Jan. 3, 1967 J. K. GARRITY 3,295,850

GOLF CLUB INCLUDING HANDLE MEANS WITH TAPERED UPPER END OF REDUCED DIAMETER

Filed Sept. 14, 1964 2 Sheets-Sheet 1

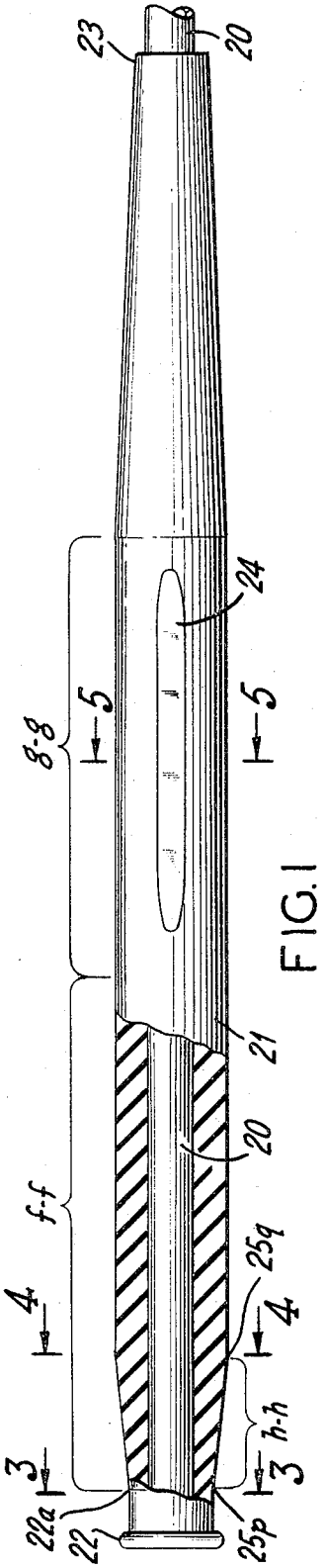


FIG. 1

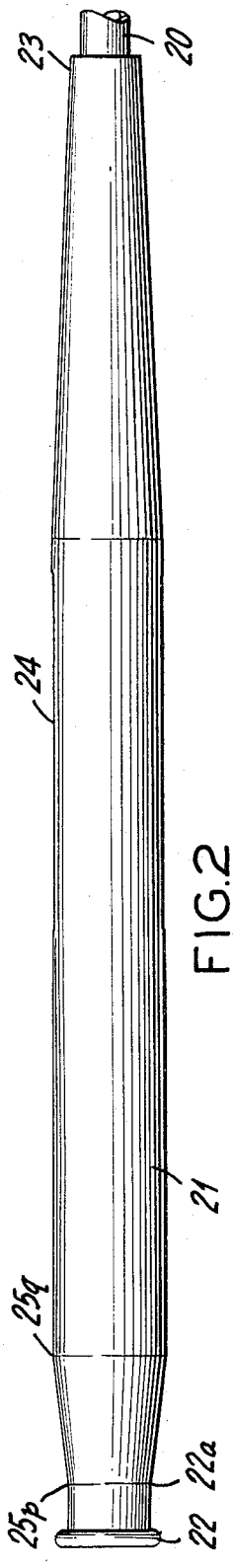


FIG. 2

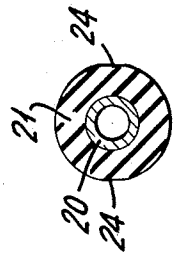


FIG. 5

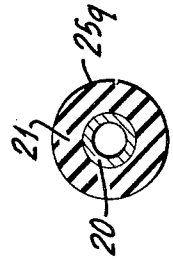


FIG. 4

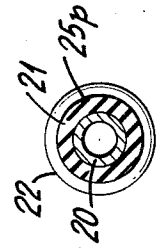


FIG. 3

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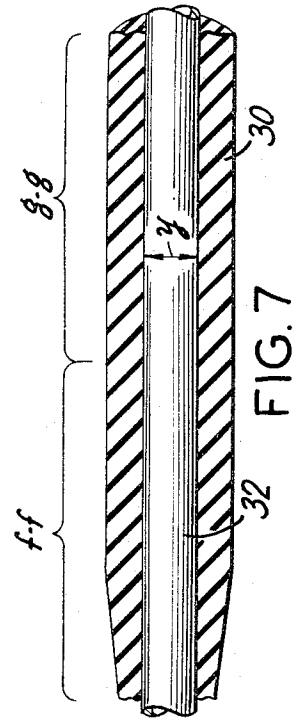


FIG. 7

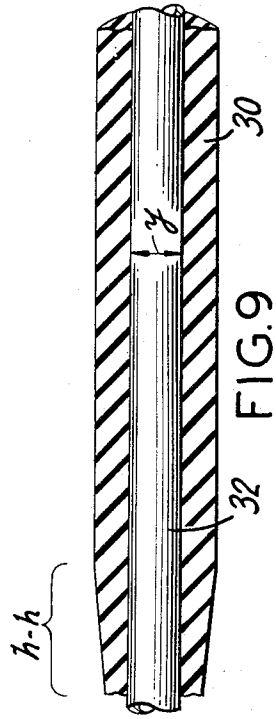


FIG. 9

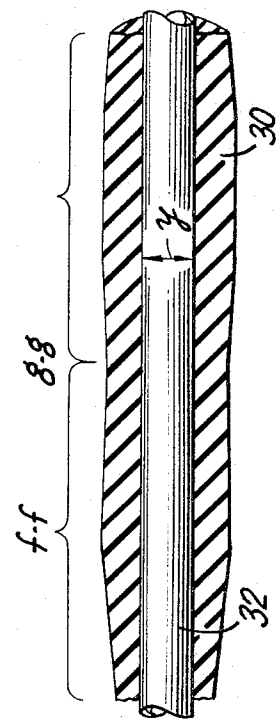


FIG. 11

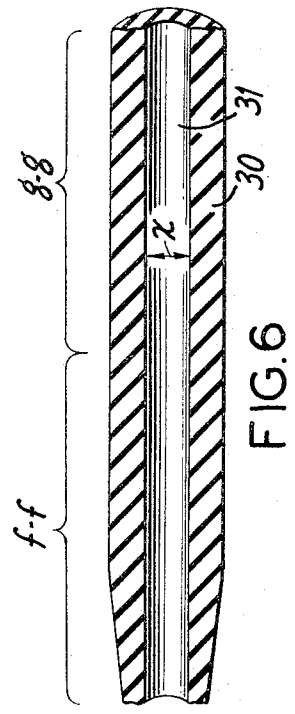


FIG. 6

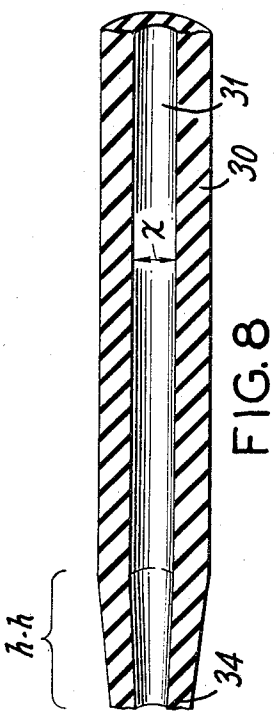


FIG. 8

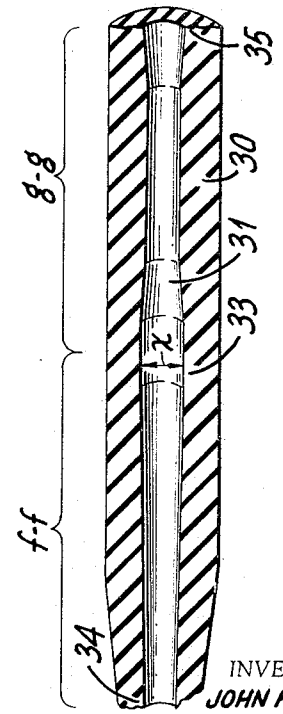


FIG. 10

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3,295,850

GOLF CLUB INCLUDING HANDLE MEANS WITH TAPERED UPPER END OF REDUCED DIAMETER

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Filed Sept. 14, 1964, Ser. No. 396,129
3 Claims. (Cl. 273—81.4)

This application is, in part, a continuation of my copending application for Golf Club Grip, filed June 11, 1963, under Serial No. 286,970 and now abandoned.

This invention relates to a novel molded grip for a golf club.

Golfers experience much difficulty in maintaining throughout their swing a firm hold on the club with the hand that grasps the club farthest from the club head. Another difficulty is that their accuracy and distance is impaired because they do not utilize the hand that grasps the club closest to the club head to transmit a greater impact force to the ball.

The conventional golf club grip has its greatest perimeter at the extreme end of the shaft oppposite from the club head. The perimeter diminishes in a gradual taper along the shaft in the direction of the club head. When the club is held in the orthodox manner, for example, by a player commonly understood to be right-handed, the relative positions of the hands is such that the left hand is more proximate to the extreme end of the shaft opposite the club head and the right hand is more proximate to the club head. In these relative positions, the greatest perimeter of the gripping area is contained by the left hand. The conventional grip construction contributes to the difficulty experienced by golfers in maintaining a firm hold on the club with the left hand throughout the swing. This is because the smallest portions of the left hand are required to maintain a firm hold on the largest portion of the grip. In addition, the conventional grip contributes to the difficulty encountered by experienced golfers in the use of the right hand to impart a major portion of the impact force to the ball. This difficulty with the conventional grip arises because the right hand grasps the smaller portion of the grip and is unable to maintain the firm hold on the grip that is necessary for proper transmission of force from the right hand to the club.

It is an objective of the present invention to provide a golf club grip which overcomes much of the difficulty experienced by golfers in maintaining throughout the swing a firm hold on the club with the hand that grasps the club farthest from the club head. It is a further objective of the present invention to provide a golf club grip which will enable the player to impart to the club a maximum of force with the hand that grips the club closest to the club head.

It is a further object to provide molded golf club grips having outer dimensions that differ from each other with respect to selected portions of the grips.

I have found that these objectives can be accomplished by use of a golf club grip in which the smallest perimeter of the gripping area is at the normal position on the shaft of the little finger of the golfer's hand which is farthest away from the club head, and in which the perimeter of the gripping area increases progressively in a taper in the direction of the club head. The greatest perimeter of this tapered portion is reached in the area of normal placement on the grip of the ring finger of the golfer's hand farthest from the club head. The greatest perimeter of the grip may be held constant throughout the area of placement of the golfer's hands on the grip or as described below the perimeter may be varied at selected portions along the length of the grip. In the area of the hand position closest to the club head, the sides

of this novel grip can be given a moderate degree of flatness.

By using this golf club grip, the golfer's hand farthest from the club head maintains a firm grasp on the club throughout the swing because the taper of the grip conforms with the size of that hand. With this grip the golfer transmits a substantial force to the club at impact with the ball using the hand which grasps the club closest to the club head. This is accomplished because the force is applied by that hand over a large grip area affording that hand a substantial portion to grasp and insuring that at the moment of impact of the club head with the ball that hand will be secure on the grip thereby effecting proper alignment of the face of the club head to the line of flight of the ball. The moderately flat sides of this grip in the area of the position of the golfer's hand closest the club head further facilitates the application of force in the hitting area and proper alignment of the club head at impact with the ball.

Broadly, the present invention comprises a molded golf club grip having therein a channel disposed lengthwise of the grip. The shape of the channel conforms generally with that of the golf club shaft upon which the grip is to be mounted and the perimeter of the channel is the same as or smaller than that of the shaft along the length of the channel. For example, in one embodiment of the invention, a shaft having a circular cross-section will have mounted thereon a molded grip containing a central channel. Before the grip is mounted on the shaft, the diameter of the channel at any point along its length is the same as or smaller than the diameter of the shaft at that point. Preferably, the diameter of the channel is smaller. This brings about a snug fit between the molded grip and the shaft, and more importantly permits the production, from a single set of mold halves having fixed mold-cavity dimensions, of a set of molded grips that have outer dimensions that differ from each other when mounted on identical shafts.

Because the diameter of the annular channel in the grip is generally less than that of the shaft, the outer dimensions of the molded grip expand and increase when the grip is slipped onto the shaft. I have found that the outer dimensions of the grip, in its entirety or at any portion along its length, can be varied by changing the diameter of the annular channel in its entirety or at any corresponding portion along its length. For example, if a right-handed player requires for his three-iron a larger grasping surface for his right-hand than he does for the nine iron, I reduce the diameter of the grip's annular channel along that part of its length corresponding to the right-hand grasping portion of the grip for the three iron. When this molded grip is slipped onto the shaft, the expansion of the grip will be greater in that right-hand portion where the channel diameter has been reduced. Thus, by suitably decreasing or increasing the channel diameter along its entire length or selected portions thereof, I effect a corresponding increase or decrease in the outer dimensions and size of the grip along its entire length or at selected portions thereof.

The molded golf club grips of the invention are produced by molding the same in mold halves having fixed mold cavity dimensions. The mold halves are prepared, for example, by first creating a hob or pattern having an external configuration corresponding in general with that desired in the molded grip. The hob is case hardened in the usual fashion and is then suitably pressure forced the proper distance into the mold metal of each of the mold halves to form the mold cavity. A set of mold halves may contain a plurality of identical mold cavities in order to mold several grips at once.

The grip is molded to contain a channel throughout its length. This is accomplished by the utilization of a

removable core pin disposed lengthwise throughout the length of the mold cavity. The shape and size of the core pin will determine the corresponding shape and size of the channel. Thus, I produce an annular channel of diameter less than that of the mounting portion of a golf club shaft by molding the grip about a core pin having an external diameter smaller than that of the said shaft portion.

I have found that by changing the diameter of the core pin, I am able to vary the grip's channel diameter and hence the outer dimensions of the molded grip. A reference diameter of the core pin is selected and is chosen to be smaller than that of the portion of the golf club shaft upon which the golf club grip is to be mounted. This causes an expansion of the outer dimensions of the grip when it is slipped onto the shaft.

I have found that if the diameter of the core pin is reduced below the reference diameter, the grip, when mounted upon the shaft, will expand more and thereby increase the outer dimensions of the grip. By increasing the diameter of the core pin beyond that of the reference diameter, I am able to decrease the expansion of the grip, upon mounting, thereby producing a golf club grip having a smaller outer dimension then would result by use of the reference diameter. Thus, one mold will yield an infinite variety of grip sizes.

I have also found that it is desirable to taper the core pin in such a manner that its diameter is reduced or increased at selected points along its length. For example, by reducing the diameter of the core pin, and hence that of the channel diameter, in that part of the grip corresponding to the right-hand gripping portion, I have found that the molded grip, when mounted on the shaft, will have a slightly larger external dimension in the said right-hand gripping portion. The same variations can be effected for the left-hand gripping portion or any selected portion or portions of the grip. In this manner, molded golf club grips of different sizes can be custom-made for any particular golfer's hand size and club usage.

The above discussion has assumed a constant shaft diameter. If it should be desired to mount the golf club grips of this invention upon a shaft having a non-uniform external shape and size, this can be accomplished by effecting suitably corresponding changes in the configuration of the core pin.

Other objectives will be apparent from the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a side elevation of a golf club grip embodying the invention, with a portion broken away to show more clearly the construction;

FIGURE 2 is a top elevation of the grip shown in FIGURE 1;

FIGURE 3 is a sectional view along the plane indicated by the line 3—3 of FIGURE 1;

FIGURE 4 is a sectional view along the plane indicated by the line 4—4 of FIGURE 1;

FIGURE 5 is a sectional view along the plane indicated by the line 5—5 of FIGURE 1;

FIGURES 6 through 11 are schematic sectional and partially sectional views of unmounted and mounted grips embodying the invention and as viewed along the centerline of FIGURE 2. Each of the FIGURES 6, 8 and 10 shows a similar portion of an unmounted molded grip embodying the invention. The molded grips shown in FIGURES 6, 8 and 10 have the same exterior dimensions and shape, but have different shapes and dimensions along the length of their interior longitudinal channels. FIGURES 7, 9 and 11 respectively show the molded grips of FIGURES 6, 8 and 10 when mounted upon the golf club shaft. FIGURES 7, 9 and 11 illustrate the changes in exterior grip dimensions and shape that take place upon mounting grips, as shown in FIGURES 6, 8 and 10 having identical exterior shape and dimensions but differing dimensions and shapes along the interior longitudinal channels.

Referring to FIGURES 1 and 2, on golf club shaft **20** is mounted molded grip **21** having end portion **22** farthest from the club head, not shown, and end portion **23** closest to the club head. Grip **21** is comprised of a first portion is *f—f*; the portion for hand which grasps the club closest than the said first portion. The portion of grip **21** for the hand which grasps the club farthest from the club head is *f—f;* the portion for hand which grasps the club closest to the club head is *g—g*. The embodiment of the invention shown in these drawings illustrates a grip of substantially circular cross section. In the portion *g—g* of grip **21**, the sides **24** may be slightly flattened. It will be understood that there may be the usual overlapping or interlocking of the golfer's hands in the vicinity of the juncture of portions *f—f* and *g—g*.

The broken away portion of FIGURE 1 shows more clearly the construction of grip **21** when mounted on shaft **20**. From end portion **22***a* of first gripping portion *f—f*, the grip has a progressively increasing exterior perimeter **25***p*–**25***q* in the sub-portion *h—h* of portion *f—f*. This relatively abrupt increase in exterior perimeter permits the little and ring fingers of the hand which grasps the club in the portion *f—f* to maintain a firm grasp around sub-portion *h—h* throughout the swing and especially at the top of the backswing, and at the same time provides the middle and index fingers of that hand with a substantial gripping area in portion *f—f* in order to facilitate imparting the necessary force to the club so as to permit that hand to control the swing.

The progressively increasing exterior perimeter **25***p*–**25***q* further cooperates with the gripping portion *g—g* for the hand which grasps the club closest to the club head, for example, the right hand of a right-handed golfer. The accuracy and power of the golf swing is dependent upon the interaction of the force imparted to the club by both of the golfer's hands. The provision, in portion *g—g*, of a substantial grasping area for the right hand insures that at the moment of impact of club head with ball the right hand will be secure in proper position on the grip. This enables the right hand to impart great force to the club. At the same time, the reduced perimeter in sub-portion *h—h* enables the little and ring fingers of the left hand to remain firmly clasped about the grip to assure the proper square alignment of the club face to the line of flight of the ball. Flattening of the sides **24** in portion *g—g* facilitates the proper positioning of the right hand in these respects.

Referring to FIGURE 3, golf club shaft **20** has mounted thereon grip **21** having exterior perimeter **25***p*. The structure of sub-portion *h—h* wherein the exterior perimeter progressively increases along the length of the said sub-portion is further illustrated by reference to FIGURE 4.

Referring to FIGURE 4, golf club shaft **20** has mounted thereon grip **21** having exterior perimeter **25***q*. It is readily seen that the said perimeter **25***q* is greater than the exterior perimeter **25***p* in FIGURE 3.

Referring to FIGURE 5, golf club shaft **20** has mounted thereon grip **21** having flattened side portions **24**. These flattened side portions **24** aid in proper alignment of the golf club with respect to the golfer's hands and the ball.

Referring to FIGURES 6 and 7, unmounted grip **30**, having portion *f—f* for the hand which grasps the club farthest from the club head and portion *g—g* for the hand which grasps the club closest to the club head, has interior channel **31** extending longitudinally along the length of the grip. The dimensions and shape of the channel **31** conform to, but are slightly smaller than, those of the golf club shaft **32** upon which grip **30** is to be mounted. In the embodiment of the invention illustrated in the drawings, the grips are mounted upon a portion of a golf club shaft of circular cross section and constant diameter

y. The interior diameter x of channel **31** is selected to be slightly smaller than diameter y of shaft **32**. Diameter x will hereinafter be referred to as the reference diameter.

Since reference diameter x is smaller than shaft diameter y, the resilient material of the grip expands upon mounting on shaft **32**, and, since the reference diameter x was uniformly smaller than the shaft diameter y, the resultant expansion of grip **30** is substantially uniform along the length of the grip. If it is desired to increase the expansion of grip **30** upon mounting, the diameter of channel **31** is chosen to be smaller than reference diameter x; and conversely, increasing the diameter of channel **31** beyond the reference diameter x decreases the expansion of the mounted grip.

The increase or decrease of the diameter of channel **31** above or below the reference diameter x need not be uniform along the length of channel **31**, and in some instances it is particularly desirable to vary the diameter at selected portions along the length of the channel **31**.

Referring to FIGURES 8 and 9, the diameter of channel **31** is reduced selectively below the reference diameter x in the sub-portion *h—h* of portion *f—f*. Hence, when the grip is mounted on shaft **32**, the expansion of grip **30** in subportion *h—h* will be relatively greater than in the remainder of the grip. This selectively greater increase (or decrease if the channel diameter is increased) of exterior dimensions of grip **30** in sub-portion *h—h* is of particular importance and value because the golfer's hand holding the club farthest from the club head is especially sensitive to a change in grasping area for the little and ring fingers. This structural feature of my invention enables the production, from a mold cavity of fixed shape and interior dimensions, of golf club grips individually and selectively adapted to the dimensions of the hands of any individual golfer.

FIGURES 10 and 11, illustrate further this feature of my invention. The diameter of channel **31** is varied selectively and differently in grip portions *f—f* and *g—g*. In the portion *f—f*, the diameter is progressively reduced from the reference diameter x in the vicinity of the juncture **33** of portions *f—f* and *g—g* to a minimum diameter in the vicinity of that part **34** of portion *f—f* which is farthest from the club head. In the portion *g—g*, the diameter of channel **31**, is progressively reduced from the reference diameter x in the vicinity of the said juncture **33** to a minimum intermediate of the said juncture and the part **35** of portion *g—g* that is closest to the club head so that the interior channel longitudinal cross section is slightly convex. When this grip is mounted on shaft **32**, the correspondingly selective variations in exterior grip dimensions and shape that occur in portions *f—f* and *g—g* are illustrated in FIGURE 11.

The golf club grips of this invention may be molded, for example, from a natural rubber blended stock. The stock is extruded into preforms which are placed in the mold halves having thereinbetween a metal core pin, having a shape and exterior dimensions corresponding in general with those desired in the longitudinal interior channel of the mold grip. The quantity of preform placed in the mold varies with desired grip hardness and interior channel dimensions; for a harder grip more fillers are added increasing the weight of the charge. For a typical grip, 85 grams of preform material are molded for six minutes at 340° F. at a pressure of 1,000 p.s.i. to form the molded grip.

The variations in shape and dimensions of the interior longitudinal channel in the molded grip, as illustrated in FIGURES 6, 8 and 10 are brought about by utilizing core pins of different shapes and sizes. This is most conveniently done by machining a metal core pin or rod on a lathe or similar device until the desired shape and dimensions are attained. A typical core pin used to mold a

grip as illustrated in FIGURES 1, 2, 8 and 9 has a length of about 13 inches, 7 inches of which correspond with the combined length of grip portions *f—f* and *g—g*. The core pin diameter corresponding with reference diameter x of channel **31** in FIGURE 8 may be e.g., 0.550 inch and progressively decreasing to 0.470 inch at a point corresponding with part **34** of portion *f—f* which is farthest from the club head. This progressive diameter reduction takes place within approximately 0.75 inch, axially, along the length of the core pin. The interior dimensions of the longitudinal channel in the molded grip may readily be computed, if desired, by utilizing a correction factor for rubber shrinkage, upon molding, of approximately 0.02 inch per inch of rubber.

Although the invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of the construction and combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A golf club comprising in combination a club head, a shaft and a grip mounted on said shaft; wherein:

said grip comprises a first gripping portion farthest from the club head, adapted to be grasped by one of a golfer's hands, a second gripping portion adapted to be grasped by the golfer's other hand, and a longitudinal interior channel receiving said shaft; wherein

said first gripping portion comprises a tapered sub-portion having a relatively abrupt increase in exterior perimeter from a minimum, at the end of said sub-portion coincident with the end of the first gripping portion remote from said club head, to a maximum, intermediate the ends of said first gripping portion, the longitudinal length of said tapered sub-portion being substantially equal to the width of the little finger and a portion of the width of the ring finger of the hand grasping said sub-portion, and the maximum perimeter of said first gripping portion being no greater than the maximum perimeter of said sub-portion.

2. The golf club of claim **1**, wherein the maximum perimeter of said sub-portion is maintained throughout the remainder of the first gripping portion as a substantially uniform perimeter.

3. The golf club of claim **1**, wherein the radial thickness of said grip comprises at least one variation within at least one of said first and second gripping portions, exclusive of said sub-portion, whereby the external perimeter of said grip defines a custom contour.

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DELBERT B. LOWE, *Primary Examiner.*

G. J. MARLO, *Assistant Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,295,850 January 3, 1967

John K. Garrity

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, lines 7 and 8, strike out "is f-f; the portion for hand which grasps the club closest than the said first portion", and insert instead -- f-f and a second portion g-g closer to the club head than the said first portion --.

Signed and sealed this 26th day of September 1967.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents