means to manufacture golf shafts which have varying degrees of flexibility, weight and strength in order to better impart to a golf ball, on impact, greater distance and accuracy. Accuracy and distance are the principal criteria for which a golf club designs have been considered.

It is not unusual to see a golf shaft flex when arced back and swung with force. Flexure of the golf shaft depends upon the force of the swing and on the type of shaft used, namely a soft, medium or stiff flex shaft. A golfer with a very strong and powerful swing will use a stiff flex shaft to avoid having too much flexure in the shaft when the club head makes contact with the ball, otherwise the ball will not have an accurate flight. In other words the golfer strives to have the shaft straight when the ball is struck. Furthermore, the ball should also be hit directly for accuracy and distance. If the ball is hit at the toe or heel of the club head, a certain amount of torque is imparted to such golf club causing inaccuracy to the trajectory of the ball.

Accordingly, it is the main object of the present invention to avoid the defects of the prior art.

A further objective is to provide the golf shaft with sufficient structure to allow a strong hitter to use a more flexible shaft and still maintain accuracy and distance.

Still another object of the present invention is to greatly minimize the torque imparted to the golf club when the ball is hit on the toe or heel of the club head.

Other objects and advantages of the present invention will become more apparent with respect to the specification, claims and drawings.

The golf shaft 2 can be made of metal or plastic providing the shaft has a suitable cavity 6 throughout its length which will accept a suitable material 7. The material 7 used to partially fill the cavity 6 may be a polysiloxane composition. The materials 7 preferably used as mentioned above, are the putty-like elastic plastic polysiloxane compositions prepared according to U.S. Pat. Nos. 2,541,851 and 3,350,344. These putty-like elastic plastics have the property which on impact causes them to harden and become rigid, and thereafter returning to their putty-like state.

In the Drawings:

FIG. 1a is a perspective view with partial cross-section of a golf shaft showing the present invention.

FIG. 1b illustrates the golf shaft of FIG. 1a during backswing before impact with the ball.

FIG. 1a shows the inventive golf club 1 including a shaft 2 having a club head 3 affixed at one end. The shaft is usually gripped at the upper portion with both hands 4 and swung in an arcing manner to impart a force to a golf ball 5 in order to drive it toward a given hole. FIG. 1b illustrates the flexure of the shaft 2 upon the backward stroke just prior to impact of the driving

portion 3 with the ball 5. According to the invention the shaft 2 is provided with a cavity 6 running along its length. For a given length of the cavity 6, for example, about a length of 8 inches up from the point of attachment of the driving portion 3 to the shaft 2 there is provided a filling material 7 in such shaft 2 exhibiting certain properties to be described hereinafter. It has been found that in some instances up to, for example, about one-half of the shaft length 2 can be filled with such material and yet not depart from the spirit and scope of the invention. An essential characteristic of the filling material 7 be that it not in any manner add or detract from the flexibility of the shaft 2. The material 7 is a putty-like elastic plastic, such as, a polysiloxane composition. The material 7 added into the cavity 6 must have the property of causing the shaft 3 to become rigid immediately at the moment of impact between the driving portion 3 with the ball 5. In other words, the hollow shaft per se is made of a material to impart to it a predetermined flexibility, commonly classified as soft, medium, or stiff. The shaft is then partially filled from the attachment end up to a predetermined distance with a normally flexible plastic material, preferably a polysiloxane composition, that does not alter the predetermined shaft flexibility under static conditions but has the characteristic of increased rigidity upon impact thereby imparting rigidity to the flexible shaft, no matter what its original stiffness classification may be, at the time of impact of the head with a golf ball.

By way of example two golf clubs obtained from the same manufacturer were employed to test the difference obtained when one club was treated according to the present invention and the other remained untreated. A polysiloxane composition as described above was inserted into the shaft 2 of one of the clubs, tamped down so that it filled the cavity 6 to a height of about 8 inches, measured from the point of attachment of the shaft 2 to the club head 3. Both shafts 2 measured out to the same flexibility under non-impact conditions.

The above two golf clubs were tested by professionals and it was found that it was not possible to control the ball when using the untreated club. However, on using the treated club it was discovered that no problem resulted in controlling the ball even with a medium flex shaft. It was also ascertained that a treated, less expensive club had the same accuracy and distance obtained with a costlier club. The treated club has a firmness and solidarity on impact with the ball, according to the professional golfers who conducted the test.

Several other golf shafts were treated filling the shaft cavity up to one half the height of the shaft measured from the point of attachment of the shaft to the club head. The same beneficial effects were noted.

While the invention will find special utility in connection with specially manufactured golf shafts, it is not to be considered so limited, but the inventive idea is shown by way of example as to the scope of the invention.

What I claim is:

1. A golf club comprising a hollow shaft with a grip at one end and a club head attached to the other end, said shaft being made of a material to impart a predetermined flexibility to said shaft, said shaft being partially filled from the attachment end up to a predetermined distance within the shaft with a normally flexible

3

plastic material that does not alter said predetermined shaft flexibility under static conditions but has the characteristic of increased rigidity upon impact thereby imparting rigidity to said flexible shaft at the time of impact of said club head with a golf ball.

2. A golf club according to claim 1 wherein said predetermined distance is from about eight inches to about one half the length of said shaft.

4

3. A golf club according to claim 1 wherein said plastic material is a polysiloxane composition.

4. A golf club according to claim 1 wherein said plastic material is a polysiloxane composition and said predetermined distance is from about eight inches to about one half the length of said shaft.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65