

Attention is directed to the angles Ω shown in FIGS. 4 and 20, and a shown in FIGS. 5 and 22, and dimensions 21 and 23 shown in FIGS. 4, 5, 20 and 22. When these dimensions and angles are at particular values for the particular embodiment depicted, the golfer will achieve a shaft-to-forearm-angle β_{opt} when the training device is held in fixed relation to the golf club and the golfer has adjusted his wrist in such a way that tip 6 is gently touching the underside of his forearm.

As shown in FIGS. 4 and 20, the angle Ω is defined as the angle between the arc radius centerline axis 16 of interface 1, and axis 8a. Axis 8a is the projection of a line passing through the tip 6 and point 24, onto plane X-Y, as viewed in FIGS. 4 and 20. Point 24 is the point where the arc radius centerline axis 16 intersects with plane 18. Plane 18 is an imaginary plane residing in the Y-Z plane, that contains inter-finger portion 2, as illustrated in FIGS. 4 and 5. Typical value for Ω is 40 degrees \pm 5 degrees. Length 21 is the length of axis 8a between tip 6 and point 24, as illustrated in FIGS. 4 and 20. Length 21 is typically 5.2 inches \pm 0.25 inches.

As shown in FIG. 21, angle Ω can, to a good approximation, be alternatively defined as the angle between a) the shortest line between point 24 and tactile feedback member 5, denoted 41, and b) a line 42 passing through tip 6 and point 24.

As shown in FIGS. 5 and 22, the angle α is defined as the angle between the arc radius centerline axis 16 of interface 1 and axis 8b. Axis 8b is the projection of a line passing through the tip 6 and point 24, onto plane X-Z, as viewed in FIGS. 5 and 22. Typical value for α is 16 degrees \pm 5 degrees. Length 23 is the length of axis 8b between tip 6 and point 24, as illustrated in FIGS. 5 and 22. Length 23 is typically 3.85 inches \pm 0.25 inches. When the training device is held in place on the golf club, the arc radius centerline axis 16 is substantially collinear with golf club shaft axis 9 as illustrated in FIG. 8.

As shown in FIG. 23, angle α , can, to a good approximation, be alternatively defined as the angle between a) the shortest line between point 24 and tactile feedback member 5, denoted 41, and b) arc radius centerline axis 16.

Club interface 1 is designed in such a way so as not to significantly interfere with the golfer's standard grip, allowing the golfer to have a firm hold on the golf club. This characteristic of club interface 1 is a result of the interface's design, including an arc shape similar to the golf club grip, a thin profile, and a length 12 along the grip 11b, as illustrated in FIG. 6, that will be as small as possible to limit interference with the golfer's grip while providing enough contact to insure that the training device does not slip or move during the execution of the golf swing. The arc shape has a radial arc angle, ψ , as illustrated in FIG. 7. Arc angle, ψ is less than 180 degrees so that hand pressure is required to keep the device in place. Arc angle, ψ is typically between 100 and 120 degrees. The inter-finger section 2 is designed to fit between the fingers of the golfer when a standard grip is taken by the golfer and has a cross section similar to H-H, illustrated in FIG. 1a, that fits comfortably between the bottom two knuckles so that there is limited disruption of the golfer's grip as compared to a grip without using the training device. The inter-finger section 2 is designed to have maximum thickness within the design envelope, in order to maximize the strength of the section. Typical thickness at the thickest location in section H-H is 0.14 inches. Club interface 1 has angled edges at an angle λ as projected onto the X-Y plane, as seen in FIG. 6, to keep the interface substantially parallel to the user's middle and ring fingers in that area when the device is being used. Typical value of λ is 4 to 6 degrees. The member section 2 is oriented at angle φ , relative to line 31 which is parallel to the interface 1 centerline axis, as projected onto the X-Y plane as

seen in FIG. 6. The angle φ , is designed to match the orientation and location of the user's fingers when the device is being used. Typical value for φ , is 80 to 85 degrees. Club interface 1 may have a contoured outer surface to match the contours of the finger surfaces to further limit any disruption of the golfer's grip.

Some typical dimensions of the first embodiment are detailed in FIG. 4, and are as follows. ξ is the angle at which members 4 and 5 protrude from member section 3, relative to axis 8a, and is approximately 35 degrees. The length of member 5, defined as 14, is approximately 4.35 inches long. The length 26 of the portion 4 of member 5 that is exposed with two ridges showing is approximately 0.30 inches. Ridge spacing, 4a, is typically 0.15 inches. The width of member 5 is defined as 28, and is approximately 0.60 inches. The distance from the base of member 2 to the base of member 4 is defined as 27, and is approximately 3.60 inches. The distance from the arc radius centerline 16 to the base of member 2 defined as 32, and is approximately 1.98 inches. The diameter of member 4 at the outer ridge location, 4b, is typically 0.55 inches.

Some additional typical dimensions of the first embodiment are detailed in FIG. 5. The width of member section 3 is defined as 29, and is typically 0.79 inches.

FIG. 11 illustrates the training device held securely to the golf club prior to the golfer setting shaft-to-forearm angle β to the value imposed by the training device. When the golfer is in this position, the golfer can adjust the club head hitting surface radial orientation relative to the training device by rotating the club about its longitudinal axis. The golfer then sets the shaft-to-forearm angle β to the optimal shaft-to-forearm angle β_{opt} , and then bends the knees and lowers the arms until the club head touches the ground. At this point as illustrated in FIG. 12, the golfer will be in the address position.

FIG. 13 illustrates one of the functions of the present invention related to the swing take-away. As the golfer begins the golf swing after using the tactile feedback provided by the device to set the shaft-to-forearm angle β at address to β_{opt} that angle is maintained during the take-away until the point in the swing at which the golfer rotates the wrists and thereupon breaks contact between the tip 6 and leading forearm 7. The device will not contact the forearm for the remainder of the backswing and the first part of the downswing.

It is desirable for tactile feedback member 5 to deflect relative to the training device as a whole at the point in the downswing when a lateral force is applied to the tactile feedback member 5 upon its contacting the leading forearm 7 as illustrated in FIG. 14. To this end, tactile feedback member 5 may be made out of flexible material, such as rubber or foam rubber, or designed as a rubber cylinder with a closed end. A flexible tactile feedback member 5 flexible enough to allow its present function, does not apply significant force to the forearm when tactile feedback is given, nor does it significantly interfere with the swing. Alternatively, tactile feedback member 5 may be a rigid member with a spring loaded joint located at the base of the member.

There are a number of benefits resulting from the training device being held in place by the golfer's hand(s) as opposed to being secured by a clamp or the like, making this a particularly advantageous feature. Firstly, this feature makes it more convenient, and less obtrusive and not at all time-consuming to alternate one's use of the device among multiple clubs, as compared to having to disengage the training device from one club and re-engage it on another. On the golf course, having to take time to attach a device to a club is cumbersome, and golfers may be less likely to actually use the devices while on a golf course because they do not wish to be seen attaching a