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C. A. KURZ, JR

GOLF CLUB

Filed July 2, 1919

Fig. 1

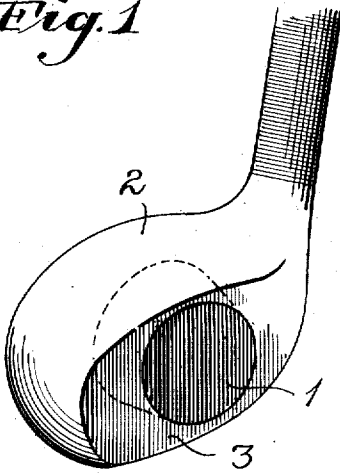


Fig. 2

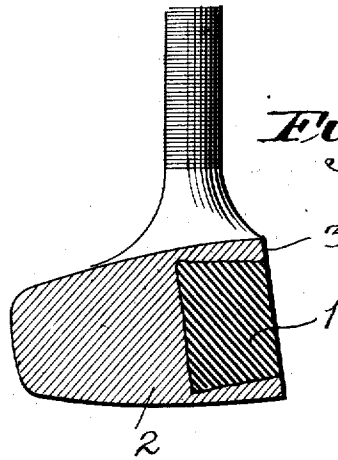


Fig. 4

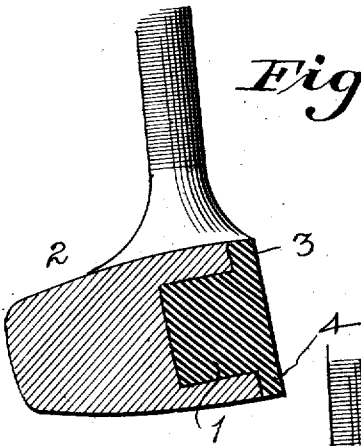


Fig. 3.

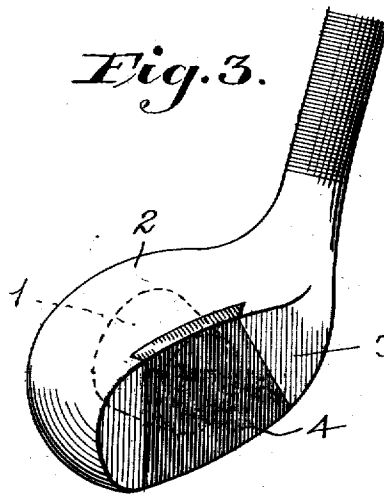


Fig. 5



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UNITED STATES PATENT OFFICE.

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GOLF CLUB.

Application filed July 2, 1919. Serial No. 308,095.

To all whom it may concern:

Be it known that I, CHRISTIAN A. KURZ, Jr., citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Golf Clubs, of which the following is a specification.

My invention relates to golf clubs and more particularly to the mode of reinforcing the striking face of the club by the addition of an insert of a body of phenolic condensation product.

The object of the invention is to increase the efficiency of the club by improving its driving power and the accuracy of the stroke by embodying in the head of the club a body of material which will impart to the ball the full force and effect of the blow without absorbing any material part of the force or shock, thereby giving to the club more "life."

A further object of the invention is to increase the wearing qualities and durability of the club by providing a striking face which will be unlikely to be injured by the repeated blows and which will withstand the usual hard usage to which golf clubs are subjected.

A further object of the invention is to provide an insert which will unite with the wood of the head to form a perfect union therewith and which will not be affected by changes of temperature nor subject to expansion or contraction under variations of either temperature or moisture and which will maintain its seat in the club head without the usual tendency of such inserts to become loose.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation or their equivalents as will hereinafter be described and set forth in the claims.

Referring to the drawings, Fig. 1 is a perspective view of the head of a golf club embodying the present invention. Fig. 2 is a transverse sectional view thereof. Fig. 3 is a perspective view of a golf club head in which the present invention is embodied in a modified form. Fig. 4 is a transverse sectional view of the head shown in Fig. 3.

Fig. 5 is a detail sectional view of a further modification.

Like parts are indicated by similar characters of reference throughout the several views.

It has been customary in the past to reinforce the striking face of gold clubs, usually by means of an inlay of fiber lignum-vitæ wood or other close grained material which is not easily broken. These inlays were frequently secured by means of dowel pins passing through the inlay and into the body of the head however, such inlays were not always successfully and accurately set to the head, or became loosened in play, or by expansion and contraction of the material. Furthermore the materials heretofore used have not possessed the requisite degree of resistance to the shock or impact of the stroke and have not afforded the desired driving power nor the degree of solidity necessary to accuracy on long drives. These difficulties have been overcome and the desirable qualities attained by the present construction wherein a body 1 of phenolic condensation product commonly known in the trade under the trade name of bakelite, condensite, redmanol or like material, is embedded in the striking face of the golf head 2 by being moulded in situ therein. The body of phenolic condensation product 1 may be of any desired shape or size, according to the purpose of the club and the peculiarities or desires of the player. In Figs. 1 and 2 the body of phenolic condensation product has been shown of truncated conical form embedded in the head 2 with the smaller extremity exposed flush with the striking face 3 of the club. In fitting the club with such insert body the face of the club is provided with an under-cut hole, or one having a reduced orifice and widened or expanded within the body of the club head to afford anchorage for the insert. The phenolic condensation product may be mixed with a filler of any desired character, either fibrous in character or of powdered form, or may be employed without such filler if so desired. It is common practice in the use of phenolic condensation product to employ a filler of wood, asbestos, marble dust and various other materials whereby the ultimate character of the product is varied. There is now in use a phenolic condensation composition for the manufacture

of billiard balls which will be found quite suitable for the present purposes although other compositions of phenolic condensation materials may be employed.

5 In embodying the insert, the cavity in the head 2 is filled with the raw material, the head being placed in a suitable mould or re-
tainer, and the raw material to form the insert is subjected to heat and pressure as is
10 usual in the moulding of these materials. The material, being fluxed by the application of heat and subjected to pressure while in a fluxed condition, is caused to penetrate into the fibers and pores of the head 2, and
15 so in effect knits the insert 1 and the head 2 into a single integral body. The insert 1 moulded in situ within the cavity formed in the head 2 under pressure thus is made to conform accurately to the shape of the
20 recess. The phenolic material possessing a negligible factor of expansion and contraction will not be loosened readily from its seat within the head and is anchored not only by the shape of the cavity or recess,
25 but also by the penetration of the phenolic material into the pores and fiber of the wood.

It has long been the custom to provide golf club heads with weights by pouring
30 molten metal, such as lead or Babbitt metal into a recess in the head. However in such cases there is not the union of the insert with the head as in the present case, and furthermore the insert cannot fit with the same accuracy
35 as in the present instance, since the hot metal not only causes the wood to shrink, but upon cooling the metal body itself shrinks away from the wood. In the present instance, the moulding in situ of the
40 phenolic condensation product under pressure causes the fluxed product to follow the wood in its shrinkage caused by the application of heat. The material of the insert being compressed within the recess will not
45 shrink away from the wood nor change its size upon cooling, as is the case with metal. Another material difference between the result of the present process and that of
50 moulding in situ of metal weights, is that the insert firmly unites or knits with the surrounding surface.

11. Fig. 3 there has been shown a modification of the simple insert shown in Fig. 1, in which the body of the insert of either
55 cylindrical or conical form is provided with a trapezoidal head 4. The head 4 is located in a recess or mortise in the face 3 of the golf club head and is formed in situ by
60 moulding this head within the recess or mortise integral with the main body of the insert extending rearwardly into the body of the head. This form of insert affords a
65 more extended striking surface than that shown in Fig. 1. The mortise or recess to receive the trapezoidal head may be of

dove-tailed or under-cut form or may be provided with straight sides as is found most convenient or desirable. The phenolic condensation product forming the head of the insert will unite with the surrounding
70 wood surface by entering the pores and into the grain of the wood as before described, and any dove-tailed or under-cut shape of the mortise merely adds to the security of the head of the insert. Likewise, in lieu
75 of making the rearward extending portion of the insert tapered or of conical form as is shown in Fig. 2, this portion of the insert may be cylindrical as further shown
80 in Fig. 4.

In lieu of a single embedded body as shown in Fig. 4, the face plate or head of the insert may be provided with a plurality of rearward or inward projecting
85 studs or spuds, as shown at 5 in Fig. 5. In the construction shown in Fig. 5, the head 2 of the golf club is prepared for the insert by forming in the face thereof the mortise or recess in accordance with the
90 shape and extent of the striking face desired, and then providing in the bottom of said recess or mortise, a series of holes which may enter the golf club head in parallel
95 relation one with the other, or in inclined or diagonal relation, whereby they will afford additional anchorage for such inserts. Any number of these holes may be
100 provided and the series of holes and the mortise or recess in the face of the club head with which these holes communicate are subsequently utilized as the mould for the insert. While the head 4 of the insert
105 has been shown of trapezoidal form, it is obvious that it may be of any desired shape or proportion. Moreover, instead of a single insert of phenolic condensation material, the striking face may be provided with a series of inserts arranged in various designs.

By the term phenolic condensation product as herein used and as hereinafter set forth in the claims is meant those synthetic
110 compounds or materials resulting from the reaction of not only phenols, but also their homologues, derivatives or equivalents, and formaldehyde or its polymers, derivatives
115 or equivalents, and other methylene containing substances to which may, or may not have been added suitable filling material.

From the above description it will be apparent that there is thus provided a device of the character described, possessing the particular features of advantage before
120 enumerated as desirable but which obviously is susceptible of modification in its form, proportion, detail construction or arrangement of parts, without departing from the principle involved or sacrificing any of its
125 advantages.

While in order to comply with the statutes, the invention has been described in language more or less specific as to certain structural features, it is to be understood that the invention is not limited to any specific details, but that the means and construction herein described comprise but one mode of putting the invention into effect, and the invention is therefore broadly claimed in any of its possible forms or modifications within the scope of the appended claims.

Having thus described my invention I claim:

1. A wooden golf club head and an insert of phenolic condensation material molded in situ in the striking face of the club head.

2. In a construction of the character described, a wooden golf club head having a recess therein and an insert molded in situ in said recess under pressure while in a substantially plastic condition by which the insert is caused to be knitted fast to the wooden body by being forced into the pores thereof.

3. The combination with a golf club head of wood, having therein a recess, of an insert of plastic material molded in situ in said recess and united with the material of the golf club by being caused to penetrate the pores thereof.

4. The combination with a golf club having a porous head of a body of phenolic condensation material inserted therein, said insert being anchored by having portions

thereof projected into the pores of the body of said club.

5. The combination with a golf club having an inwardly widened recess therein of a body of phenolic condensation material molded in situ in said recess.

6. A golf club head and an insert of temporarily plastic material possessing a minimum factor of expansion and contraction molded and hardened in situ in the striking face of the golf club head.

7. A golf club head, characterized by an insert of phenolic condensation material embedded in the striking face thereof.

8. A golf club characterized by an insert embedded in the striking face thereof consisting of phenolic condensation material intermixed with a filler material by which the resiliency of the phenolic condensation material is modified.

9. The herein described process of providing inserts in wooden golf club heads and the like, consisting in forming a recess in a porous body, filling the recess with a temporarily plastic material, subjecting the body of material to pressure to cause it to penetrate the pores of the porous body, and permitting the material to solidify in its compressed form.

In testimony whereof, I have hereunto set my hand this 9th day of June A. D. 1919.

CHRISTIAN A. KURZ, JR.

Witnesses:

HARRY F. NOLAN,
F. L. WALKER.