

11

device or been seen using non-standard clubs, or simply because it is a hassle to attach and remove.

Yet another advantage is that since the training device is held in place under the golfer's hands, the present training device changes how the swing feels to the player to a much lesser extent than if it were attached at, say, a point beyond the hands of the golfer, thereby adding mass to the club at a point along the shaft that might make the swing feel different due to the change in the resulting moment of inertia of the golf club and device.

Yet another advantage is that the interface can be easily designed, by the virtue of the varying arc radius ϕ_1 to ϕ_2 , to allow the point at which the training device can be held in place at different points along the golf club grip, enabling the golfer to 'chock up' when desired while still using the device.

Yet another advantage is that, unlike some prior art devices, the present training device does not interfere with, or force particular body or arm positions during, a golfer's normal swing, nor does it prevent the golfer from taking a full, relatively undisrupted swing in the same way as a swing without the device.

A further embodiment of a training device embodying the principles of the present invention is shown in FIG. 15. This embodiment is similar to that shown in FIG. 1 except that that the training device of FIG. 15 includes an adjustment ball and socket type joint 13 that allows the golfer to change the angles Ω and α , and the corresponding angle β , at address. The adjustment joint allows for changing angle β for certain specialty shots including the putting stroke with a putter. It also allows the golfer to change the contact point on the forearm, change the golfer's preferred address angles, or to have the tip contact the user's trailing forearm 15 as shown in FIG. 3. The device contacting the trailing forearm is illustrated with dashed lines 19 in FIG. 3. A golf swing training device embodying the principles of this invention can have any type of joint or combination of joints or location of joint that will allow changing of the design angles.

A further embodiment of the present invention is shown in FIG. 16. This embodiment is similar to that shown in FIG. 1 except that that the training device is permanently attached to the golf club, such as by being embedded in the end of the shaft, as shown in FIG. 16. The training device could, in fact, be designed to be attached or integrated at any location on the golf club.

A further embodiment of the present invention is shown in FIG. 17. This embodiment is similar to that shown in FIG. 1 except that in the training device of FIG. 17 the club interface is removably affixed to the golf club, such by means of a clamp as shown in FIG. 17, thereby allowing removal of training device for use on multiple golf clubs. The training device could be attached at any point on or below the golf club grip. Another embodiment of the present invention is shown in FIG. 18, which illustrates the training device integrated with a glove that would be worn on the golfer's leading hand.

A further embodiment of the present invention is shown in FIG. 19. In this embodiment the device is held in fixed relation to the user's forearm, with a flexible member that contacts the user's hand when a wrist radial deviation or shaft-to-forearm angle β is achieved.

The foregoing merely illustrates the principles of the invention and numerous variations are possible.

For example, a golf swing training device embodying the principles of this invention can have any desired configuration of the interface and guide member sizes shapes and orientations, to locate the contact tip 6 in a location that will create particular values of angles Ω and α , and dimensions 21 and 23, that will ultimately allow a golfer to use the training

12

device to achieve multiple values of the shaft-to-forearm angle β , or multiple values of the wrist radial or ulnar deviation, during the address position.

Moreover, for embodiments in which the training device is to be secured to the golf club, this can be achieved by various means, such as by clamping or screw pressure, permanent attachment to the golf club, or attached to the end of the grip via a form-fitting cap type of interface that fits over the butt end of the shaft.

Moreover, a golf swing training device embodying the principles of this invention could include a device that is not oriented or used in conjunction with a golf club, but is used in itself to practice the feeling of achieving a desired shaft-to-forearm angle β , such as the angle β_{opt} .

Moreover other ways of providing an indication to the golfer a desired shaft-to-forearm angle or wrist radial or ulnar deviation has been achieved are within the spirit and scope of the invention and are commensurate with the present inventor's contribution to the art. Thus the present invention envisions that it may be possible to provide the desired indication using electronics rather than a strictly mechanical training device. To this end, those skilled in the electronics art might be able to devise sensor-based training devices that measure or otherwise detect the shaft-to-forearm angle β and provide aural, tactile (e.g. vibration) or other feedback indicating when the $\beta = \beta_{opt}$.

It will thus be appreciated that those skilled in the art will be able to devise numerous alternative arrangements that, while not shown or described herein, embody the principles of the invention and thus are in the spirit and scope.

The invention claimed is:

1. A device that provides a particular human-perceptible stimulus to a golfer when the golfer is holding a grip portion of a golf club with both of the golfer's thumbs extending along a shaft of the golf club, the device being configured to provide said particular human-perceptible stimulus only when a shaft-to-forearm angle δ between a centerline of a forearm of the golfer and a shaft of the golf club is at a predetermined value substantially between 145 degrees and 160 degrees,

wherein said device has an interface that can be held in contact with a particular portion of a golf club,

wherein said device is configured such that said stimulus is provided at a time when said interface is in contact with said particular portion of the golf club,

wherein said particular portion of the golf club is the grip of the golf club,

wherein said interface has a curved surface with a varying arc radius,

and wherein said device includes an inter-finger element that is attached to said interface and that is so configured that the inter-finger element can extend between adjacent fingers of a hand of the golfer when the golfer is using that hand to hold the curved surface of the interface in contact with the grip of the golf club.

2. The device of claim 1 wherein the device includes a forearm-contacting tip, wherein said particular human-perceptible stimulus is a perceptible amount of pressure exerted on the underside of a forearm of the golfer by the forearm-contacting tip, wherein the device is configured in such a way that the forearm-contacting tip exerts pressure on said underside of the forearm of the golfer only when said shaft-to-forearm angle β is at least said predetermined value, and wherein the device is further configured in such a way that, when said angle β is greater than said predetermined value, said tip exerts a higher amount of pressure on said underside of said forearm than said perceptible amount of pressure that