

(12) PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 200148568 B2**
(10) Patent No. **782850**

(54) Title
Golf training apparatus

(51)⁶ International Patent Classification(s)
A63B 069/36

(21) Application No: 200148568 (22) Application Date: 2001.04.17

(87) WIPO No: W001/78849

(30) Priority Data

(31) Number	(32) Date	(33) Country
0009499	2000.04.17	GB

(43) Publication Date : 2001.10.30

(43) Publication Journal Date : 2002.01.17

(44) Accepted Journal Date : 2005.09.01

(71) Applicant(s)
Explanar (Holdings) Limited

(72) Inventor(s)
Luther Blacklock

(74) Agent/Attorney
SPRUSON and FERGUSON,GPO Box 3898,SYDNEY NSW 2001

(56) Related Art
WO 1985/002780
WO 1983/002728
US 4583740

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 October 2001 (25.10.2001)

PCT

(10) International Publication Number
WO 01/78849 A1

(51) International Patent Classification⁷: A63B 69/36

(21) International Application Number: PCT/GB01/01713

(22) International Filing Date: 17 April 2001 (17.04.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0009499.5 17 April 2000 (17.04.2000) GB

(71) ~~EXPLANAR (HOLDINGS) LIMITED~~

(72) Inventor: BLACKLOCK, Luther [GB/GB]; 1 Duck Lane, Woburn, Beds MK17 9PT (GB).

(74) Agents: LECKEY, David, H. et al.; Frank B. Dehn & Co., 179 Queen Victoria Street, London EC4V 4EL (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, BZ, CA,

(71) c/- Reynolds Porter Chamberlain, Chichester House, 278/282 High Holborn, London WC1V 7HA (GB).

CH, CN, CO, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

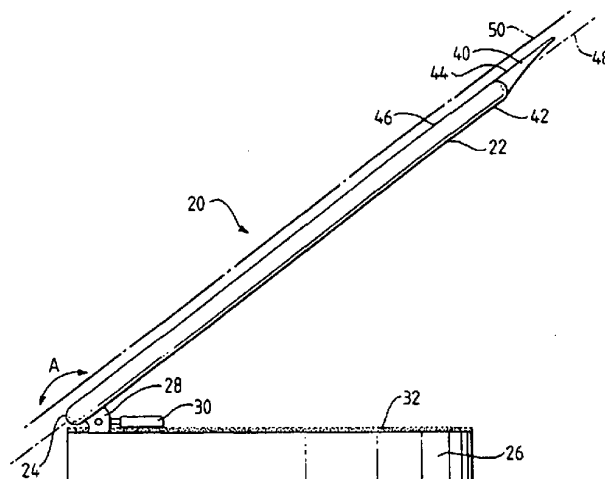
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: GOLF TRAINING APPARATUS



(57) Abstract: A golf training aid (20) comprises a circular hoop (22) that is inclined or inclinable in use at an angle to the horizontal. A planar surface (44) is defined extending outwardly from the surface of the upper end (42) of the hoop and parallel to the plane of the hoop (22). The golf training aid (20) can be used in combination with a club and can assist a golfer in developing an improved swing.



WO 01/78849 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

GOLF TRAINING APPARATUS

5 The present invention relates to golf training
apparatus and more particularly to apparatus which can
assist a golfer in developing an improved swing.

10 The swing is undoubtedly one of, if not the, most
important component of a golfer's game. It is a complex
composite movement of a golfer's hands, wrists, arms and
body and if not properly executed can lead to a ball
being mishit.

15 Most golfers practice their swing in an empirical
manner, for example by hitting practice balls on a
driving range. Developing a swing in this manner is
rather unsatisfactory since the golfer will not
necessarily know why he or she has mishit a ball and so
be able to correct the fault. Also, there is no easy
way in which, having hit a ball successfully, the golfer
can reliably repeat that shot.

20 One training aid has been proposed which takes the
form of an inclined hoop inside which a golfer stands.
The golfer rests his or her club on the hoop and then
swings the club in contact with the hoop. As the club
is swung, it is constrained to move in a given plane by
25 the hoop, at least at its point of contact with the
hoop. This may go some way to improving the swing in
that it allows the golfer easily to reproduce a given
swing, but it does not provide a fully satisfactory
training aid in that it fails to address a particularly
30 important area of the swing, namely the top of the
backswing.

35 The Applicant has recognised that the optimum swing
is achieved when the swing occurs in an optimum swing
plane. This plane is a plane which extends generally
through the upper sternum of the golfer to the ball at
the point of striking the ball. In particular, the
Applicant has recognised that the ball, the golfer's
upper sternum, the butt of the club and the "sweet spot"
of the club head (that part of the club head which will

- 2 -

make optimum contact with the ball) should all lie in the optimum plane at the top of the backswing and also in the follow through. Whilst the above described hoop apparatus may to some extent assist a golfer in developing a swing, it does not constrain the swing at the top of the backswing or in the follow through since the shaft of the club may rotate around the contact surface of the hoop such that the head and butt of the club may lie out of the optimum swing plane.

The present invention seeks to overcome this problem and from a first aspect the invention provides a golf training aid comprising a circular hoop inclined or inclinable in use at an angle to the horizontal, and means defining a planar surface extending outwardly from the surface of the upper end of the hoop in a direction parallel to the plane of the hoop.

In accordance with the invention therefore, a planar surface is defined around the upper end of the hoop in a direction parallel to the plane of the hoop.

The planar surface acts to guide the club along the optimum swing plane more accurately than in existing apparatus, preventing unwanted rotation of the club around the hoop at the top part of the backswing. From a further broad aspect, therefore the invention provides a golf training aid comprising a hoop inclined or inclinable in use at an angle to the horizontal and over whose surface a club may be swung, said hoop comprising means which guides the club to move in a given plane at the top of the swing.

The planar surface extends only over a limited circumferential extent of the hoop. This is because the surface is actually only needed at the top of the hoop, since certain excursions of the club from the optimum swing plane can be tolerated in the lower parts of the swing. Indeed this is desirable in that it allows a golfer to develop a more natural swing.

Typically, therefore, the planar surface extends

- 3 -

for only up to about 120° or less, more preferably about 90°, around the top of the hoop. Preferably the surface is arranged symmetrically with respect to the vertical centre-line of the hoop.

5 The hoop is preferably arcuate, most preferably circular in cross section, with the planar surface extending tangentially from the contact surface of the hoop in a direction parallel to the plane of the hoop. The hoop need not be circular in section, but preferably
10 it has an arcuate surface for engaging the club. The contact surface could, for example, be a semi-circular surface.

 The planar surface need extend outwardly from the hoop only so far as is needed to provide sufficient
15 guidance for the club. This may be determined empirically, but in the case of a 6 ft (1.8 m) diameter hoop the planar surface may typically extend for a maximum distance of about 18" (0.5 m). The planar surface should not, however, extend so far that if it is
20 being used with conventional clubs it interferes with the head of the club, thereby moving the club head out of plane.

 Preferably the radial depth of the planar surface increases from the edges thereof. In the preferred
25 embodiment, the depth is zero at the edges of the surface, which enables a smooth movement of the club onto the surface. Most preferably the depth increases to a maximum on the centre-line of the hoop, and the surface is symmetrical therearound.

30 In the most preferred embodiment, the outer edge of the surface is curved so that the surface resembles a crescent.

 The planar surface may, for example, be defined between co-planar radially inner and outer surfaces,
35 constituted for example by the hoop and a rail extending around the top of the hoop. A potential disadvantage of this arrangement is that a club may fall down between

- 4 -

the defining surfaces, so preferably the planar surface is substantially solid. The surface may, therefore, be formed as an integral part of the hoop, e.g. it may be integrally moulded with a plastics hoop, or it may be
5 formed on a separate component which is affixed to the hoop either permanently or removable by suitable fixing means, e.g. by welding.

As stated above, in use the hoop is inclined to the horizontal. Preferably the inclination of the hoop is
10 variable so as to permit the optimum swing plane to be set for every user. The variation in inclination may be achieved in any suitable manner. For example opposed sides of the hoop may be mounted on respective supports, so as to be pivotable around the horizontal centre-line
15 of the hoop. Preferably, however, the hoop is pivotably mounted at its lower end so that the lower end of the hoop remains in a generally fixed position relative to the ground.

The inclination of the hoop may be achieved
20 manually, for example by loosening appropriate fixing means and rotating the hoop by hand. In an alternative arrangement, however, the inclination can be varied pneumatically or hydraulically by a suitable piston arrangement. In a simple embodiment, a hydraulic
25 mechanism may be foot operated.

The hoop may be mounted on a base having a suitable standing surface for a user, for example one covered in
30 astroturf, to simulate a golf tee. The base may also act to accommodate any power mechanism for inclining the hoop.

Ideally, the inclination of the hoop should be set for each individual, for example by a coach who can stand to one side of the hoop and align the hoop in the optimum swing plane for the user. However, this plane
35 will vary from user to user, and it may not always be possible to set the inclination to an individual's precise requirements. In such a case, the hoop may for

- 5 -

example be provided with a plurality of predetermined inclination settings and the particular inclination for a particular user based, for example, on height and arm length, be determined empirically and suitably displayed with the apparatus, so that the inclination can then be set to the empirically determined value by the user.

The apparatus described so far may be used with a simple golf club, for example. However, this is not preferred as it may cause damage to the club as it slides over the hoop surface. To alleviate this problem the hoop and/or the club may be provided with a low friction coating such as PTFE. The club could also be provided with a low friction sleeve e.g. of plastics such as PTFE, which fits over the club shaft.

Preferably, however, a custom practice club is used with the apparatus to avoid damage to a playing club. The practice club could, for example, comprise just a shaft having a grip and with a friction reducing sleeve arranged around it. In broad terms, therefore, the invention also provides a club for use in swinging over an inclined hoop comprising means provided on the shaft of the club for reducing friction with the hoop.

Preferably, however, a sleeve is rotatably mounted on the club shaft whereby as the club is moved over the hoop the sleeve can rotate about the shaft, thereby allowing the club to roll, rather than slide, over the hoop. This acts greatly to reduce friction with the hoop in use, and produces a much more satisfactory swing. This is in itself a novel arrangement, and from a further aspect the invention provides a golf training club comprising a shaft with a grip at one end and a sleeve rotatably mounted about the shaft.

Preferably rolling bearings such as ball bearings or roller bearings may be provided at appropriate locations between the shaft and the sleeve. In a simple embodiment, a bearing may be provided at each end of the sleeve, although additional bearings may be provided at

- 6 -

intermediate locations along the sleeve, if required.

The sleeve preferably has a surface which promotes rolling of the sleeve on the hoop, for example a surface made of a resilient material such as rubber. The sleeve
5 could be made entirely of that material, but preferably it comprises a metallic, e.g. a steel tube provided with an appropriate facing. The use of a metallic substrate is advantageous in that it lends rigidity to the sleeve, and also adds weight to the club. This is important in
10 that it means that the club can be made significantly heavier than a normal club. This is potentially advantageous in that apart from acting to improve the golfer's swing it can act to exercise the golfer. In particular, the apparatus of the invention can provide a
15 cardio-vascular work out for a user as well as building "golfing" muscle in the appropriate body locations and promoting muscular flexibility.

A training club for use in apparatus in accordance with the invention may also be provided with means which
20 limits the rotation of the forearms and causes the wrists to hinge in the optimum plane at the top of the backswing, and the follow through. This is advantageous in that it promotes an optimum blend of hand, wrist, forearm and body movements.

Preferably the limiting means comprises a planar surface provided on the club which will engage with the planar surface extending from the hoop at the top of the backswing and preferably also on the follow through. Most preferably, therefore, the club comprises two
25 limiting surfaces, one for the backswing and one for the follow through. This is in itself a novel arrangement so from a further aspect the invention provides a golf practice club comprising a shaft having a grip at one end, having at least one and preferably two axially
30 extending planar surfaces mounted to or provided on a portion of the length of the shaft.
35

These surface may advantageously be provided on a

- 7 -

fin formed integrally with, or mounted to, the club shaft in such a way that it does not rotate relative to the shaft. The fin could, for example, be moulded onto the shaft.

5 Preferably, the planar surfaces on the club are arranged parallel to each other, and they may be joined at their leading edges by an circularly arcuate section which normally engages the hoop.

10 The fin may be made from or coated with a low friction material, but the 'finned' club arrangement is preferably combined with the rolling sleeve arrangement discussed above. Thus in a particularly preferred arrangement, the fin is mounted to a fixed shaft of the club around which is mounted a rolling sleeve.

15 It will be appreciated that the invention also extends to a combination of the hoop apparatus and training clubs as described above.

20 Some preferred embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which:

Figure 1 shows a golfer addressing a golf ball;

25 Figure 2 shows a golfer at the top of the backswing;

Figure 3 shows a perspective view of apparatus embodying the invention;

30 Figure 4 shows a side elevation of the apparatus of Figure 3;

Figure 5 shows a training club for use with the apparatus shown in Figures 3 and 4;

35 Figure 6 shows a sectional view on line 6-6 of Figure 5;

Figure 7 shows a second embodiment of a training club

- 8 -

for use with the apparatus of Figures 3 and 4;

Figure 8 is a section along line 8-8 of Figure 7;

5 Figure 9 shows a third embodiment of a training club for use with the apparatus of Figures 3 and 4;

Figure 10 is an end view of the training club of Figure 9;

10

Figures 11A-11G show different phases of a swing using apparatus of the invention, viewed from face on; and

15 Figures 12A-12G show the same phases of a swing, viewed from the side.

With reference to Figures 1 and 2, Figure 1 shows a golfer 2 addressing a ball 4. When addressing the ball correctly, the golfer's feet 6 should be aimed parallel to the target line (the line extending between the ball 4 and the target). It will be seen that a plane 8 extends through the target line, through the ball 4 and through the golfer's upper sternum 10. The Applicant believes that this is the optimum swing plane for a golfer. The Applicant believes that the sternum 10 of the golfer, the butt 12 of the golf club 13 and the sweet spot 14 of the club head should all lie in the plane 8 when, as shown in Figure 2, the golfer is at the top of the backswing and ideally also, at follow through.

30

An apparatus embodying the invention which helps achieve the above objective is shown in Figures 3 and 4. The apparatus 20 comprises a hoop 22 which is pivotally mounted at its lower end 24 to a base 26 the hoop 22 is circular in shape and may typically have a diameter of 6 feet (1.83 metres). In this embodiment, the hoop 22 is made of steel tube of 3" (75 mm) diameter. However,

35

- 9 -

the hoop may be made of other materials and may not necessarily be hollow. For example, a lightweight hoop could be made from plastics or other similar material.

5 The hoop 22 is provided with a bracket 28 at its lower end 24. The bracket 28 is attached to hydraulic means (not shown) within the base 26 which are operable by a foot lever 30 whereby the bracket may be pivoted in the directions indicated by arrow A on Figure 4 so as to vary the inclination of the hoop 22 from the horizontal.
10 The base 26 may be provided with a surface 32 of astroturf or the like for simulating a grass surface.

Attached to the upper end of the hoop 22 is a fin 40. The fin 40 is, in this embodiment, a separate component which is suitably attached e.g. by welding, to
15 the hoop 22 around the upper end 42 of the hoop. As can be seen from Figure 3, the fin 40 is generally crescent shaped and it extends symmetrically for approximately 120° around the upper end of the hoop 22.

As can be seen most clearly from Figure 4, the fin
20 40 has an upper planar surface 44 which lies flush with the uppermost surface 46 of the hoop 22 and which extends parallel to the axis 48 of the hoop 22. Thus the planar surface 44 effectively constitutes a planar extension of the upper surface 46 of the hoop around the
25 upper end 42 of the hoop.

As will be described in greater detail below, in use, a golfer will stand inside the hoop 22 and rest a club on the surface 46 of the hoop 22 and then swing the club in contact with that surface 46. This constrains
30 the club shaft to follow the surface 46 of the ring 22. Furthermore, when the club 13 is at the top of the backswing or at the follow through, then the club will also engage the planar surface 44 of the fin 40 such that the butt of the club, the sweet spot and the
35 sternum lie in a plane 50 defined parallel to the plane of the hoop 22. In this way, the club is maintained in the swing plane at these crucial parts of the swing.

- 10 -

This constraint is not required at other parts of the swing since each individual has a particular swing style which means that it is in fact desirable to allow variation in the angle of the club shaft relative to the surface 46 as the club descends from the top of the backswing towards the striking point.

Whilst it may be possible to use a conventional club with the apparatus described above, it is, however, preferred to use a customised training club. A first embodiment of such a club is shown in Figure 5.

This club 60 comprises a shaft 62 having a grip 64 provided on its proximal end and a rubber sleeve 66 provided extending over the major part of its length towards its distal end. The sleeve 66 is rotatably mounted on the shaft 62 by bearings (not shown) at its respective ends 68, 70 whereby the sleeve may effectively roll over the shaft surface. As shown the sleeve is of solid rubber, but it may, in fact, comprise a metal, e.g. steel, sleeve 72 (shown in dotted lines in Figure 6) having a rubber coating. The advantage of this arrangement is that it adds rigidity to the club, provides improved support for the bearings and it adds weight to the training club 60.

By virtue of the rubber surface of the training club and its bearing mounting, it will be appreciated that when the club 60 is placed in contact with the surface 46 of the hoop 22, and swung around the hoop 22 it will roll over the hoop surface 46 rather than slide. This will produce a much smoother action and will also reduce the possibility of damage to the ring surface 46.

The practice club 60 is preferably heavier than a standard club so that the user of the apparatus will be effectively exercising whilst using the apparatus which will not only give cardio-vascular benefits but also help to build and improve muscle in the appropriate areas for the swing.

A second embodiment of club suitable for use with

- 11 -

the invention is shown in Figure 7 and 8. In this embodiment, a club 80 comprises a shaft 82 on whose distal end 84 is provided a grip 86. A generally tear-drop shaped sleeve 90 extends over the distal end 92 of the shaft 82. The sleeve 90 may be a separate component, suitably attached to the shaft 82 or, for example be integrally formed with the shaft, for example by insert moulding with the shaft 82.

The sleeve 90 is, therefore, preferably of plastics and, most preferably of a low friction plastic such as PTFE so as to reduce friction with the ring 22 in use. As can be seen best from Figure 8, the sleeve 90 comprises two planar surfaces 94 and 96 which are parallel to each other and extend tangentially rearwardly from the semi-circular section nose 98 of the sleeve 90. Upon addressing the ball the trailing edge 99 of the sleeve 90 should be pointing away from the golfer's body. The advantage of the planar surfaces 94, 96 is that in use, when the golfer approaches the top of the backswing the surface 94 will come into contact with the planar surface 44 on the fin 40. This will give an audible indication that the club 80 is in the upper most part of the backswing. Furthermore, it will also prevent the further rotation of the club shaft relative to the fin 40 so as to maintain the user's forearms in the correct position for optimum swing.

After the stroke has taken place and the follow through occurs then the opposite surface 96 of the sleeve 90 will come into contact with the fin 40 again preventing over-rotation of the golfer's forearms.

A third embodiment of training club for use with the apparatus Figures 3 and 4 is disclosed in Figures 9 and 10. In fact, the club 100 of this embodiment is a hybrid of the clubs of Figures 5 to 8. In particular, the club 100 comprises a shaft 102 having a grip 104 provided at its proximal end. A fin 106 having parallel planar surfaces 108 and 110 is fixedly attached to the

- 12 -

shaft 102 at its respective ends 112, 114. Accordingly, there can be no relative movement between the shaft 102 and the fin 106. However, a rolling sleeve 116 is also mounted on the shaft 102, in a manner similar to that in the embodiment of Figures 5 and 6. Thus the sleeve 116 may rotate on the shaft 102 so that in use, the club can roll over the hoop surface 46 and at the same time the fin surfaces 108, 110 still come into contact with the fin surface 44 at the top of the backswing and in the follow through.

The execution of a swing using apparatus in accordance with the invention will now be explained with reference to Figures 11 and 12 which show different phases in a swing being made using apparatus in accordance with the invention.

In Figures 11A and 12A, the golfer 120 using a roller club 60 as shown in Figures 5 and 6 takes stance in the middle of the hoop 22 with the roller 66 of the club 60 resting on the hoop 22. The golfer's feet are aligned parallel to the target line.

Figures 11B and 12B show a golfer half way through the backswing. In moving from the position shown in Figures 11A and 12A to that shown in Figures 11B and 12B, the roller 66 of the club 60 rolls over the surface 46 of the hoop 22. As can be seen, the golfer has turned his shoulders and upper body to initiate the swing.

In Figures 11C and 12C, the golfer is approaching the top of the backswing. The golfer's forearms are obliged to roll as the shoulder and body turn continues and as shown in Figure 12C, the golfer's weight is transferred to the right foot. The roller 66 has also now moved onto the planar surface 44.

In Figures 11D and 12D, the golfer has now reached the top of the backswing. In this position the golfer's wrists are hinged through 90° from their rest position and the roller 66 of the club 60 is now lying flat on

- 13 -

the planar surface 44 of the fin 40. At this position the golfer's sternum, the butt of the club and the distal end of the club are all lying in a plane which lies parallel to the surface of the hoop 22. This
5 corresponds to the optimal swing plane. The planar surface 44 of the fin 40 ensures that hinging of the golfer's wrist occurs in the optimal plane during this part of the swing.

10 In Figures 11E and 12E, the golfer has commenced the downswing and his body weight shifts to his left leg. The roller has moved along the fin 40 and rejoins the hoop surface 46.

Figures 11F and 12F, show the impact position. As can be seen, although the sweetspot of the club and the golfer's upper sternum lie in the optimal plane, the
15 whole club does not, and the butt of the club lies below the plane. This is not of particular importance, and the actual position of the butt of the club will depend upon the individual golfer's swing. The momentum of the rolling club will carry the player on through the impact
20 position.

Figures 11G and 12G show a follow through position in which the player's weight has moved even more onto the left foot, the hands and forearms roll over each
25 other and a wide arch is encouraged by the clubs rolling momentum. The roller 66 of the club 60 still maintains contact with the surface 46 of the hoop 22.

Finally, Figures 11H and 12H show the end of the swing, with the golfer in a full follow through
30 position. It is in some respects a mirror of the position shown in Figures 11D and 12D. In this position, the roller 66 of the club 60 again lies flat on the fin 40 such that the club head, butt and the golfer's upper body lie in the optimal swing plane.

35 In use, the golfer would build a swing slowly from the rest position shown in Figures 11A and 12A to a full swing. In particular, in a warm-up the golfer may only

- 14 -

swing through the bottom half of the hoop 22, slowly building towards a full swing. It will be appreciated that the equipment will not only improve the golfer's swing but would also be a useful form of exercise, particularly when the club 60 being used is weighted so as to be heavier than a normal club.

It will be appreciated that the above described embodiments are given by way of example only and that various modifications thereto may be made without departing from the scope of the invention. For example, the rolling sleeve 66 of the clubs shown in Figures 5 and 9 may be made of any suitable material which will allow a rolling engagement with the ring surface 46. Rubber is given as merely one suitable example and others will be apparent to the skilled person. Furthermore, the fin 44 which is shown as a separate component in Figures 3 and 4 need not necessarily be so and it would be possible, for example, to form this integrally with the hoop 22. Furthermore, the hoop itself can be of some other material than metal, for example plastics and indeed this may be desirable in a low cost application, such as one as may be used at home. Also, the hoop 22 need not be a circular section tube, but could have other sections, for example a D section.

It will also be appreciated that the ring may be supported by means other than those specifically shown, for example by supports at opposed sides thereof. Furthermore, although a hydraulically operated mechanism is disclosed for varying the angle of inclination of the hoop 22, it is anticipated that this could be done, for example manually, in less expensive versions of the apparatus, or even through other means such as electric motors.

It is anticipated that the invention may be applied in several areas. For example, it could very usefully be installed at golf clubs and driving ranges where a

- 15 -

user may practice a swing before playing a game or before hitting some practice balls. However, it is equally anticipated that the equipment could be installed, for example, in health clubs and such like
5 where users may not only take the opportunity to improve their golfing swing but also exercise using the equipment.

It will be clear that the equipment in accordance with the invention can be provided with ancillary
10 equipment such as video camera means which will allow a user to analyse his or her action during use of the equipment, audio visual means to give information to users on how to use the equipment, and setting tables
15 giving information which allows the hoop to be set at the appropriate angle for a user depending on his or her height, arm length and so on.

All such arrangements are intended to fall within the scope of the invention.

- 16 -

Claims

1. A golf training aid comprising a circular hoop inclined or inclinable in use at an angle to the horizontal, and means defining a planar surface extending outwardly for a limited circumferential extent from the surface of the upper end of the hoop in a direction parallel to the plane of the hoop.
2. A golf training aid as claimed in claim 1 wherein the planar surface extends for only up to about 120° around the top of the hoop.
3. A golf training aid as claimed in claim 2 wherein the planar surface extends for about 90° around the top of the hoop.
4. A golf training aid as claimed in claim 1, 2 or 3 wherein the planar surface is arranged symmetrically with respect to the vertical centre-line of the hoop.
5. A golf training aid as claimed in any preceding claim 1 wherein the hoop is at least partially circular in cross section.
6. A golf training aid as claimed in any preceding claim wherein the radial depth of the planar surface increases from the edges thereof.
7. A golf training aid as claimed in claim 6 wherein the depth is zero at the edges of the surface and increases to a maximum around the centre-line of the hoop.
8. A golf training aid as claimed in claim 6 or 7 wherein the planar surface is crescent shaped.

29-04-2002

- 17 -

9. A golf training aid as claimed in any preceding claim wherein the planar surface is defined between coplanar radially inner and outer surfaces.
- 5 10. A golf training aid as claimed in any of claims 1 to 8 wherein the planar surface is solid.
- 10 11. A golf training aid as claimed in claim 10 wherein the planar surface is formed as an integral part of the hoop.
12. A golf training aid as claimed in claim 10 wherein the planar surface is formed on a component which is affixed to the hoop.
- 15 13. A golf training aid as claimed in any preceding claim wherein the inclination of the hoop is variable.
- 20 14. A golf training aid as claimed in claim 13 wherein the hoop is pivotably mounted at its lower end.
- 25 15. A golf training aid as claimed in any preceding claim further comprising a base having a standing surface for a user to which the base the hoop is mounted.
- 30 16. Golf training apparatus comprising a golf training aid as claimed in any preceding claim in combination with a club.
- 35 17. Golf training apparatus as claimed in claim 16 wherein the hoop surface and/or the club is provided with a low friction coating such as PTFE.
18. Golf training apparatus as claimed in claim 17 wherein the club is provided with a low friction sleeve around the shaft thereof.

- 18 -

19. Golf training apparatus as claimed in any of claims 16 to 18 wherein a sleeve is rotatably mounted on the club shaft.
- 5 20. Golf training apparatus as claimed in claim 19 wherein the rolling surface of the club is of a material which promotes rolling of the sleeve on the hoop.
- 10 21. Golf training apparatus as claimed in claims 19 or 20 wherein the sleeve comprises a metallic tube provided with a rolling material facing.
- 15 22. Golf training apparatus as claimed in any of claims 19 to 21 wherein the club comprises at least one and preferably two planar surfaces extending axially along and radially outwardly of the club shaft.
- 20 23. Golf training apparatus as claimed in claim 22 comprising a pair of parallel planar surfaces.
24. Golf training apparatus as claimed in claim 22 wherein said surfaces are provided on a fin formed integrally with, or mounted to, the club shaft.
- 25 25. Golf training apparatus as claimed in claim 24 wherein the fin is mounted to a fixed shaft of the club around which is mounted a rolling sleeve.

26. A golf training apparatus comprising:
a golf training aid as claimed in any one of claims 1 to 15; and
a club for use in swinging over said inclined hoop comprising means provided on
the shaft of the club for reducing friction with the hoop.

5 27. A golf training aid substantially as hereinbefore described with
reference to Figures 3 and 4 of the accompanying drawings.

28. A golf training apparatus substantially as hereinbefore described with
reference to Figures 3 and 4 and either Figures 5 and 6, Figures 7 and 8 or Figures 9 and
10 of the accompanying drawings.

10

Dated 6 July 2005
Explanar (Holdings) Limited
Patent Attorneys for the Applicant/Nominated Person
SPRUSON & FERGUSON

8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1189
1190
1191
1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1798
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1810
1811
1812
1813
1814
1815
1816
1817
1818
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
2174
2175
2176
2177
2178
2179
2180
2181

1/6

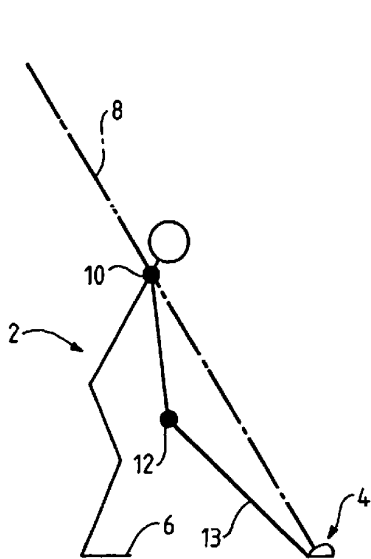


FIG. 1

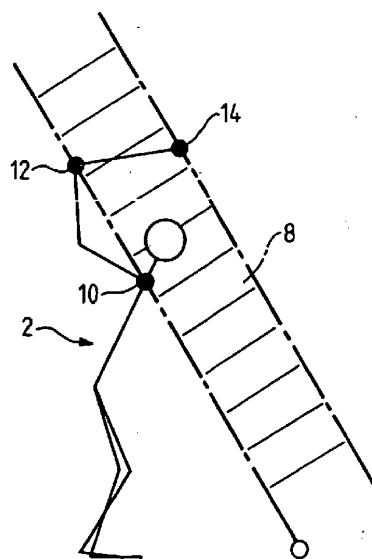


FIG. 2

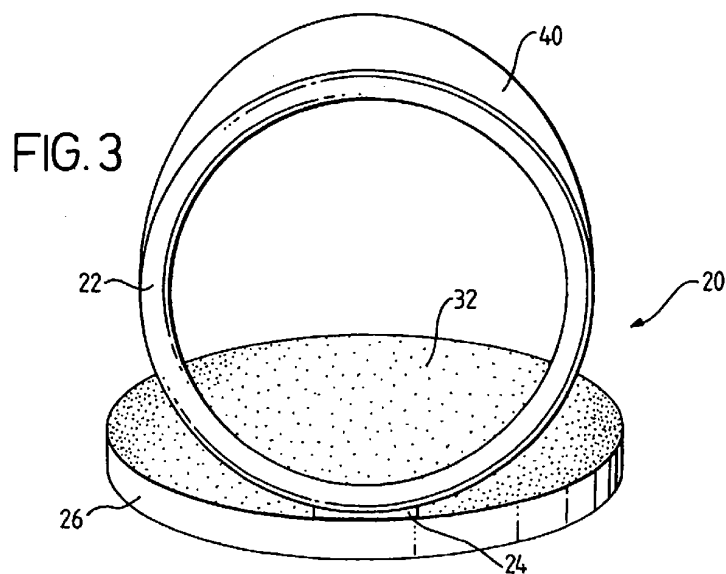
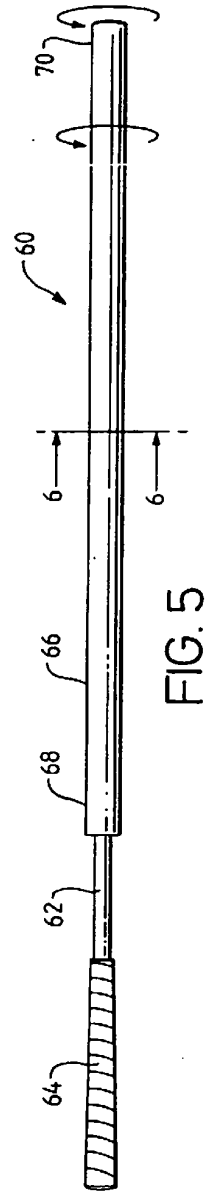
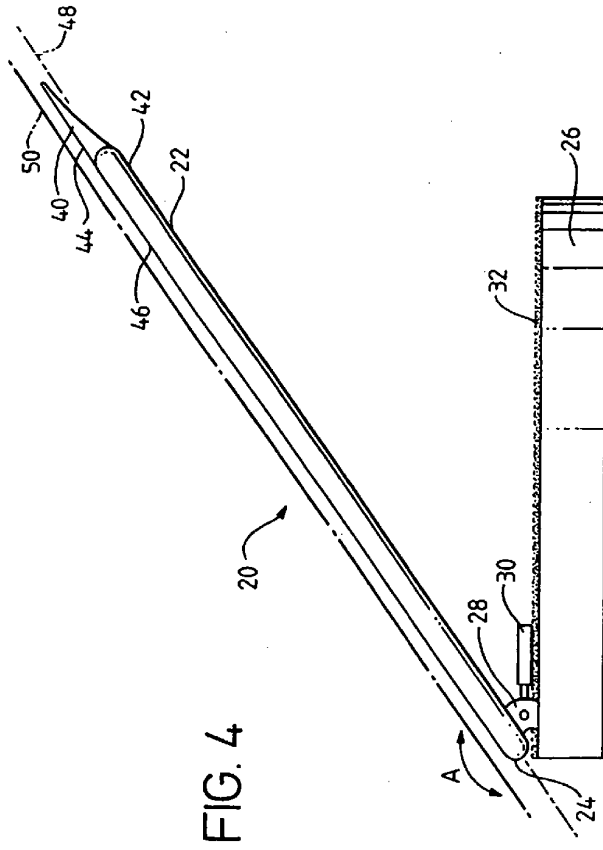
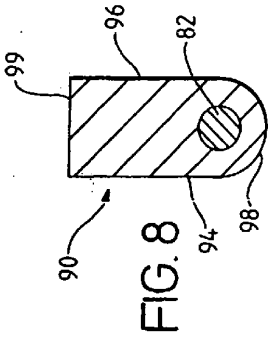
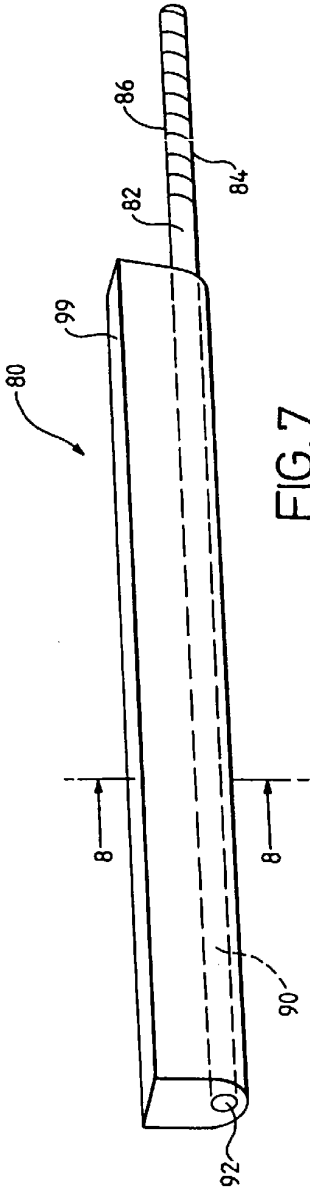
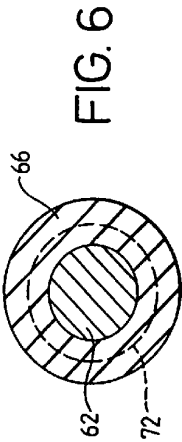


FIG. 3

2/6



3/6



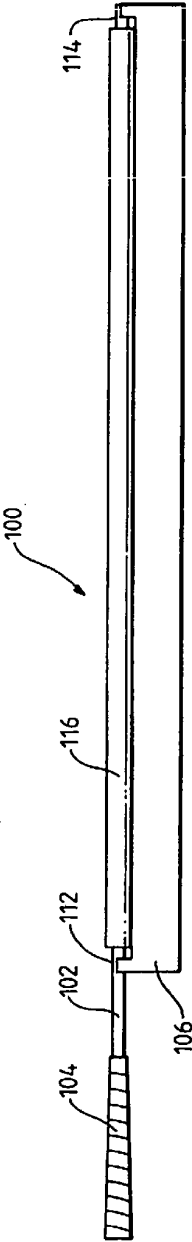


FIG. 9

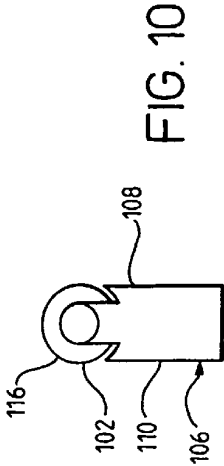
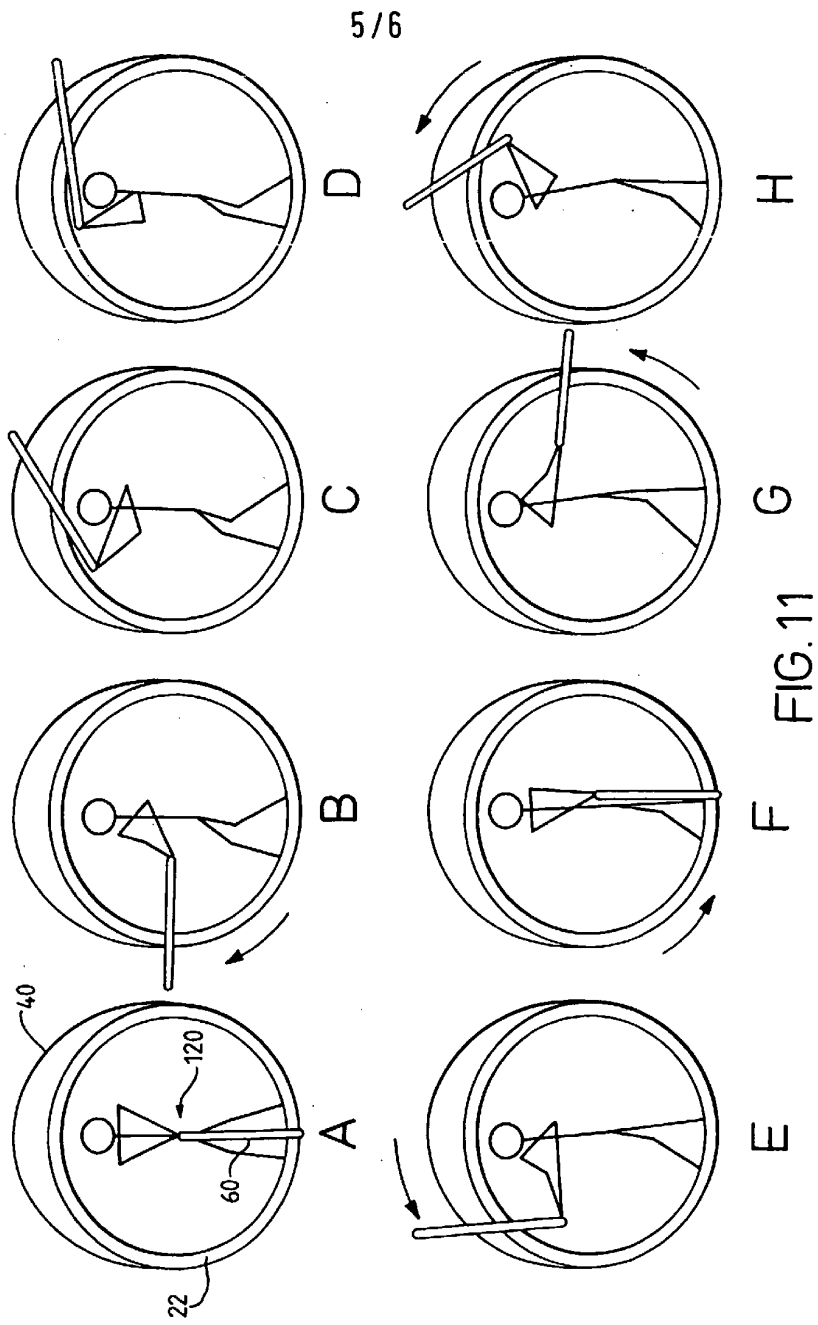


FIG. 10



6/6

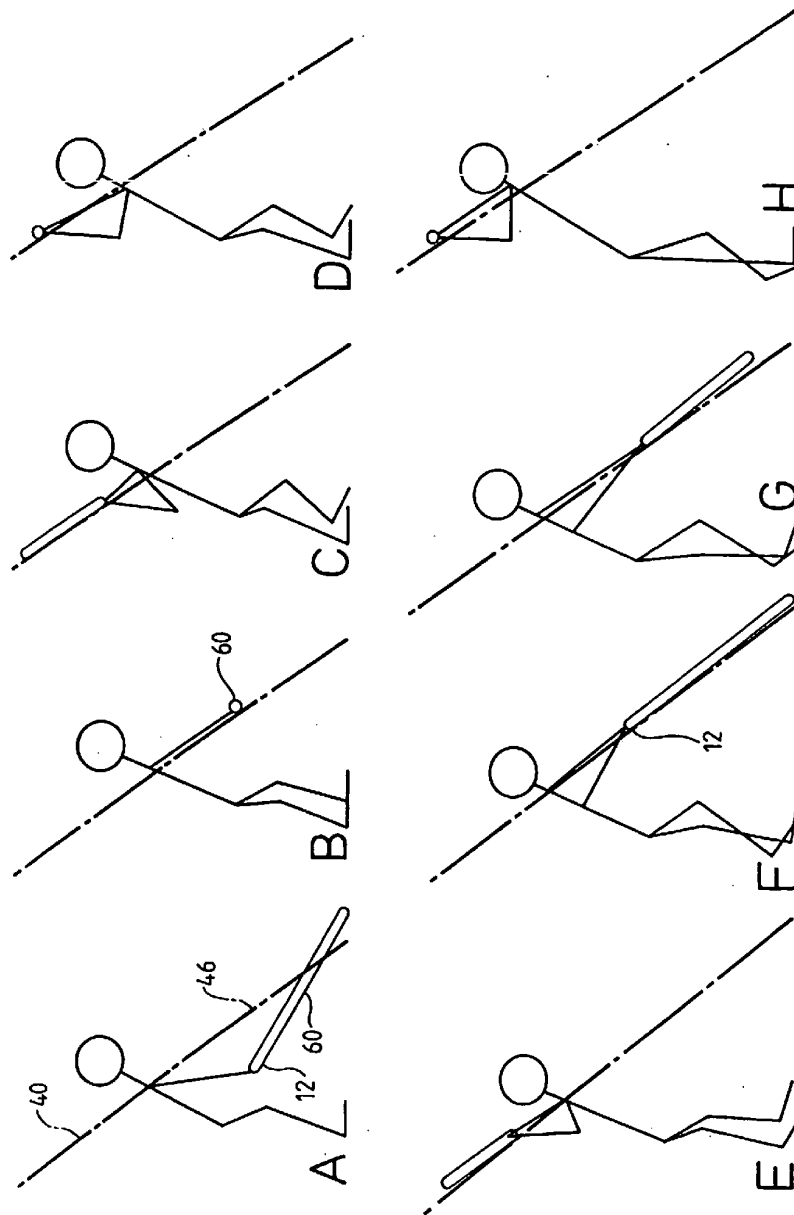


FIG. 12