GOLF CLUB LIE ANGLE APPARATUS

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This invention relates generally to the class of apparatus for establishing the angle of lie of a golf club, and is more particularly concerned with apparatus for establishing the correct angle of lie of a particular club for an individual golfer.

In my prior patent application for golf club calibration device, Serial No. 503,516, filed April 25, 1955, I have disclosed apparatus for calibrating the loft or lie or both of a type of golf club known as an iron. The apparatus, and the method of utilizing the apparatus for imparting a proper loft and lie angle set to golf clubs, as disclosed in that application, depends on the initial determination of lie angle for a particular club. The lie of a golf club determines very definitely whether the player will hook, slice or hit a straight ball, hence is one of the most important calibration factors in a set of clubs.

After the initial determination of such lie angle for that particular club, the apparatus is set to that angle of lie, the club clamped in the machine comprising the apparatus and thereafter calibrated to that lie angle. The club may also be given simultaneously the proper loft angle calibration. Subsequently, all the irons in the set may be calibrated.

It is thus seen that a critical factor is the initial determination of angle of lie for a particular club, since proper angle of lie for all other clubs in the set depends wholly on the correctness of initial determination. As disclosed in that application, it was shown that one method for the initial determination can be accomplished by having the golfer grasp the club in the usual manner and assume his position as if to hit the ball. The lie angle of the club is then observed (by a golf "pro," for example), and if the club head toes down or toes up by more than a degree or so, a correction is made by clamping the club head in the machine and applying corrective bending action to the hosel of the club head. After the bend is made, the club is removed from the machine and again checked with the golfer.

It should be noted the initial determination according to this method may require one or more bend-and-try operations before the lie angle for that particular club is more or less accurately established.

I have now devised apparatus which does away with the necessity for bend-and-try procedures with the club. The novel apparatus about to be described will provide an actual and accurate measure of the correct lie angle for a particular club, which angle may then be transferred to the calibration machine for the purpose of calibrating an entire set of clubs. It should be noted that the apparatus of the present invention does not require the presence of the calibration machine in order to establish the correct lie. The apparatus is light weight and of nominally small bulk. Furthermore, it is comparatively low in cost of manufacture and can be made readily available to golf professionals' shops. Thus one calibration machine, which is heavy, bulky, and relatively costly to procure, may be utilized in one central location to provide calibration service for several apparatuses according to the present invention located in various nearby pro shops.

An important advantage is that the correct angle of lie is quickly and easily established and indicated on the apparatus without the need for personal observation of the position of a club head by another person. Thus, the information is obtained first hand, not second hand.

It is an object of this invention, therefore, to provide apparatus which will establish and indicate the correct measure of lie angle for any individual golfer so far as it pertains to any selected club.

It is a particular object to provide apparatus by way of a shaft-like device arranged to simulate a golf club in general configuration and weight and which may be gripped by a golfer in the usual ball hitting position at which the golfer usually arrives at the instant of impact between the usual club head and ball. The apparatus further comprises a stand-like device which is juxtaposed adjacent the shaft-like device, the stand being provided with a scale of lie angle units. The shaft-like device is provided with a pointer means which indicates on the scale the angle of lie.

It is a further object to provide the shaft-like device by way of a pair of tubular members which are axially adjustable, one within the other, and securely fixable at any selected overall length, one end of the device being provided with a handle grip after the fashion of a golf club, the other end being provided with a point, preferably, which may be utilized in cooperation with a reference point on the stand-like device. The shaft-like device is also provided with an indicator or pointer means intermediate the ends of the device, which indicator or pointer means cooperates with the lie angle scale on the stand-like device to indicate correct angle of lie.

It is a still further object to provide a safety retainer secured to one of the aforesaid tubular members and arranged to cooperate with a portion of the other of the tubular members to prevent total disengagement between the members. This is a desirable feature to prevent the far member from salling off if the golfer swings the shaft-like device, as an enthusiastic golfer might be inclined to do.

Other and further objects will be apparent upon consideration of the description to follow when referenced to the accompanying drawings in which

FIG. 1 is a front elevation view to illustrate a golfer in the hitting position;
FIG. 2 is a side elevation view, similar to FIG. 1;
FIG. 3 is a perspective view to illustrate the use of the invention by a golfer to enable him to establish the proper angle of lie;
FIG. 4 is a side elevation view of the stand means;
FIG. 5 is a front elevation view of the stand means;
FIG. 6 is a fragmentary view of the stand means taken along the line 6—6 of FIG. 4, showing more particularly the scale of lie angle units, the shaft means being indicated in dot-dash lines to show the relationship of the pointer;
FIG. 7 is a plan view, partly in section, of the shaft means; and
FIG. 8 is a fragmentary view of part of the shaft means taken on the line 8—8 of FIG. 7.

Referring to FIG. 1, a golfer is illustrated in the hitting position at the instant of impact between club head and ball. This position is to be distinguished from the static position assumed by the golfer when he first addresses the ball prior to the back swing which precedes the hitting position.

Generally, when the golfer addresses the ball, he distributes his weight equally on both feet and assumes a position with shoulders and hips square to line, the left shoulder (for right-handed golfers) being only slightly higher than horizontal. As he addresses the ball, the hands do not lead the ball much, if at all.

However, as he comes into the hitting position, it will be found that his body turn is partly completed, weight is shifted to the left foot, arms are straight with wrists uncorked and left arm and club shaft forming a continuous line from shoulder to ball. Also, it will be found that
his left shoulder is higher due to the partially completed turn and that his hands are usually leading the ball.

Angle of lie may vary as between the hitting position and the position of address. Therefore, it is preferable in the practice of this invention to obtain the correct angle from the dynamic hitting position rather than from the static position of address.

Referring to FIG. 2, it will be seen that the angle of lie is comprised between the axis of the shaft and the ground.

In FIG. 3, the golfer is shown in a position similar to that depicted in FIGS. 1 and 2, except that, instead of the hitting position with the club, the golfer has assumed that position with the apparatus 10 according to the present invention. The apparatus 10 comprises a stand-like means or device 11 and a shaft-like device 12. The stand means 11, as better seen in FIGS. 4, 5, and 6, comprises a quadrant member 13 supported in an upright position by a transversely disposed foot member 14 secured to the former by the screws 15. The quadrant member 13 includes an arcuate portion 16 spaced from the foot member 14 by vertical and horizontal bar portions 17 and 18, respectively. It will be appreciated that the quadrant member may be a solid plate if desired. However, it is preferred to fabricate it as shown, preferably of light-weight metal as an economy measure and to assure portability.

The peripheral face 19 of the arcuate portion 16 lies on an arc defined by a radius from the bottom inner edge 20 of the foot member 14 (FIG. 4), the edge 20 defining index marks 21 and 22 on each side of the quadrant 13. The index mark 21 is utilized in the case of right-handed golfers, while the mark 22 is for use in connection with left-handed golfers, as will be more particularly pointed out below.

Secured to the peripheral face 19 by means of screws 23 and 24 is a scale 25 suitably engraved with lie angle units. Preferably these are in the familiar units of angular degrees as measured upwardly from the bottom of the stand 11 about the edge 20 of the foot member 14.

The arcuate portion 16 has secured to each of its sides faces thin strips of soft steel or other magnetic material of low magnetic retentivity. One of these strips is shown at 26, secured to the face by screws 27 and 28. A similar strip 29 is secured in the same manner to the other side face of the arcuate portion 16.

The shaft means 12 is comprised generally of tubular member 30 which is slidably disposed within the tubular member 31. The outer member 30 is provided at the outer end with a hand grip 32 fashioned to simulate the usual hand grip of a regular golf club. The other end of the tube 30 is crimped or spun inwardly, as shown at 33. Intermediate the ends of the tube 30 the upper face thereof is provided with inch, half-inch, and quarter-inch marks 34. The inch marks may have numerals alongside which cover the range from thirty to forty-eight inches, the standard range of club shaft lengths.

The lower end of the outer tubular member 31 has secured to it by means of a rivet 35 a pointed element which is bored and threaded to receive a rod member 37 securely therewith. The rod 37 is provided with a head 38, preferably slotted so that a screw-driver may be employed to drive the rod 37 into the pointed element 36. The slotted head 38 is of such size as to be slidably received within the tubular member 30, yet will not pass by the crimped end 33. That is, the outer member 31 from flying off the inner member 30 if the golfer should swing the shaft means 12 too wildly.

The upper end 39 of the member 31 is slotted for a short distance downwardly, as at 40, preferably on a diametrically opposite side of the member 31. The end 39 is tapered to be engaged by the internally tapered surface 41 of a nut 42 threadably engaged with corresponding threads 43 on the tubular member 31. Thus by tightening the nut 42, the interior surface of the upper portion of the tubular member 31 is caused to grip the exterior surface of the tubular member 30 and secure the two tubular members against relative sliding or turning movement.

A pair of collars 44 and 45 are disposed adjacent the upper end of the tubular member 31 in fixed relation thereto and serve to position a pair of magnet holders 46 and 47 which may be cemented or otherwise secured to the member 31. Ends 48 of the magnets contained by the holders 46 and 47 are exposed and extend outwardly a small distance beyond the outer peripheries of the collars 44 and 45. The magnets are loosely secured within the holders, as by a small rivet, one of which is shown at 49 in FIG. 7.

Secured to the tubular member 31 immediately above the collar 44 is another collar 50 which is provided with a thin flat gage member 51. It should be noted that the distance from the end of the pointed element 36 to the lower edge of the gage 51 is just slightly greater than the radial distance from the edge 20 of the foot member 14 to the surface of the angle scale 25 on the arcuate portion 16 of the stand means 11. It will also be observed that the gage 51 extends radially from the shaft means 12 in the same direction as the outstanding magnet ends 48.

The utilization of the apparatus 10 will now be explained. Preferably, this is done with the aid of the golf professional, who is best qualified to assist the golfer in assuming the hitting position with the shaft means 12.

Firstly, a decision is made as to which club of the numbered set of irons is to be the basis for the basic angle of lie to which all the clubs are to be calibrated. Usually the decision will be based on the #5 iron since it is midway in the set. On the other hand, the golfer may have a preference in his particular set of irons for the #4 or #6 club as being his "sweetest" club with the most natural swing. In any event, the decision is arrived at as between the golfer and the pro.

After selecting the particular club for the basic angle of lie determination, the nut 42 on the tubular member 31 is loosened sufficiently so that the tubular member 30 may be slid in member 31 until the inch, half-inch, or quarter-inch mark, which corresponds to the length of the selected club, shows just above the upper end of the nut 42, after which the nut is tightened.

Then, standing on a level surface, the golfer grips the shaft means in the same manner he would with the selected club and assumes the hitting position with the assistance of the pro. As a practical matter, the golfer may take a few preliminary swings with the selected club before assuming the hitting position with the shaft means. This helps him to limber up, and he can then assume the correct hitting position without tension or stiffness.

After the pro is satisfied the golfer is in the correct position, the pro then moves the stand means over to the vicinity of the shaft means and carefully slides the stand until the mark 21 on the bottom inner edge 20 of the foot member 14 is adjacent the point of the pointed element 36 of the shaft means, and with the magnetic strip 26 adjacent the magnetic ends 48. At this point the magnet sets will be attracted to the strip 26 and will serve to hold the shaft means in position with the gage 51 overlaying the scale 25. The correct angle of lie is indicated on the scale by the gage.

The procedure is aptly illustrated by FIG. 3.

Preferably three or four trials are made since it will be found that there is a slight variation from one trial to another. The angles indicated by the several trials are then averaged, after which, as a final step, the average angle is transferred to the lie angle scale on the calibration machine mentioned in the first part of this specification.

The foregoing mode of operation has been described in connection with the use of the apparatus for measuring the angle of lie for a right-handed golfer, in which case the shaft means is grasped by the golfer in a manner such that the pointer gage member 51 points to his left. This is the direction of ball flight for a right-handed golfer.
In the case of a left-handed golfer, the shaft means is grasped with the member 51 pointing to his right. In other words, the shaft means is merely turned over. The golfer is then placed in the hitting position and the stand means moved over to the vicinity of the shaft means where the point of the pointed element 36 is adjacent the index mark 22 and the magnetic strip 29 adjacent the magnet ends 48. The magnets will be attracted to the strip 29 and thereby hold the shaft means in position with the gage 51 immediately above the scale 25.

While the invention has been described in connection with a preferred embodiment thereof, it will be appreciated that variations of the structures illustrated and described are well within the scope of those skilled in the art, and it is the intent that all such design variations are contemplated as within the coverage provided by the subjoined claims.

I claim:

1. Apparatus for establishing the correct angle of lie for a golfer's club, comprising: shaft means comprised of a pair of tubular members, one being axially adjustable and fixable within the other, said shaft means being provided at one end with hand grip means, the configuration and weight of said shaft means being such that it simulates the feel of a golf club when grasped by said hand grip means, whereby said golfer may grasp said shaft means in the manner of a golf club and cause said shaft means to simulate the hitting position of a golf club at the instant of impact between club and ball, the other end of said shaft means terminating in a tapered element defining a point; gage member pointer means secured on said shaft means intermediate the ends thereof; and stand means comprised of uprightly disposed portions, one of said portions defining a substantially vertical face when said stand means is disposed on a level surface, said one of said portions being provided with a scale of lie angle units defined by a reference point distally disposed from said scale, the angle of lie being indicated by said pointer means on said scale when the golfer has simulated the hitting position with said shaft means and said stand means is juxtaposed with said uprightly disposed portion adjacent said shaft means with said point at said other end thereof coinciding substantially with said reference point of said stand means.

2. Apparatus for establishing the correct angle of lie for a golfer's club, comprising: shaft means comprised of a pair of tubular members, one being axially adjustable and fixable within the other, said shaft means being provided at one end with hand grip means, the configuration and weight of said shaft means being such that it simulates the feel of a golf club when grasped by said hand grip means, whereby said golfer may grasp said shaft means in the manner of a golf club and cause said shaft means to simulate the hitting position of a golf club at the instant of impact between club and ball, the other end of said shaft means terminating in a tapered element defining a point; gage member pointer means secured on said shaft means intermediate the ends thereof; and stand means comprised of uprightly disposed portions, one of said portions defining a substantially vertical face when said stand means is disposed on a level surface, said one of said portions being provided with a scale of lie angle units defined by a reference point distally disposed from said scale, the angle of lie being indicated by said pointer means on said scale when the golfer has simulated the hitting position with said shaft means and said stand means is juxtaposed with said vertical face adjacent said shaft means with said point at said other end thereof coinciding substantially with said reference point of said stand means.

References Cited by the Examiner

UNITED STATES PATENTS

397,500 2/89 Hadley -------------- 33—97

2,546,426 3/51 Bryant ----------------- 33—174

FOREIGN PATENTS

407,989 3/34 Great Britain.

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