United States Patent

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[54] **TRAINING DEVICE FOR IMPROVING GOLFER'S SWING**
12 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **273/186,** 273/194
[51] **Int. Cl.** **A63b 69/36**
[50] **Field of Search** 273/193, 194, 186, 162, 167, 67, 26, 183; 46/77, 79, 80, 81, 74, 31, 17

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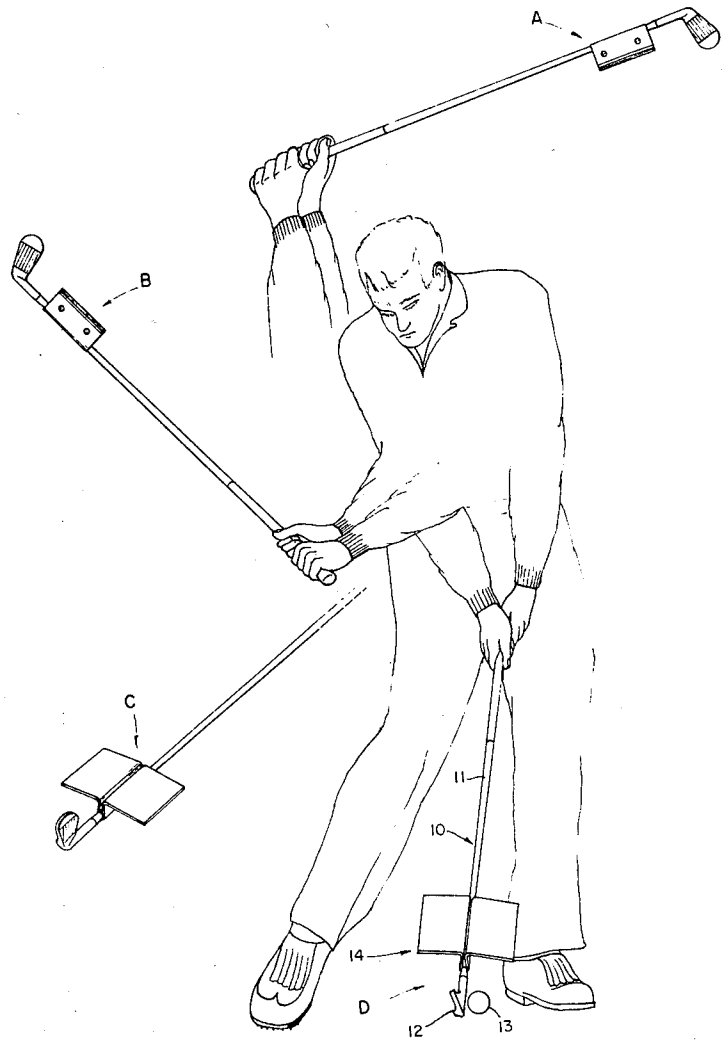
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ABSTRACT: A training device adapted for improving a golfer's swing comprises a wing-shaped member attached to the shaft of a golf club adjacent to the head thereof. The member has substantial air drag inducing surface areas formed thereon with a preselected maximum aspect ratio for initially impeding club head speed and for gradually permitting such speed to increase when the club head enters the hitting zone.

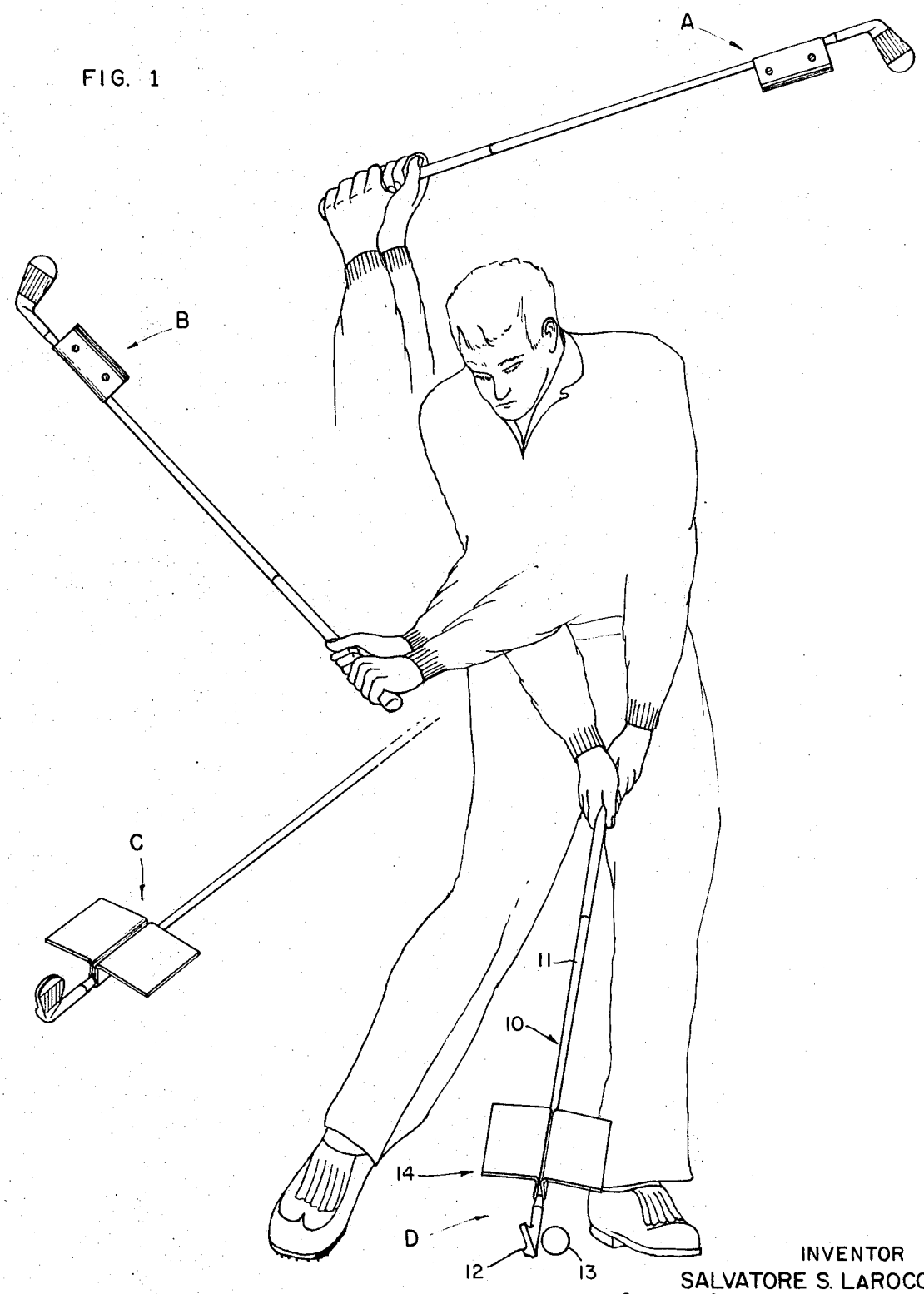


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FIG. 1



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FIG. 2

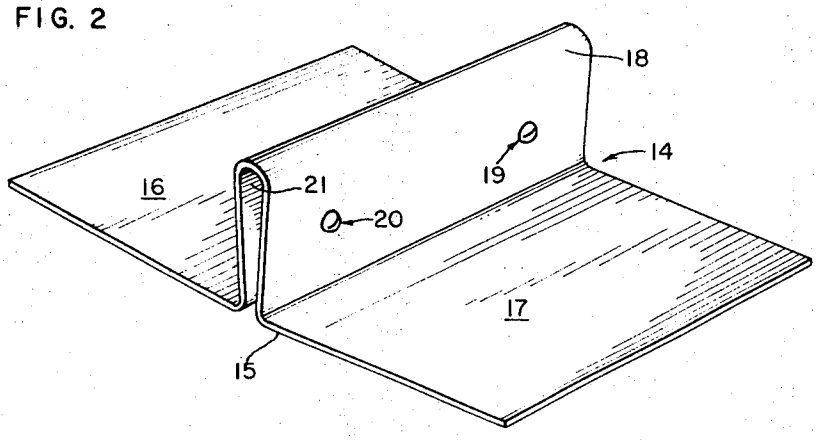
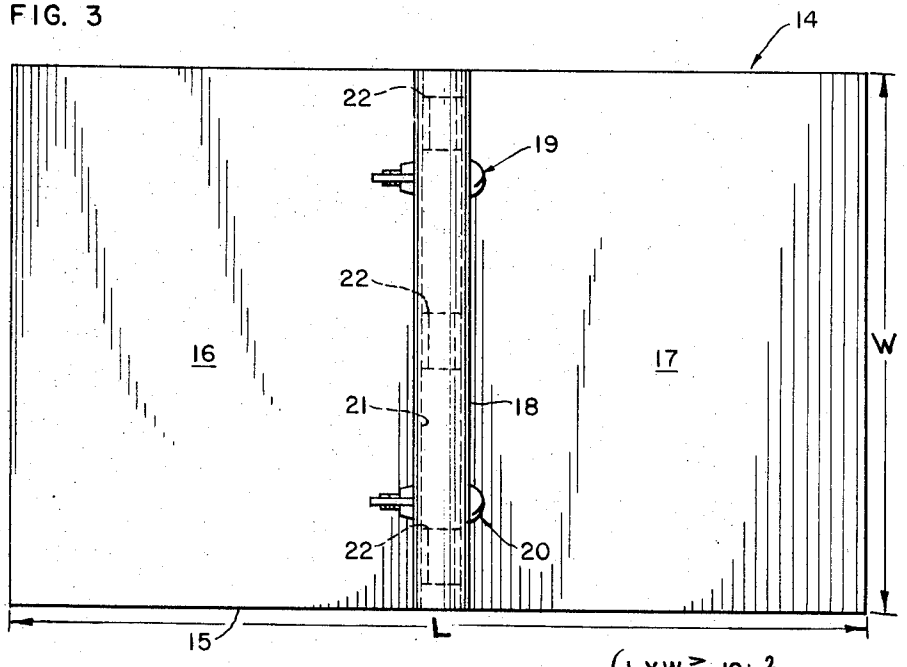
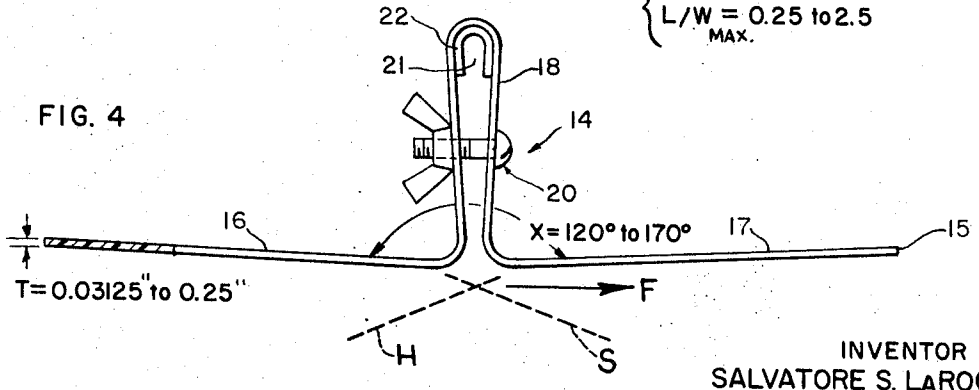


FIG. 3



$\begin{cases} L \times W \geq 12\ in.^2 \\ L/W = 0.25 \text{ to } 2.5 \text{ MAX.} \end{cases}$

FIG. 4



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TRAINING DEVICE FOR IMPROVING GOLFER'S SWING

Numerous training devices have been proposed for improving a golfer's swing. Conventional training devices include various visual and manual aids which attempt to aid the golfer in "grooving" his swing by inducing correct body, leg, arm and hand movements. Few such training devices have proved acceptable to the golfing profession or by golfers at large.

An object of this invention is to provide a noncomplex, inexpensive and effective training device for improving a golfer's swing. Such device comprises a member, adapted to be attached to a golf club, having substantial air drag inducing surface area means formed thereon with a variable effective aspect ratio for creating and encountering progressively less turbulent air resistance during the golfer's downswing.

The device is preferably attached to the lower end of a club's shaft to position such surface area means in substantial alignment with the intended line of golf ball flight. During the initial stages of a golfer's downswing such surface area means function to impede club head speed. Such speed automatically and gradually increases, due to the natural reduction of the effective aspect ratio and angle of attack, to a maximum velocity when the club head enters the hitting zone. In addition, selective orientation of the member on the club's shaft will induce the golfer to "hook" or "fade" depending on the direction of orientation relative to the intended line of flight.

Further objects of this invention will become apparent from the following description and accompanying drawings wherein:

FIG. **1** is a front elevational view of a golfer swinging a club having a preferred training device embodiment of this invention attached thereto;

FIG. **2** is an isometric view of the training device;

FIG. **3** is a top plan view of the training device; and

FIG. **4** is an end elevational view of the training device.

FIG. **1** illustrates sequential stages or zones A, B, C and D of a golfer's downswing. A conventional club **10** comprises a shaft **11** having a head **12** attached thereto and adapted to hit a golf ball **13** at impact zone D. A training device **14** is attached at the lower end of the shaft adjacent to the head primarily for impeding club head speed during club descent through zones A and B and for gradually permitting such speed to increase through zone C to a maximum velocity in impact zone D.

Referring to FIGS. **2—4**, the training device embodiment illustrated comprises a one-piece wing-shaped member **15** having spaced wings **16** and **17** secured to an intermediate and elongated U-shaped channel portion **18**. The wings form substantial air drag inducing surface area means thereon, preferably jointly having an area of at least 12 square inches, extending transversely from each side of the channel portion. Fastening means **19** and **20** may comprise the bolt and wingnut arrangements illustrated for firmly securing the device to shaft **11** of the club. Channel portion **18** forms a U-shaped chamber **21** therethrough adapted to substantially circumvent and house a portion of the club's shaft therein.

Rubberlike gaskets or cushioning pads **22** may be positioned in such chamber to substantially circumvent the shaft to prevent a marring thereof when the device is attached thereto. Member **15** may comprise a plastic or light metal construction with at least the wings thereof having a substantially constant thickness T throughout selected from a range of from 1/32 to ¼ of an inch. The member is preferably sufficiently resilient to afford a pinching action at the channel portion to positively attach the device to the shaft. The member may be fabricated pursuant to conventional machining, injection molding or other suitable techniques.

Referring to FIG. **3**, the length L to width W maximum aspect ratio of the surface area means (including the small exposed surface area of channel portion **18**) may be selected from a range of from 0.25 to 2.5 and preferably from a range of from 0.75 to 2.0. The maximum aspect ratio illustrated approximates 1.6 whereas the minimum aspect ratio approximates 1.6 whereas the minimum aspect ratio approximates 0,

disregarding the edge of wing **17** and forwardly disposed surface of channel portion **18** (zone D). Referring briefly to FIG. **1**, it should be noted that the exposed surface area means of the wing member at zone D are positioned in substantial alignment to the intended line of golf ball flight. Otherwise stated, such positioning finds the surface area means positioned substantially transversely relative to the longitudinal axis of head **12**.

The effective aspect ratio and angle of attack of the wings gradually lessens as noted by their transition from zone A back to zone D during the downswing. Thus, the appreciable amount of air drag and turbulent resistance which is encountered by the wings when they move through zones A and B is gradually reduced to permit club head to accelerate to a maximum velocity in impact zone D.

The induced drag on the surface area means of the wings may be computed in accordance with the following formula:

$$\text{Drag} = C_D \times \frac{dav^2}{2}$$

wherein

C_D = the experimentally determined coefficient of drag;

d = the density of the air, measured in slugs per cubic foot (a slug is the mass of a body weighing 32.2 pounds at sea level);

a = the exposed area of the surface area means ($L \times W$); and

v = relative air speed expressed in feet per second.

It should be further noted by viewing FIG. **1** and in accordance with well-known aerodynamic principles that the angle of attack, i.e. the changing in orientation of the wings relative to a vertical plane containing the intended line of flight, is proportional to the drag coefficient. For example, at a 0 degree angle of attack, i.e., when the wings are parallel to such plane in zone D, the drag coefficient will approximate 0.4. Such drag coefficient will be substantially higher when the wings are located in zone B, for example.

Thus, by comparing the respective positions of the wings in zones B and D it can be seen that club head speed in zone B will be substantially less than when the club enters zone D. The effective aspect ratio of the wings and thus the coefficient of drag thereon gradually decrease when the club moves from zone B to zone D to accelerate the club head to a maximum velocity in zone D. The maximum aspect ratio and drag coefficient will occur when the angle of attack is 180° in the vicinity of zones A and B.

The above briefly discussed aerodynamic desiderata, inherently designed into training device of this invention, aids the golfer in "grooving" his swing for maximum accuracy and distance. For example, it should be noted that the variable air resistance encountered by the club more readily permits the golfer's hips to turn "out of the way" in the desired manner. Also, the golfer's backswing is automatically slowed down and he is encouraged to maintain his wrists in a cocked position prior to the time they return to impact zone D.

It is well known by the golfing profession that such delayed wrist action greatly increases the accuracy and distance afforded to a golf shot. In addition, the other connected parts of the golfer's body tend to move in a unified and correct manner. It should be further noted that selective rotation of the member on shaft will induce the golfer to hook or fade his shot. In particular, orientation of the wings to the dotted line positions H and S in FIG. **4** will induce a hook and fade, respectively, relative to the intended line of flight F.

Although member **15** has been described as comprising substantially flat wings **16** and **17** it should be understood that various modifications may be made thereto without departing from the spirit of this invention. For example, it may prove desirable for certain applications to bend at least one of the wings **16** and **17** out of a flat plane to form an included obtuse angle X therebetween. Such angle, preferably selected from a range of from 120° to 170°, will function to provide a semicup-shaped configuration for effecting increased air turbulence during the downswing.

I claim:

1. A golf training device including an attachment to a golf club to improve a golfer's swing comprising:

a one-piece member having two wing portions extending away from each other in opposite directions, substantial air drag inducing surface area means formed on said two wing portions and positioned with respect to said golf club so as to have a variable effective aspect ratio for creating and encountering turbulent air resistance for impeding club head speed during a golfer's downswing and for permitting such speed to gradually increase to a maximum velocity when a club head enters a hitting zone, and fastening means positioned between and connected to said wing portions for attaching said wing portions directly to the shaft of a golf club for selectively orientating said wing portions on said shaft for inducing a hook or fade when a ball is hit.

2. The invention of claim 1 wherein said surface area means comprises an area of at least 12 square inches.

3. The invention of claim 1 wherein the maximum aspect ratio of said surface area means is selected from a range of from 0.25 to 2.5.

4. The invention of claim 1 wherein the maximum aspect ratio of said surface area means is selected from a range of from 0.75 to 2.0.

5. The invention of claim 1 wherein said fastening means comprises an elongated U-shaped channel portion adapted to substantially circumvent and house a portion of a club's shaft therein and a wing portion extending transversely from each side of said channel portion, said surface area means substantially formed on said wing portions.

6. The invention of claim 5 further comprising U-shaped cushioning pad means disposed in said channel portion and adapted to substantially circumvent a portion of a club's shaft when said wing portions are attached thereto.

7. The invention of claim 5 wherein said wing portions have substantially constant thicknesses throughout selected from a range of from 1/32 to ¼ of an inch.

8. The invention of claim 5 wherein said channel portion is vertically disposed and each said wing portions is flat.

9. The invention of claim 8 wherein each of said wing portions is disposed at an included angle relative to each other selected from a range of from 120° to 170°.

10. The invention of claim 1 wherein said member constitutes a thin plastic material.

11. The invention of claim 1 wherein said wing portions are attached to said shaft adjacent to said head.

12. The invention of claim 11 wherein said surface area means is positioned substantially transversely relative to a longitudinal axis of said head whereby said surface area means is aligned with an intended line of golf ball flight when said wing portions are normally positioned in an impact zone of a golfer's swing.