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2,495,119

METHOD OF FORMING GOLF CLUB GRIPS

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2 Sheets-Sheet 1

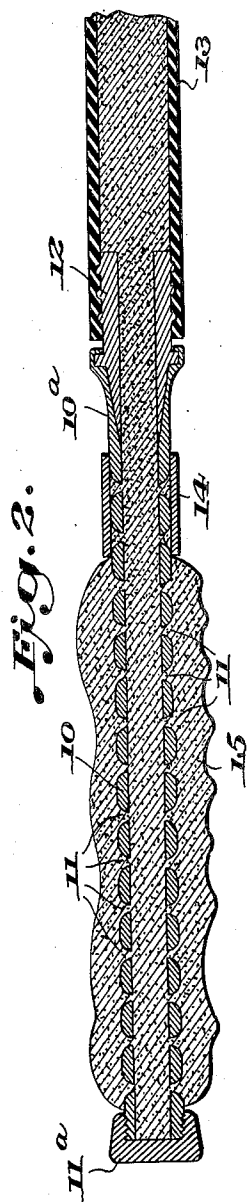
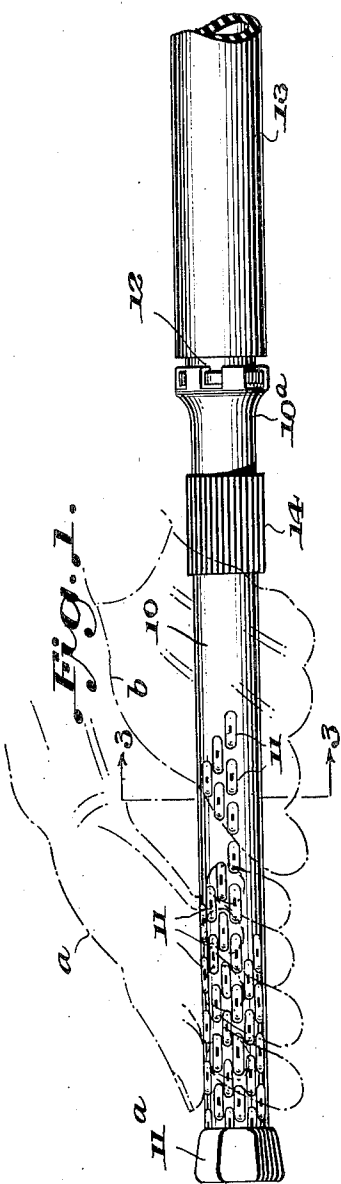


Fig. 1.

Fig. 2.

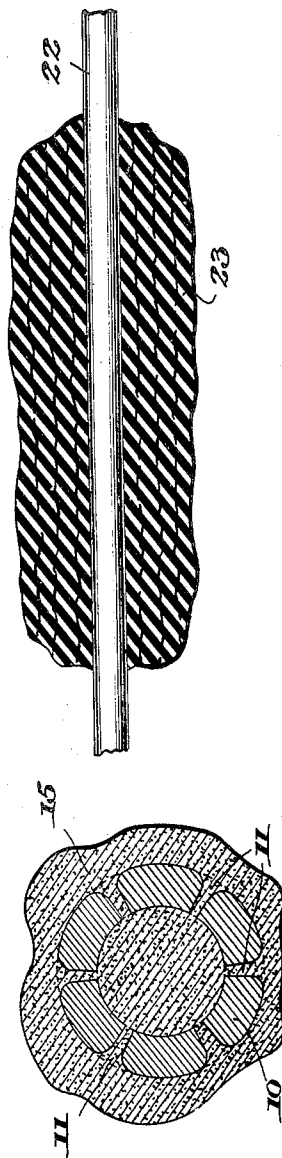


Fig. 3.

Fig. 4.

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*Fig. 5.*

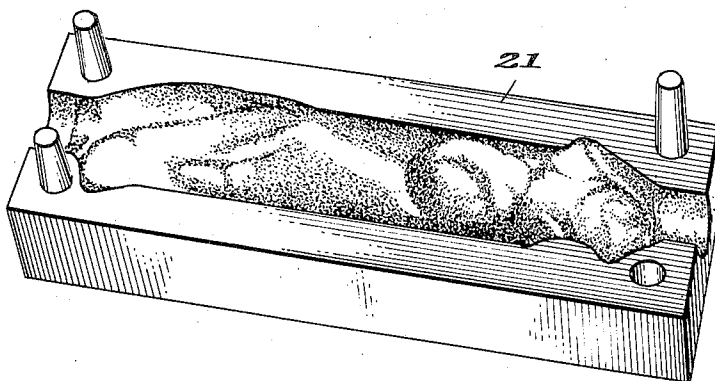
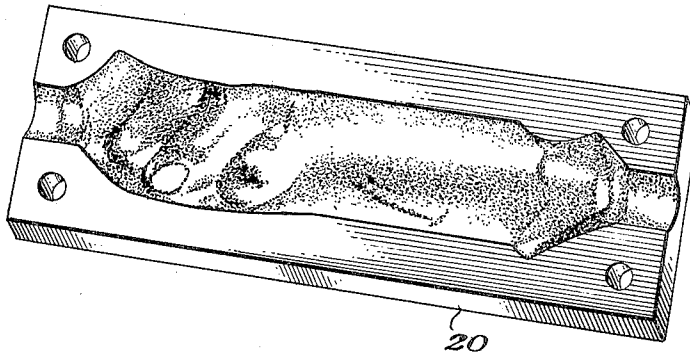
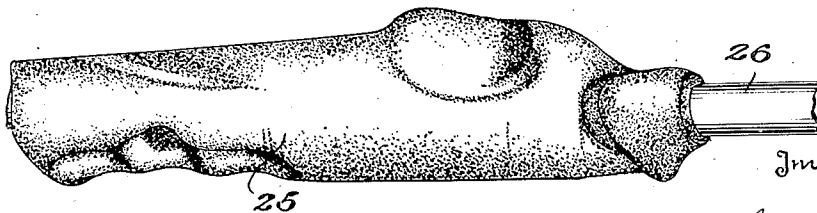


*Fig. 6.*



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## UNITED STATES PATENT OFFICE

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## METHOD OF FORMING GOLF CLUB GRIPS

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5 Claims. (Cl. 18—55.1)

1 The present invention relates to methods for making golf club grips.

It has long been appreciated by golfers that, in order to secure optimum results in playing any stroke, the shaft of the golf club used must be so held by the player that it may not rotate or turn in the player's hand. In order to minimize the possibility of such turning or rotation of the shaft, which is generally of wood or metal and of relatively small diameter, it is customary to encase that end of the shaft which is customarily gripped by the player with some material such as rubber, leather, cork or the like, this covering being generally designated a golf club "grip." These grips are universally applied to the club handles of the clubs of all players and, while it has previously been suggested that certain advantages might be realized if each player be provided with golf club grips which have been especially shaped to receive his hands rather than the hands of any other, no method of or apparatus for forming a golf grip especially for one individual player has heretofore been found to be feasible.

In accordance with the present invention an entirely practical method for individually forming golf club grips is provided making it possible for the first time for a player to obtain for himself, if he so desires, a grip especially shaped to receive his hands, for each of his clubs, the method of forming such a set of grips being of such simple nature that it may be carried out quickly, without requiring the player himself to devote any appreciable time to the operation, and at relatively low cost. This improved method will be described in detail and one form of apparatus which has been primarily designed to facilitate the practice of the method is illustrated in the accompanying drawings, in which

Figure 1 shows in side elevation portion of the apparatus employed in the formation of a molded core having the impression of the player's hands on its surface;

Figure 2 is a longitudinal or axial section through the portion of the apparatus shown in Figure 1;

Figure 3 is a transverse section on line 3—3 of Figure 1;

Figure 4 shows in side elevation a core rod upon which a body of rubber has been placed, as by wrapping sheet rubber around the rod, a blank being thus formed for subsequent molding operations;

Figure 5 shows in perspective the two halves of

2 a mold in which the blank of Figure 4 is finally shaped under heat and pressure; and

Figure 6 shows in side elevation one of the completed golf club grips in position on the shaft of a golf club.

5 An essential feature of the apparatus for forming the improved golf club grip is shown in Figures 1, 2 and 3 and comprises the member 10, which may be designated a forming tube or forming member. This member is preferably tubular as shown, the outer diameter being such that the hands of a player, such, for instance, as those indicated at *a* and *b*, in chain lines, in Figure 1, may grip it in exactly the same way that they 10 may grip and hold a golf club shaft which has been encircled or enveloped by a grip. In other words, the diameter of the tubular member 10 is greater than that of the usual metal golf club shaft and approximately the same as the diameter of a conventional golf club grip, that is, the forming member 10 is of such diameter and length that it may be grasped by a player in substantially the same manner that that player will grasp the grip of a golf club which he has already 20 found to be of proper dimensions. If desired several forming members 10, varying slightly in diameter, may be provided in order that the hands of all golfers seeking individualized grips may be accommodated. However, except for 30 players' hands which are extraordinarily large or extraordinarily small, a single forming member 10 will suffice.

It will be observed that member 10 is tubular and provided with a plurality of openings 11 35 which flare outwardly, thus permitting plastic material forced into the tube from one end to pass outwardly at a plurality of points. It is not necessary that these openings have the shape illustrated, as they may vary widely in cross section, but preferably they are grouped so that plastic material forced outwardly will for the most part enter the space, which may be designated a mold chamber, between the surface of the member 10 and the hands of the holder. 40 One end of the member 10 is provided with a cap 11a which may be removed from time to time to facilitate cleaning of the bore and the other end has attached thereto or integral therewith one element 10a of a separable connector, the mating 45 element being indicated at 12 and functioning to detachably connect the flexible tube 13 to the member 10. Any suitable form of detachable connector may be employed.

Mounted upon the forming member 10 is a short tube or sleeve 14, this sleeve being slidable

axially on member 10 and being designed and intended to function as a valve which may close a greater or smaller number, as desired, of the openings formed in the member 10 or, in other words, may be used to lengthen or shorten that portion of the member 10 which is to be actually used in the operation of forming the grip, so that when the player's hands cover only a portion of the perforated section of member 10 the perforations in the remainder may be closed and thus avoid waste of plastic material by insuring that plastic material is forced out only under the hands of the player.

After the hands of a player have been placed around the forming member 10 in the precise relative positions which they occupy when the player is grasping a club, a plastic material may be forced through the tube 13 into the interior of member 10 and this plastic material will issue from the perforations 11 into the mold space defined by the inner surface of the player's palms and fingers and the outer surface of the forming member. The plastic material may conveniently be sculptors wax and the pressure will be continued until the space between the player's hands and the tube 10 is completely filled. Some of the extruded material will, of course, pass between and around the hands, and at some points the extruded layer of plastic will be relatively thin and at other areas will be relatively thick, depending upon the amount of space between the forming member and different parts of the player's hands. A core which has been formed in this way is indicated at 15 in Figures 2 and 3 but it will be appreciated that these cores will vary widely in appearance, depending upon the nature of the hand grip which has been adopted by the player. After the core 15 has been formed by the extrusion process described the player will remove his hands and the operator can trim and brush the core until it is smooth, as indicated in Figures 2 and 3. The core 15 will have impressed in its surface the precise impression of the player's hands and it only remains to construct a mold having such configuration and by means of which the desired number of grips can be molded.

In order to construct the mold metal is deposited upon the surface of the core 15 by electrolytic or other methods so that the core then comprises a plastic body supported on forming member 10, the exterior surface of which body is metal coated. The forming member 10 is then withdrawn from the core, the cap 11a being first preferably removed so that the member may be freely withdrawn axially. Following this the wax upon which the metal has been disposed is melted away, and by a known casting process a block of light metal, for instance aluminum, is cast around the coated core, this operation resulting in the formation of a solid block of metal with a cavity having the exact surface configuration of that of the outer surface of the former hollow core. This block may be divided into two similar portions by sawing it longitudinally and the two portions, which are indicated at 20 and 21 in Figure 5, comprise two portions of a mold to be used in the formation of one or any number of golf club grips.

In forming such a grip rubber may be utilized and in one satisfactory process a core rod of metal, such as that indicated at 22 in Figure 4, and the diameter of which is slightly smaller than the diameter of the golf club shaft to which the grip is to be applied, is wound with sheet

rubber until a blank or mass such as indicated at 23 is mounted thereon. The rod with the rubber mass mounted thereon is then placed in the mold previously described and, by the application of heat and pressure, the rubber is reduced to the precise form of the mold and vulcanized. When this operation is completed the halves of the mold are separated, the completed grip removed and the core rod 22 withdrawn. The completed grip, which is indicated at 25 in Figure 6, is then placed upon the shaft of the golf club which is indicated at 26. Due to the fact that the golf club grip 25 has been formed upon a core rod 22 which is of less diameter than the shaft 26 of the club, it is necessary to stretch the grip somewhat in applying it to the golf club shaft. Hence the grip tends to retain its position when once so applied. In order that it may be definitely prevented from turning upon the shaft 26 at any time either the shaft or the interior of the grip is coated with glue before the application of the grip to the shaft. When the glue hardens it is impossible to turn the grip at any time. Naturally, before the glue is allowed to harden, the grip is turned to its correct position on the shaft, there being only one correct position for a grip which has been fabricated in the manner stated.

It has heretofore been proposed that golf grips fashioned to fit the hands of individual players may be fashioned with the aid of cores of plastic material bearing the imprint of the player's hands but in the practice of such methods plastic material has generally been placed upon a rod, such for instance as the core rod 22, and the player has been instructed to squeeze or press his hands into the plastic mass in order to shape it. Unless the plastic is extremely soft the player is not able to displace it sufficiently by contracting or gripping the core so that the impression which he makes truly represents the positions of his hands as he would like to have them. If the plastic employed is sufficiently soft to permit this to be done, it deforms and changes shape as soon as the player removes his hands. By the present method, however, the player is enabled to first position his hands upon the forming member exactly and precisely as he would prefer to have them each time he grasps a golf club shaft and, by merely holding his hands in the positions in which they have been carefully placed, and extruding the plastic material in the manner described, perfect hand impressions may be obtained upon the resulting core, and with the use of plastic material which is not of such soft nature that it will change shape as soon as the player's hands are removed.

Once a mold has been formed any number of grips may be fabricated at relatively small cost as the molds will last indefinitely. Various materials may be employed but the rubber grip, or grips of rubber composition, are eminently satisfactory in use and may be made with facility.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. The method of forming a golf grip which comprises, causing the player to grasp a perforated tubular member, causing material which is plastic at ordinary temperatures to flow outwardly through the perforations in said member and engage the player's hands so as to form a core the surface of which has the contour of the inner surfaces of the player's palm and fingers when grasping a golf club, plating the surface of

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said core with metal to form a metallic shell thereon, removing the core from said shell, casting metal around said shell, severing the casting to form a two part mold, and utilizing the mold to form a grip to be applied to a golf club handle.

2. The method of forming a golf grip which comprises, causing the player to grasp a perforated tubular member, causing material which is plastic at ordinary temperatures to flow outwardly through the perforations in said member and engage the player's hands so as to form a core the surface of which has the contour of the inner surfaces of the player's palm and fingers when grasping a golf club, plating the surface of said core with metal to form a metallic shell thereon, withdrawing said member from said shell and removing the plastic core by the application of heat to said shell to cause it to flow, casting metal around said shell, severing the casting and shell to form a two part mold, and casting a golf grip in said mold.

3. The method of forming a golf club grip which comprises causing the player for whom the grip is to be made to grasp a tubular forming member the wall of which is perforated, and forcing a plastic material outwardly through the perforations of said tube while the player maintains his grasp.

4. The method of forming a golf club grip which comprises causing the player for whom the

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grip is to be made to grasp that portion of a tubular forming member which is provided with openings for the passage of plastic materials, and forcing a plastic material which is flowable at ordinary temperatures outwardly through said openings while the player maintains his grip.

5. The method of forming a golf club grip which comprises causing the player for whom the grip is made to grasp a core or forming member, flowing plastic material which is flowable at ordinary temperatures into all spaces intermediate the hands of the player and said forming member, and thereafter causing said player to release his grip without changing the outer contour of the body of plastic material outside of the forming member.

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