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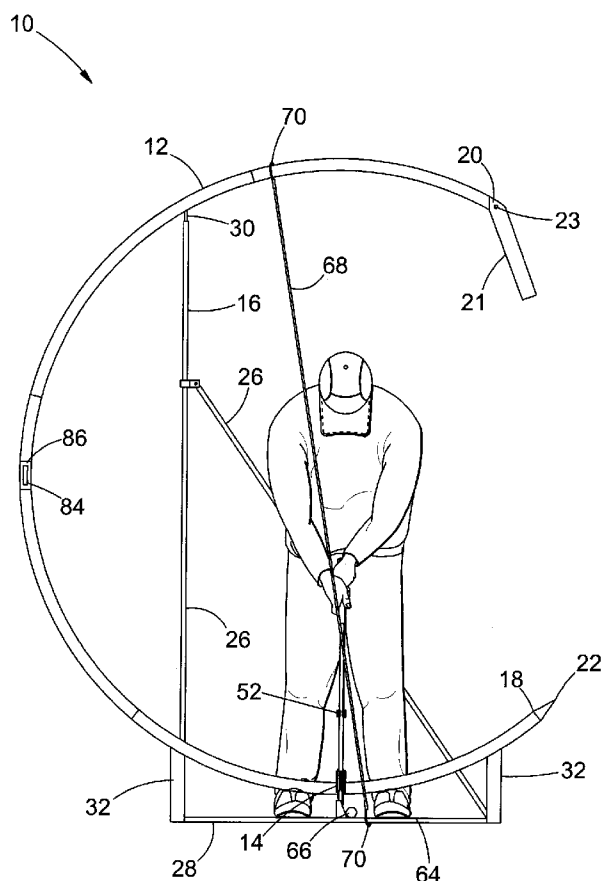


FIGURE 10

(57) Abstract: The invention provides for a golf teaching apparatus including: an elongate arcuate track; a carriage being slidable along the track; wherein the carriage includes receiving means for releasably receiving a shaft of a golf club. The apparatus further includes a mat, golf club displacement limiters, sensors and a golf swing plane determiner. The carriage allows for freedom of movement of a shaft of a golf club relative to the track, and linear movement of the shaft relative to the receiving means.

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GOLF TEACHING APPARATUS

FIELD OF THE INVENTION

5 The invention relates to a golf teaching apparatus, and more particularly to a golf teaching apparatus for use in teaching and training a golfer to adopt a correct golf swing.

BACKGROUND TO THE INVENTION

10

Golf is a popular and highly technical sport, the backbone of which is a proper swing of the club used to hit the ball. A golf swing comprises an intricate composite movement of a player's hands, wrists, arms and body, all of which must be properly sequenced and timed, failing which the contact and thus engagement of the golf ball
15 by a golf club will be adversely affected.

20

In practice, many aspiring golfers are substantially self-taught, and tend to learn the game of golf, and thus the golf swing, independently without any substantial expert advice from a person suitably skilled in the sport. Advice is also often sought from other aspiring or amateur, but not professional, players, which often results in incorrect techniques being adopted, and in bad habits being formed.

25

Also, aspiring golfers are often advised to start off with incorrect golf clubs. This is an incorrect approach as it results in golfers developing a golf swing that is not in harmony with the mechanics and dynamics of the human body.

30

Various training aids have in the past been proposed for use in teaching an aspiring golfer a proper golf swing. However, most of these training aids share the common denominator of being complicated and expensive. Also, these devices often focus on a particular aspect of a golf swing, whilst neglecting other factors and therefore not providing comprehensive training for all facets of the complete golf swing.

35

It has also been found that, in the game of golf, a player hits a stationary golf ball from a surface using a golf club. The surface may be of various types, but is typically in the form of a grass-covered substrate. When practising golf at home or at a driving range, it is advisable that a surface from which a ball is hit closely resembles the actual conditions that one would find on a golf course.

In the past a number of synthetic golf mats have been proposed for use in simulating a grass surface found on a golf course. However, these mats generally share the common denominator of not closely resembling the actual playing conditions. For example, the synthetic grass often allows the club face to swing through the ball unperturbed, even if sub-optimal contact has been made, such as for instance when the club engages the golf mat too far behind the ball.

Impact into the mat proximate the ball may also result in the ball being partially displaced prior to the club face engaging the ball, especially when the golf mat is too stiff, which may also lead to an inaccurate result as opposed to what the situation would have been had the ball been located on actual grass. In addition, it has been found that existing golf mats do not allow for effects such as spin to be properly simulated.

US 5595545 discloses a golf swing training apparatus having a circular track made by bending an elongate X-section extrusion of an aluminium alloy to form a plurality of partial circular track sections, which are then joined end-to-end to form a full 360 degree circular hoop. A multi-wheeled club guide cart rides on the track with a V-shaped circumference of each wheel mated to radially inner and outer opposed corner edges of the track member. The golf club includes a shaft of uniform diameter that rotates and slides in a linear bearing that in turn is connected by a pivot to the cart that allows rotation of the linear bearing and pivoting of the bearing for free movement of the golf club shaft in a plane orthogonal to that of the hoop throughout the swing.

US 4583740 discloses a device for teaching and practicing a proper golf swing, which enables the user to exercise and build the muscles necessary to a strong and effective golf swing, is provided for by this invention. The device consists of a tubular guide for directing a golf club during the proper swing, and a modified golf club with a weight mounted between two springs on said club for use with said device. The weight on the golf club is removable and thus may be varied depending upon the user's desired amount of weight. In addition to these benefits this invention is designed to allow the user to practice his or her golf swing while actually hitting a golf ball.

US patents 1567530, 2653025 and 3795399 all disclose golf swing training devices having arcuate tracks and carriages which are movable relative to the track. The carriages engage a shaft of a golf club so that a golfer can insert a golf club and swing the golf club in a defined way.

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None of the prior art devices teach a golf swing training device having a carriage which carriage is adapted to release the shaft of a golf club when relative movement between the carriage and the golf club occurs.

10 OBJECT OF THE INVENTION

It is accordingly an object of the invention to provide a golf teaching apparatus that will, at least partially, alleviate the above disadvantages.

15 It is a further object of the invention to provide a golf training apparatus that will be a useful alternative to existing golf training apparatuses.

It is yet a further object of the invention to provide a golf practising surface to be used in conjunction with the golf training apparatus according to the invention.

20

SUMMARY OF THE INVENTION

According to the invention there is provided a golf teaching apparatus including:

an elongate arcuate track;

25 a carriage being slidable along the track;

wherein the carriage includes receiving means for releasably receiving a shaft of a golf club.

30 The receiving means is adapted to release the shaft of the golf club when movement of the carriage relative to the track is stopped, but the movement of the golf club is maintained.

The receiving means may release the shaft of a golf club during an undesirable swing of the golf club. The receiving means may release the shaft of a golf club when
35 sufficient force is applied to the golf club.

The receiving means may be provided on a latching member that is pivotably connected to the carriage. Preferably the receiving means is in the form of two opposed, resilient tongue formations in between which the shaft of the golf club can be releasably engaged.

5

A further feature of the invention provides for the track to be held in a required position by way of a frame, the frame being adjustable so as to adjust the position and the inclination of the track.

- 10 The track may be at least partially circular, and preferably extends about three quarters about the circumference of a circle. There is provided for the track to be discontinuous, and thus to have a first end and a second end.

A further feature of the invention provides for the track to be in more than one plane.

15

The first end of the track preferably terminates in a tapered formation suitable for assisting in mounting the carriage onto the track.

- 20 The track preferably comprises a plurality of interconnected arcuate sections which are secured to one another in an end-to-end configuration so as to form the elongate arcuate track.

- 25 There is provided for the movement of the carriage relative to the track to be prevented when the carriage engages a swing plane guide member located adjacent and/or extending from the track.

- 30 The carriage may be rotatable about the track, and axial movement of the carriage relative to the track may be prevented by the swing plane guide member if the carriage rotates beyond a predetermined angle.

30

The swing plane guide member is preferably in the form of a connecting member that connects the track to a frame of the apparatus, and more preferably at least rear and bottom connecting members are provided.

- 35 There is further provided for the shaft of the golf club to be slideable relative to the latching member of the carriage, and in a preferred embodiment relative to the receiving means that releasably engages the shaft of the club.

At least one club displacement limiter may be securable to the shaft of the club so as to limit movement of the shaft relative to the latching member to a predetermined distance. More preferably, opposed club displacement limiters are securable to the shaft on opposing sides of the latching member.

Another feature of the invention provides for the apparatus to include at least one sensor. A first sensor for detecting the speed of a shaft of a golf club relative to the track may be placed along the length of the track. Preferably the sensor is included inside the track, the track having a window through which the sensor detects the speed of a club relative to the track. A second sensor for detecting the angle of a face of a golf club relative to the frame may also be included.

Yet a further feature of the invention provides for the apparatus to include a swing plane determiner. The swing plane determiner is preferably a movable elongate member extendable from a lower portion of the apparatus to an upper portion of the track. The elongate member is adjustable so that the swing plane of a number of golfers, all having differing swing planes, may be determined.

The frame may further include a leg movement stabiliser. The leg movement stabiliser is in the form of a projection which projects from the frame to contact the leg of a golfer. The stabiliser is movable along the length of the frame so that the stabiliser may contact legs of golfers having different heights.

Still a further feature of the invention provides for the apparatus to include a synthetic practising surface.

The track may be pivotably connectable to the practising surface. Preferably the track is pivotably connected to the practising surface by means of two bottom connecting members.

Still a further feature of the invention provides for the apparatus to include a further club displacement limiter for preventing a club engaged in the carriage from rotating beyond the club displacement limiter. The further club displacement limiter is a bar below the bottom of the track securable to the bottom connecting members of the frame.

The synthetic practising surface for use with the apparatus includes:

- a planar base;
- a sheet of synthetic grass located on one side of the base; and
- an intermediate compensation layer sandwiched between the planar base and the sheet of synthetic grass, wherein a preferred hitting zone is defined by a zone of the golf practicing surface where the intermediate compensation layer is sandwiched between the planar base and the sheet of synthetic grass.

- 10 The intermediate compensation layer may be made of a resilient material, and is preferably made from foam rubber or a material with similar properties.

- 15 The planar base is preferably made of a substantially rigid material, and more preferably from polyethylene or fibreglass. The planar base may also be steel-reinforced.

- 20 There is provided for the golf practising surface to include two separate sections, the two sections being pivotably connected to one another so as to be pivotable between an open position, where the two sections are located side to side for use as a practising surface, and a closed position wherein the two sections are located atop one another so as to reduce the total surface area of the golf practice surface, in so doing enabling easier conveyance and transportation of the golf practising surface.

- 25 There is further provided for only one of the two sections to include an intermediary compensation layer, and thus a preferred hitting zone, the other section being provided for a user of the golf practising surface to stand on.

- 30 A second aspect of the invention provides for the apparatus to be provided in a kit so that the apparatus may be assembled and disassembled.

A third aspect of the invention provides for a golf teaching apparatus comprising:

- an elongate track;
- a carriage; having a receiving means for receiving a shaft of a golf club and a sliding means for sliding along the track;
- wherein the sliding means is slidable along the length of the track and is rotatable about the track; and
- wherein the receiving means is pivotable relative to the sliding means

so that the carriage allows for freedom of movement of a shaft of a golf club relative to the track, and linear movement of the shaft relative to the receiving means.

- 5 A further feature of the invention provides for the track to be in more than one plane.

BRIEF DESCRIPTION OF THE DRAWINGS

10 A preferred embodiment of the invention is described by way of a non-limiting example, and with reference to the accompanying drawings in which:

Figure 1 is a front view of the golf teaching apparatus in accordance with the invention;

- 15 Figure 2 is a side view of the apparatus of figure 1;

Figure 3 is a perspective view of a latching member of the golf teaching apparatus;

- 20 Figure 4 is a perspective view of a sliding body of the golf training apparatus;

Figure 5 is a perspective view of a club displacement limiter forming part of the golf teaching apparatus;

- 25 Figure 6 is a perspective view of the carriage, comprising the latching member of figure 3 and the sliding body of figure 4;

Figure 7 is a plan view of a leg movement stabiliser forming part of the golf teaching apparatus;

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Figure 8 is a side view of a golf club having the club displacement limiters and the carriage attached thereto;

Figure 9 shows a golfer holding a golf club in an address stance, the golf club being connected to the golf teaching apparatus in accordance with the invention;

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- Figure 10 is a front view of a golfer holding a golf club, the golf club being connected to the golf teaching apparatus in accordance with the invention;
- 5 Figure 11 is a side view of a golf teaching apparatus in a second embodiment;
- Figure 12 is a schematic representation of the different stages of a back swing utilising the golf teaching apparatus;
- 10 Figure 13 is a schematic representation of the different stages of a down swing utilising the golf teaching apparatus; and
- Figure 14 is a schematic representation of the follow through of the golf swing utilising the golf teaching apparatus.
- 15 Figure 15 is a perspective view of the golf teaching apparatus connected to the golf practising surface in accordance with the invention;
- Figure 16 shows an exploded perspective view of the golf practising surface of Figure 15 in an open position;
- 20 Figure 17 is a perspective view of the golf practising surface in a partially closed position; and
- 25 Figure 18 is a perspective view of the golf practising surface in a fully closed position.

DETAILED DESCRIPTION OF THE INVENTION

- 30 Referring to the drawings, in which like numerals indicate like features, a golf training apparatus in accordance with the invention is generally indicated by reference numeral 10. The golf training apparatus, as is best seen in figure 10, includes a track 12, a carriage 14 being axially slideable relative to the track 12, and a frame 16 that keeps the track 12 in a required position.

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The track 12 is of a circular profile, and more particularly approximates three quarters of a circle. The track 12 is not continuous and thus includes a first end 18 and a

second end 20. The first end 18 includes a tapered guide formation 22, which in use facilitates easy engagement of the carriage 14 onto the track 12. The track 12 comprises a plurality of arcuate sections 24 which are connected end to end so as to form a substantially continuous track 12 between the first end 18 and the second end 20. The track 12 may be made from a material being substantially circular or tubular when viewed in cross-section. The second end 20 includes an elbow extension 21 which is connected to the second end 20 by a hinge 23. The elbow extension 21 is movable relative to the track 12 and also relative to the swing plane of a golfer. The elbow extension 21 prevents the carriage 14 from dismounting the track 12 at the second end 20 during a back swing of a golfer.

The track 12 is kept in a required position by way of a frame 16. The frame 16 includes a plurality of telescopic legs 26, the telescopic legs 26 each being connected at one end to the frame 16 at an upper point and another end being connected to a mat 28 of the frame 16 at least at one lower point 27. The track 12 is also pivotally connected to a golf practising surface in the form of a mat 28 that may also form part of the golf training apparatus 10. The frame 16 is connected to the track 12 at an upper connection point referred to as the rear connecting member 30. The frame 12 is further connected to the mat 28 by means of bottom connecting members 32.

The bottom connecting members 32 are pivotally connected to the mat 28 by means of pegs 33 extending from the bottom connecting members 32. The pegs 33 are insertable into a socket 35 located on the mat 28. The connecting members 30 and 32 also act as swing plane guiding members, as will be apparent from what follows hereinbelow. It will be appreciated that the telescopic functionality of the legs 26 of the frame 16, combined with the pivotable connection to the golf mat 28, or other surface to which the golf training apparatus 10 may be connected, allows for the track 12 to be adjustable to various angularly offset configurations relative to the surface on which the apparatus 10 is used. This allows different swing planes, and thus different club lengths, to be used in combination with the golf training apparatus 10. The frame 16, as discussed above, is best seen in Figures 1 and 2.

Referring to Figures 3 to 6, a carriage used in the golfing apparatus 10 is indicated by reference numeral 14. The carriage 14 comprises a sliding body 34 as well as a latching member 36, respectively shown in Figures 4 and 3. The sliding body 34 has a channel 38 provided therethrough, the channel 38 being suitably configured and

dimensioned slidably to engage the track 12 of the golf training apparatus 10. Wheels 40 are provided in order to ensure smooth actual movement of the sliding body 34 relative to the track 12. The latching member 36 includes a body 42, with a receiving means 44 extending from the body. The receiving means 44 comprises two opposing resilient tongue formations 46 that are adapted releasably to clamp the shaft of a golf club therebetween. In use, as is seen in Figures, 3,4 and 6, the latching member 36 is pivotally connected to the sliding body 34 so as to form a carriage 14 in which a club, engaged by the latching member 36, would be able to pivot relative to the sliding body 34. The pivotable connection is achieved by means of a bolt 45 extending from the latching member 36 which is insertable into an aperture 39 in the sliding body 34 and secured by a nut (not shown). This pivotable configuration will allow a proper golf swing to be executed while the carriage 14 is displaced along the track 12.

Figure 8 shows a golf club 48 being ready for use with the golf training apparatus 10. The latching member 36 of the carriage 14 has been secured to the shaft 50 of the golf club 48, and the sliding body 34, and in particular the channel 38 provided in the sliding body 34, can now engage the first end 18 of the track 12.

Also shown in Figure 8 are two club displacement limiters 52, which are secured to the shaft 50 of the golf club 48 so as to limit the displacement of the club shaft 50 relative to the latching member 36 and thus the carriage 14. A club displacement limiter 52 is shown in more detail in Figure 5. The club displacement limiter 52 is a body 54 with a slot 56 therein. A shaft 50 of a golf club 48 is insertable into the slot 56 of the club displacement limiter 52. The body 54 of the club displacement limiter 52 has two opposing lip formations 58, each lip formation 58 having an aperture through which a bolt 60 can pass. The body 54 is secured onto the shaft 50 by passing a bolt 60 through both apertures and securing the bolt 60 with a nut 62 as shown in figure 5. In this manner the slot 56 is closed so that the body 54 of the club displacement limiter 52 is secured to the shaft 50 of the golf club 48 as shown in figure 8.

A further club displacement limiter in the form of a bar 64 is securable to the bottom connecting members 32 of the apparatus 10, as shown in figure 1. The bar 64 extends between the two bottom connecting members 32 so that the bar 64 is substantially horizontal above the mat 28 and above a golf ball when positioned on the mat 28. The bar 64 will prevent the shaft 50 of a golf club 48 held in the carriage

14 from rotating downwards beyond the bar 64. Such rotational movement of the golf club 48 is caused by the position of a golfer's shoulders, arms and back while preparing for the back swing, as well as during the forward swing. The incorrect positioning and movement of the shoulders, arms and back during the swing is
5 corrected, as certain movements will be prevented due to the presence of the bar 64. The position of the bar 64 is adjustable to accommodate the height and stance of different golfers.

A swing plane determiner in the form of a flexible chord 68 is provided, as shown in
10 figure 10. The chord 68 includes a hook 70 at one end so that is attachable to the mat 28, preferably at a position on the mat 28 in front of a ball 66 to be hit. The chord 68 is then extended to an upper portion of the track 12 and attached via another hook 70 at the opposite end of the chord 68. It will be appreciated that an apparatus according to the invention may be adapted to accommodate left and right-handed
15 golfers. A shoulder and leg of a golfer that are closest to the track are referred to as a trailing shoulder and trailing leg respectively. The correct position of attachment of the chord 68 to the upper portion of the track 12 is determined by ensuring that the chord 68 passes over the middle of a clavicle of a golfer's trailing shoulder. The swing plane determiner will assist in indicating the most suitable inclination of the
20 track 12 relative to the frame 16 or mat 28 for a particular golfer as the chord 68 will be in a straight line extending from the mat 28, over the golfer's shoulder to the top of the track 12. In this manner the swing plane of a number of golfers, all having differing heights and therefore swing planes, may be determined and the correct inclination of the track 12 selected.

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From the above description it is clear that a number of degrees of freedom are required to give effect to proper operation of the apparatus, whilst certain relative displacements must be limited or prevented altogether so as to ensure that a proper golf swing is simulated. It is for instance of utmost importance that the carriage 14
30 can freely be actually displaced relative to the track 12, and also that the club shaft 50 can slide in the latching member 36 during the course of the golf swing. Due to the configuration of the golf training apparatus 10, the carriage 14 and more particularly the sliding body 34, can also rotate about the track 12. However, the degree of rotation must in this instance be limited, so as to ensure that a uniform
35 swing plane is obtained. The rear 30 and bottom 32 connecting members therefore act as swing plane guide members, which will prevent sliding of the carriage 14 if the carriage 14 has rotated beyond a pre-determined limit. Should the pre-determined

limit be exceeded, the carriage 14 will catch on the connecting members 30 and 32, and further movement of the carriage 14 relative to the track 12 will be prevented. The golf club 48, and more particularly the club shaft 50, will then disengage from the latching member 36 so as to ensure that no damage is caused to the club, the
5 apparatus or the golfer.

The apparatus includes a leg stabiliser in the form of a connectable rod 72 which may be connected to a telescopic leg 26 of the frame 12 as shown in figure 2. The rod 72 includes a connecting member 74 which includes an aperture 76 as shown in
10 figure 7. The aperture 76 includes a screw-threaded hole 78 for receiving a locking screw 80. The aperture 76 may be slid onto the bottom of a telescopic leg 26 and secured, in any position along the length of the telescopic leg 26, by tightening the locking screw 80. The rod 72, at the free end thereof, includes a concave plate 82. The rod 72 is positioned so that the plate 82 contacts and abuts
15 the trailing leg of a golfer. The plate 82, supported by the rod 72 and the frame 12, will limit the movement of the leg of the golfer during the swing. By limiting the movement of the leg, rotational movement of the golfer's hips is also limited, thereby encouraging correct movement of an entire body of a golfer.

20 The track 12 may further include a number of sensors. A first sensor 84 for detecting the speed of the back swing or down swing of a golfer is placed inside the tubular track 12 as shown in figure 1. A window 86 is provided in the track 12 at the position where the sensor 84 is placed so that, as the carriage 14 connected to the golf club 48 passes over the window 86, the sensor 84 detects the speed of the carriage 14
25 relative to the track 12. In this way the speed of either a back swing or down swing may be determined.

A second sensor (not shown) is included in the apparatus 10 for detecting the angle of the face 88 of a golf club 48 which rests on the mat 28. The sensor is attachable to
30 the connecting member 32 of the track 12. The sensor will indicate the correct angle of the face 88 of the golf club 48 and alert the golfer so that he may adjust the angle of the club face 88. The angle of the face 88 of the golf club 48 is important, as an incorrect angle will result in the face 88 of the golf club engaging the ball 66 incorrectly and the shot being off course.

In use, best seen in Figures 10 to 14, a golfer attaches his or her club 48 to the latching member 36, and the sliding body 34 is then slid onto the semi-circular track 12 while the club 48 is connected to the carriage 14. The golfer then attaches the club displacement limiter 52 to the golf club shaft 50, and sets it to a height on the shaft 50 of the golf club 48 that is equal to the distance between the club head, when grounded directly behind a ball, and the carriage 14. The purpose of the club displacement limiter 52 is to prevent the player from pulling upwards as he or she attempts to strike a golf ball 66.

As the club 48 is swung, it is constrained to move in a pre-determined plane by way of the carriage 14 engaging the track 12 throughout the entire back swing. The player will also not be able to sway too far sideways as either the club displacement limiter 52, or the club diameter relative to the latching member 36, will prevent the club from being excessively displaced relative to the carriage 14. The player will further be limited by the leg movement stabiliser 72 which limits movement of the legs of the player. The elbow extension 21 at the second end 20 will prevent the carriage 14 from dismounting the track 12 during a back swing of a golfer.

At the top of the back swing the player will be forced to stay on the pre-determined plane by means of the rear connecting member 30 which acts as a rear swing plane guide member. On the back swing, the carriage 14 will slide over the rear-connecting member 30 at the top of the back swing. However, should the player alter his or her swing plane on the back swing, the carriage 14 will not be able to glide over the rear-connecting member 30 due to the excessive rotation of the carriage 14 about the track 12, thus informing the player of the deviation in the swing plane.

On the down swing the rear connecting member 30 will in the same way as above stop the down swing when the swing plane is altered. Should an excessive amount of force be applied to the club 48, the club 48 will shoot out of the latching member 36, resulting in the carriage 14 staying on the track 12. This will again let the player know that he or she has altered his or her swing plane. During the down swing, the bottom connecting member 32 also acts as a swing plane guide member in that the bottom connecting member 32 will prevent the player from changing his or her swing plane, as any change in the swing plan will cause the carriage 14 to be stopped by the bottom connecting member 32. Again the club 48 will be released from the carriage 14 if excessive force is applied to the golf club 48. The carriage 14 will then

remain on the track 12 without the golf club 48 attached to it, thus informing the player of the change in the swing plane. During the downswing of a golfer, the carriage 14 will slide along the track 12 until the first end 18 is reached. The carriage 14 will then dismount the track 12 at the first end 18 so that the follow-through movement of the golfer can occur. During the follow-through movement, the golf club is swung upwards following a swing plane. If the follow-through swing plane is not correct, the golf club will strike the elbow extension 21 connected to the second end 20 of the track 12.

10 The hinge 23 connecting the elbow extension 21 to the second end 20 of the track 12 allows the elbow extension to be adjusted to suit the follow-through swing of different golfers.

15 In a preferred environment of the invention the tongue formation 46 of the latching member 36 will be defined by a circular shaft holding channel 38 with a diameter of not less than 7mm and not greater than 14mm, a 7.5mm groove being provided in said circular shaft holding channel 38 so as to allow the shaft 50 to be releasable relative to the latching member 36. In this embodiment the sliding body 34 will include wheels 40 to facilitate smooth displacement of the sliding body 34 relative to the track 12, but it will be appreciated that many other friction reducing configurations, such as bearings or even PTFE sleeves can be used to achieve the same functionality.

25 Also, in this preferred embodiment the track 12 will consist of 4 to 5 segments 24 of equal length, which segments are connected to one another to form a three quarter circle. The inclination of the track 12 is typically adjustable to any position within a 70 degree range.

30 The golf teaching apparatus in one embodiment may be attachable to a golf practising surface 28 as shown in figure 15. The golf practising surface 28 includes a planar base 90, a synthetic mat 92 and an intermediate compensation 94 layer at least partially sandwiched therebetween.

35 The planar base 90, as is best seen in Figure 16, is made from a substantially rigid material such as fibreglass or polyethylene, and comprises a shoulder 96 that surrounds a flat surface 98 being adapted for receiving the synthetic mat 92 and the intermediate compensation layer 94. The planar base 90 furthermore comprises a

first section 100 and a second section 102, the first section 100 and the second section 102 being connected to one another by way of a hinge 104 so as to be pivotable between an open position where the first section 100 and the second section 102 are located side by side, and a closed position when the first section 100 and the second section 102 are located atop one another as shown in figures 15, 17 and 18.

A synthetic mat 92, which comprises a substrate with synthetic grass being provided thereon, is secured to the flat surface 98 of the planar base 90. At least one aperture 106 is provided for receiving the intermediate compensation layer 94, as well as a further synthetic mat 108. The further synthetic mat 108 is a specially designed synthetic mat that resembles the actual feel and grip of a grass surface found on an actual golf course. In particular the height of the pile of the mat is between 7 and 13mm.

The intermediate compensation layer 94 is also secured to the flat surface 98 of the planar base 90, and the further synthetic mat 108 is secured on top of the intermediate compensation layer 94, thus sandwiching the intermediate compensation layer 94 between the flat surface 98 of the rigid planar base 90 and the further synthetic mat 108. There is also provided for the intermediate compensation layer 94 to extend over the entire surface of the planar base 90, in which case only one synthetic mat will cover the entire upper surface of the intermediate compensation layer 94. In such case the cross sectional configuration of the golf practising surface 28 will be uniform throughout the length of the golf practising surface 28.

However, in the preferred embodiment shown in the drawings, the intermediate compensation layer 94 is only provided at one end zone of the golf practising surface 28, so as to define a hitting section 110 as well as a standing section 112. The configuration is such that the hitting section 110 and standing section 112 can pivot relative to one another in order for the entire golf practising surface 28 to be moveable between an open position and a closed position as shown in figures 17 and 18. A preferred hitting zone is defined by the area where an intermediate compensation layer 90 is present.

In a second embodiment of the invention, as shown in figure 11, the track 12 is curved in such a way that the track 12 is not in a single plane. Such a track 12 will

allow for further freedom of movement of a golf swing. Studies of the golf swings of many professional golfers have shown that a normal golf swing does not have a consistent plane but follows the track 12 as shown in figure 11.

- 5 It is foreseen that the addition of an intermediate compensation layer 90 made from a soft but resilient material, such as foam rubber, will result in the dynamics of a club face engaging a golf ball approximating that of real life conditions when a golf ball is positioned on actual grass. The inventor has found that effects such as spin, hitting divots, and hitting a ball thick or fat, are very close to real life conditions when this particular golf practising surface 28 is utilized. Also, the golf practising surface 28 is
10 easy to transport and to convey due to the entire assembly being foldable as a result of the hinged configuration.

- It will be appreciated that the above describes only two embodiments of the
15 invention, and that there may be many variations in detail without departing from the spirit and/or the scope of this invention. For example, in another embodiment of the invention one bottom connecting member may be provided. Also, the second sensor may be located inside the mat in the hitting section. Also, the swing plane may be limited in different ways. For instance, the carriage may be adapted to be slideable
20 relative to the track, but not rotatable, in so doing preventing rotation of the club, and thus deviation from the required swing plane. This may for instance be achieved by providing complementary engagement formations (e.g. tongue and groove) on the track and the carriage.

Claims:

1. A golf teaching apparatus comprising:
an elongate arcuate track;
5 a carriage being slidable along the track;
wherein the carriage includes a receiving means for releasably receiving a shaft of a golf club;
- 10 2. A golf teaching apparatus according to claim 1 wherein the receiving means releases the shaft of a golf club during an undesirable swing of the golf club.
- 15 3. A golf teaching apparatus according to any one of claims 1 or 2 wherein the receiving means releases the shaft of a golf club when sufficient force is applied to the golf club.
- 20 4. A golf teaching apparatus according to any one of claims 1 to 3 wherein the receiving means is adapted to release the shaft of the golf club when movement of the carriage relative to the track is stopped, but the movement of the golf club is maintained in a predetermined direction and of sufficient force.
- 25 5. A golf teaching apparatus according to any one of the preceding claims wherein the receiving means is provided on a latching member that is pivotably connected to the carriage.
- 30 6. A golf teaching apparatus according to any one of the preceding claims wherein the receiving means is two opposed, resilient tongue formations in between which the shaft of the golf club can be releasably engaged.
7. A golf teaching apparatus according to claim 1 wherein the track is held in a required position by a frame.
- 35 8. A golf teaching apparatus according to claim 7 wherein the frame is adjustable so as to adjust the position and the inclination of the track.

9. A golf teaching apparatus according to any one of the preceding claims wherein the apparatus includes a swing plane guide member.

10. A golf teaching apparatus according to claim 9 wherein the swing plane guide member prevents movement of the carriage relative to the track when the carriage strikes a swing plane guide member.

11. A golf teaching apparatus according to any one of claims 9 or 10 wherein the swing plane guide member is a connecting member that connects the track to a frame of the apparatus.

12. A golf teaching apparatus according to claim 11 wherein rear and bottom connecting members are provided.

13. A golf teaching apparatus according to any one of claims 9 to 12 wherein the carriage is rotatable about the track, and axial movement of the carriage relative to the track is prevented by the swing plane guide member if the carriage rotates beyond a predetermined angle.

14. A golf teaching apparatus according to any one of claims 1 to 13 wherein a shaft of a golf club is slideable relative to the receiving means.

15. A golf teaching apparatus according to any one of claims 5 to 13 wherein a shaft of a golf club is slideable relative to the latching member.

16. A golf teaching apparatus according to any one of the preceding claims wherein the apparatus includes a club displacement limiter.

17. A golf teaching apparatus according to 16 wherein the club displacement limiter is securable to the shaft of the club so as to limit movement of the shaft relative to the latching member to a predetermined distance.

18. A golf teaching apparatus according to any one of claims 16 or 17 wherein the club displacement limiter is a stopper.

19. A golf teaching apparatus according to any one of claims 16 or 17 wherein the club displacement limiter is two stoppers securable to the shaft of the golf club on opposing sides of the latching member.
- 5 20. A golf teaching apparatus according to any one of claims 1 to 19 wherein a second club displacement limiter is a bar below the bottom of the track securable to the connecting members of the frame.
- 10 21. A golf teaching apparatus according to any one of claims 1 to 20 wherein the track is partially circular.
22. A golf teaching apparatus according to any one of claims 1 to 21 wherein the track is discontinuous having a first end and a second end.
- 15 23. A golf teaching apparatus according to any one of claims 21 or 22 wherein the track extends three quarters about the circumference of a circle.
- 20 24. A golf teaching apparatus according to claim 22 wherein the first end of the track is a tapered formation suitable for assisting in mounting the carriage onto the track.
- 25 25. A golf teaching apparatus according to any one of claims 1 to 24 wherein the track has a plurality of interconnected arcuate sections which are secured to one another in an end-to-end configuration so as to form the elongate arcuate track.
- 30 26. A golf teaching apparatus according to any one of claims 1 to 25 wherein the track includes a sensor.
27. A golf teaching apparatus according to claim 26 wherein the sensor is a sensor for detecting the speed of a shaft of a golf club relative to the track.
- 35 28. A golf teaching apparatus according to any one of claims 26 or 27 wherein the sensor is placed along the length of the track.

29. A golf teaching apparatus according to any one of claims 26 to 28 wherein the sensor is included inside the track, the track having a window through which the sensor detects the speed of a club relative to the track.

5 30. A golf teaching apparatus according to claim 26 wherein the sensor is a sensor for detecting the angle of a face of a golf club relative to the frame.

31. A golf club teaching apparatus according to any one of claims 1 to 30 wherein the apparatus includes a swing plane determiner.

10 32. A golf club teaching apparatus according to claim 31 wherein the swing plane determiner is a movable elongate member extendable from a lower portion of the apparatus to an upper portion of the track.

15 33. A golf club teaching apparatus according to any one of claims 31 or 32 wherein the swing plane determiner is adjustable so that the swing plane of a number of golfers, all having differing swing planes, may be determined.

20 34. A golf club teaching apparatus according to any one of claims 7 to 33 wherein the frame includes a leg movement stabiliser.

25 35. A golf club teaching apparatus according to claim 34 wherein the leg movement stabiliser is a projection which projects from the frame to contact the leg of a golfer.

30 36. A golf club teaching apparatus according to any one of claims 34 or 35 wherein the leg movement stabiliser is movable along the length of the frame so that the stabiliser may contact legs of golfers having different heights.

37. A golf club teaching apparatus according to any one of claims 1 to 36 wherein the apparatus includes a synthetic practising surface comprising:
a planar base;

35 a sheet of synthetic grass located on one side of the base; and
an intermediate compensation layer sandwiched between the planar base and the sheet of synthetic grass, wherein a preferred hitting zone is

defined by a zone of the golf practicing surface where the intermediate compensation layer is sandwiched between the planar base and the sheet of synthetic grass.

5 38. A golf club teaching apparatus according to claim 37 wherein the intermediate compensation layer is made of a resilient material.

39. A golf club teaching apparatus according to any one of claims 37 to 38 wherein the intermediate compensation layer is made from foam rubber.

10

40. A golf club teaching apparatus according to any one of claims 37 to 39 wherein the planar base is made of a substantially rigid material.

15

41. A golf club teaching apparatus according to any one of claims 37 to 39 wherein the planar base is made of a material selected from the group consisting of polyethylene and fibreglass.

20

42. A golf club teaching apparatus according to any one of claims 37 to 41 wherein the planar base is steel-reinforced.

43. A golf club teaching apparatus according to any one of claims 37 to 42 wherein the golf practising surface includes two separate sections.

25

44. A golf club teaching apparatus according to claim 43 wherein the two sections are pivotably connected to one another so as to be pivotable between an open position, where the two sections are located side to side for use as a practicing surface, and a closed position wherein the two sections are located atop one another so as to reduce the total surface area of the golf practice surface.

30

45. A golf club teaching apparatus according to any one of claims 43 or 44 wherein one of the two sections includes an intermediary compensation layer forming a preferred hitting zone.

35

46. A golf teaching apparatus comprising:
 an elongate track;

a carriage; having a receiving means for receiving a shaft of a golf club and a sliding means for sliding along the track;
wherein the sliding means is slidable along the length of the track and is rotatable about the track; and

5 wherein the receiving means is pivotable relative to the sliding means so that the carriage allows for freedom of movement of a shaft of a golf club relative to the track, and linear movement of the shaft relative to the receiving means.

10 47. A golf teaching apparatus as claimed in any one of claims 1 to 46 wherein the track is not in a single plane.

1/14

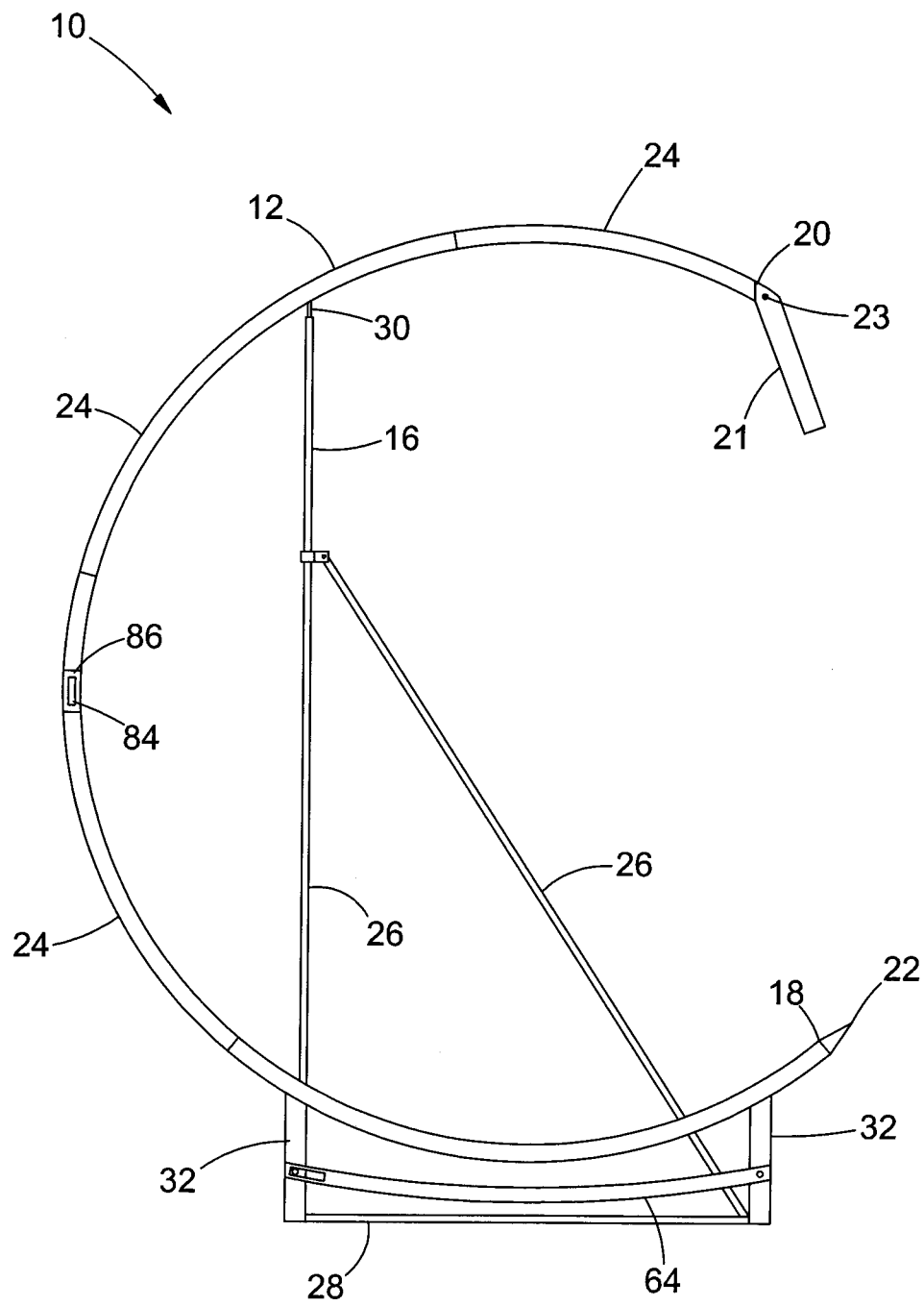
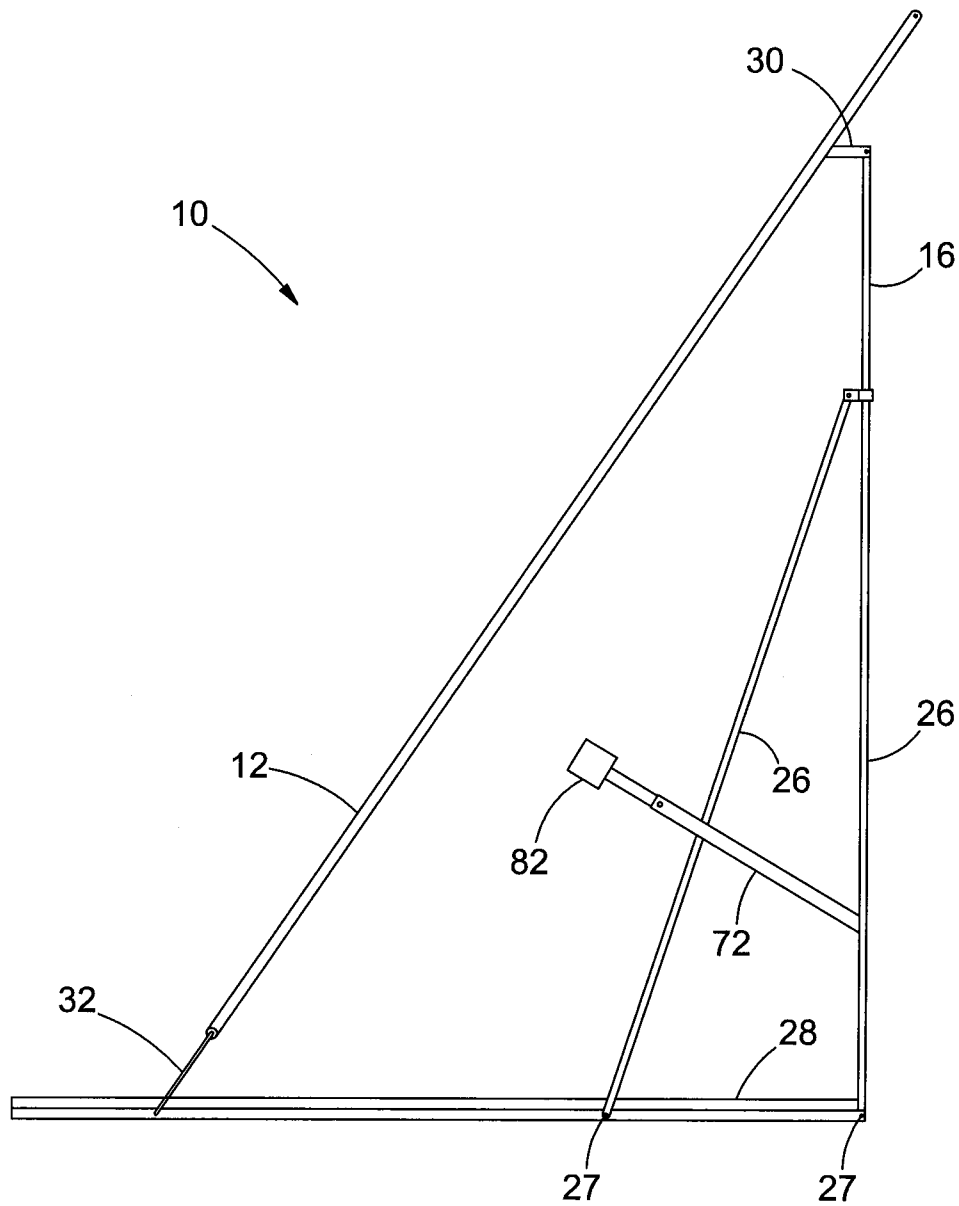


FIGURE 1

2/14

FIGURE 2

3/14

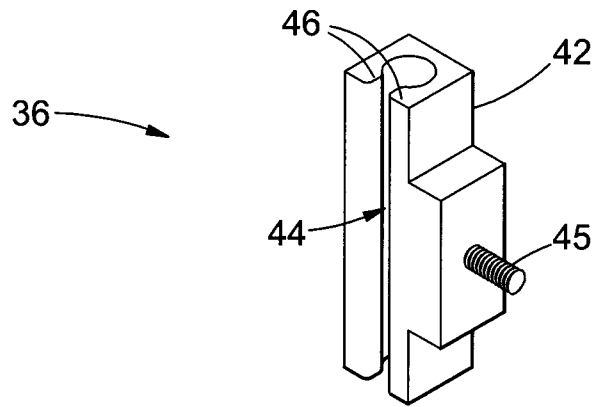


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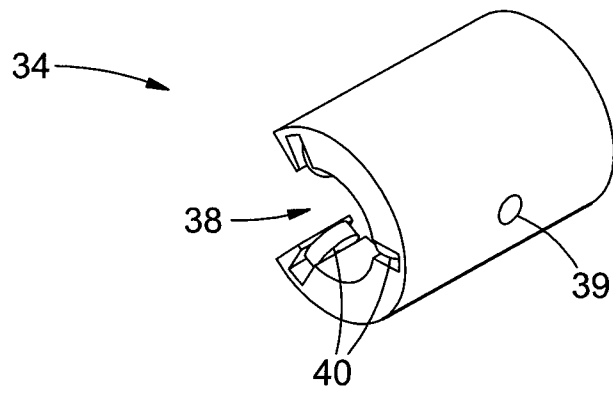


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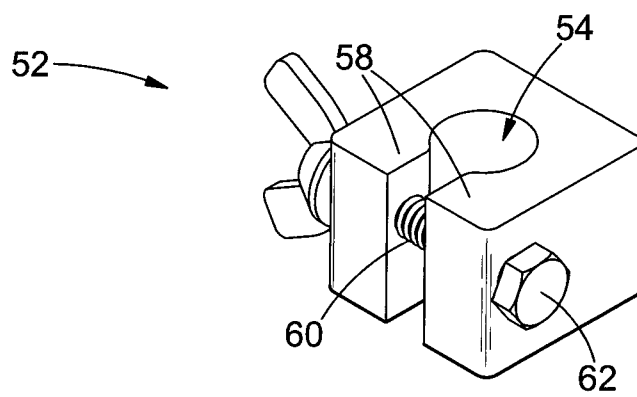


FIGURE 5

4/14

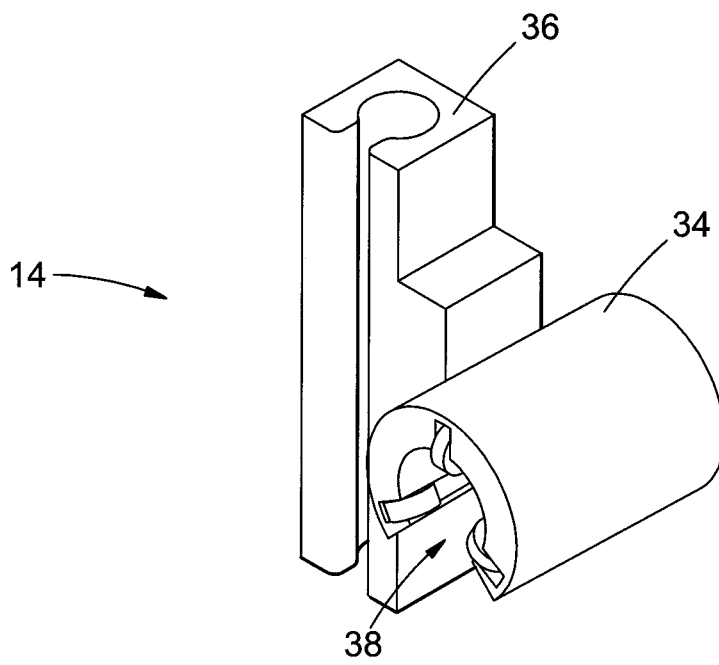


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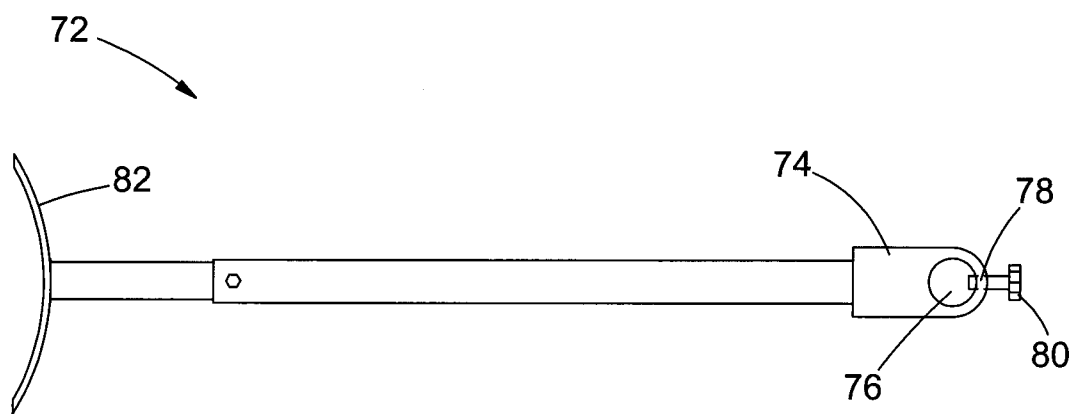


FIGURE 7

5/14

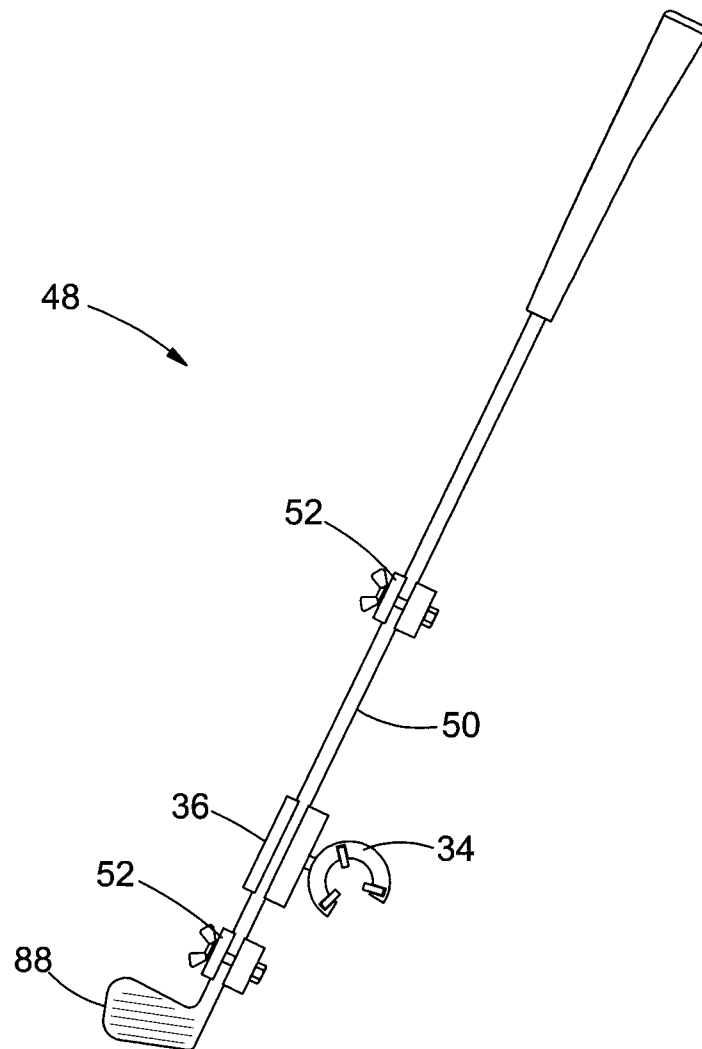


FIGURE 8

6/14

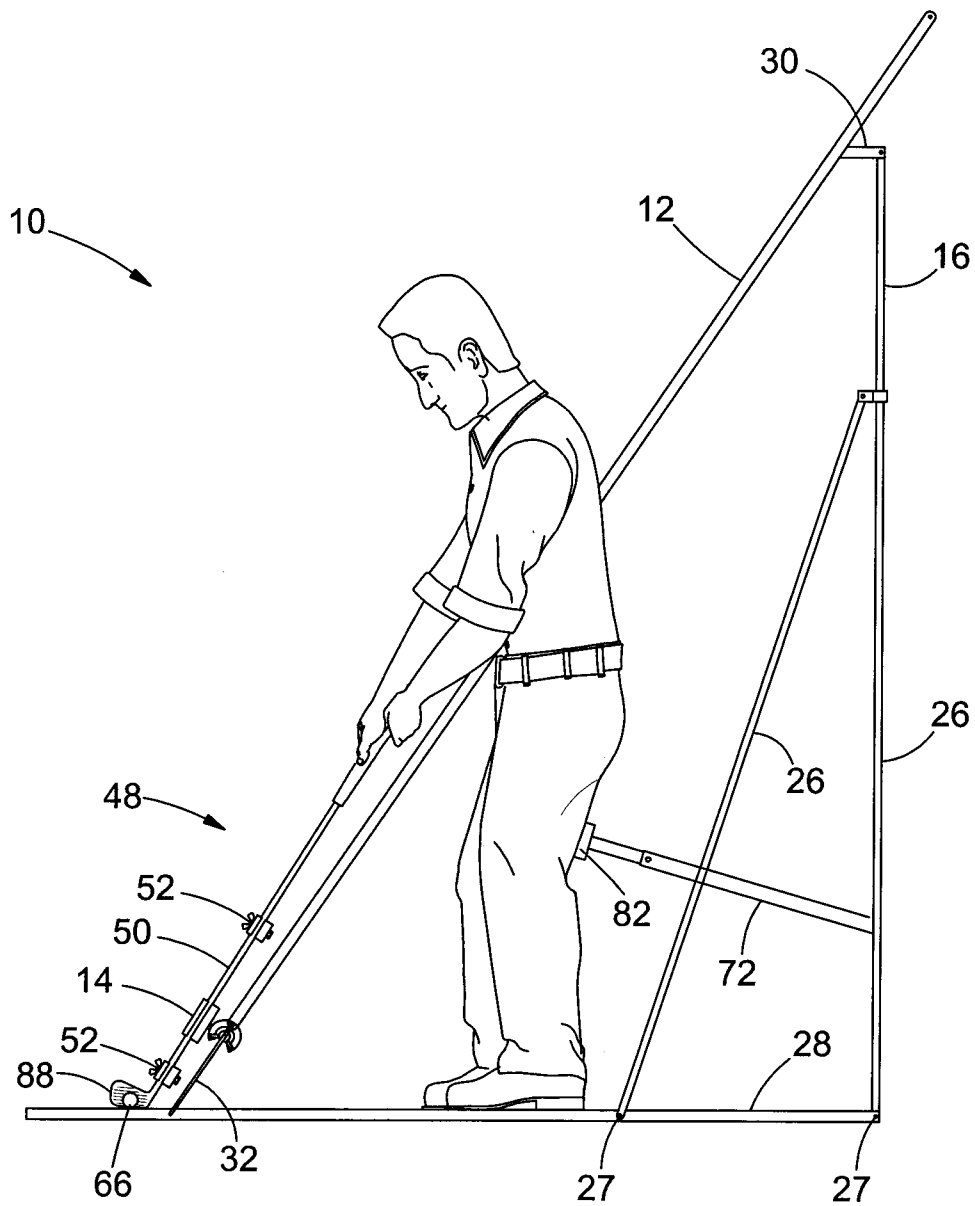


FIGURE 9

7/14

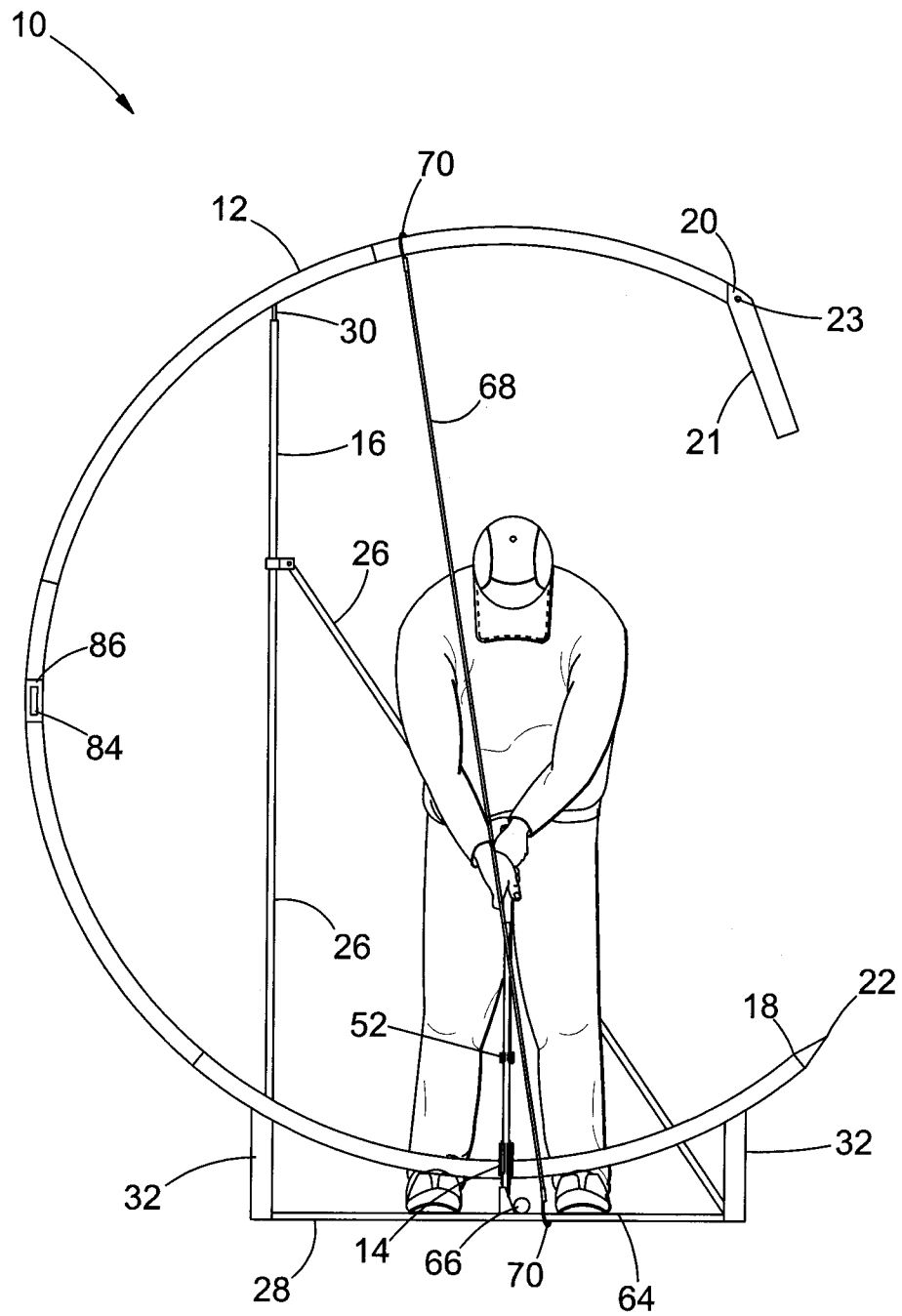


FIGURE 10

8/14

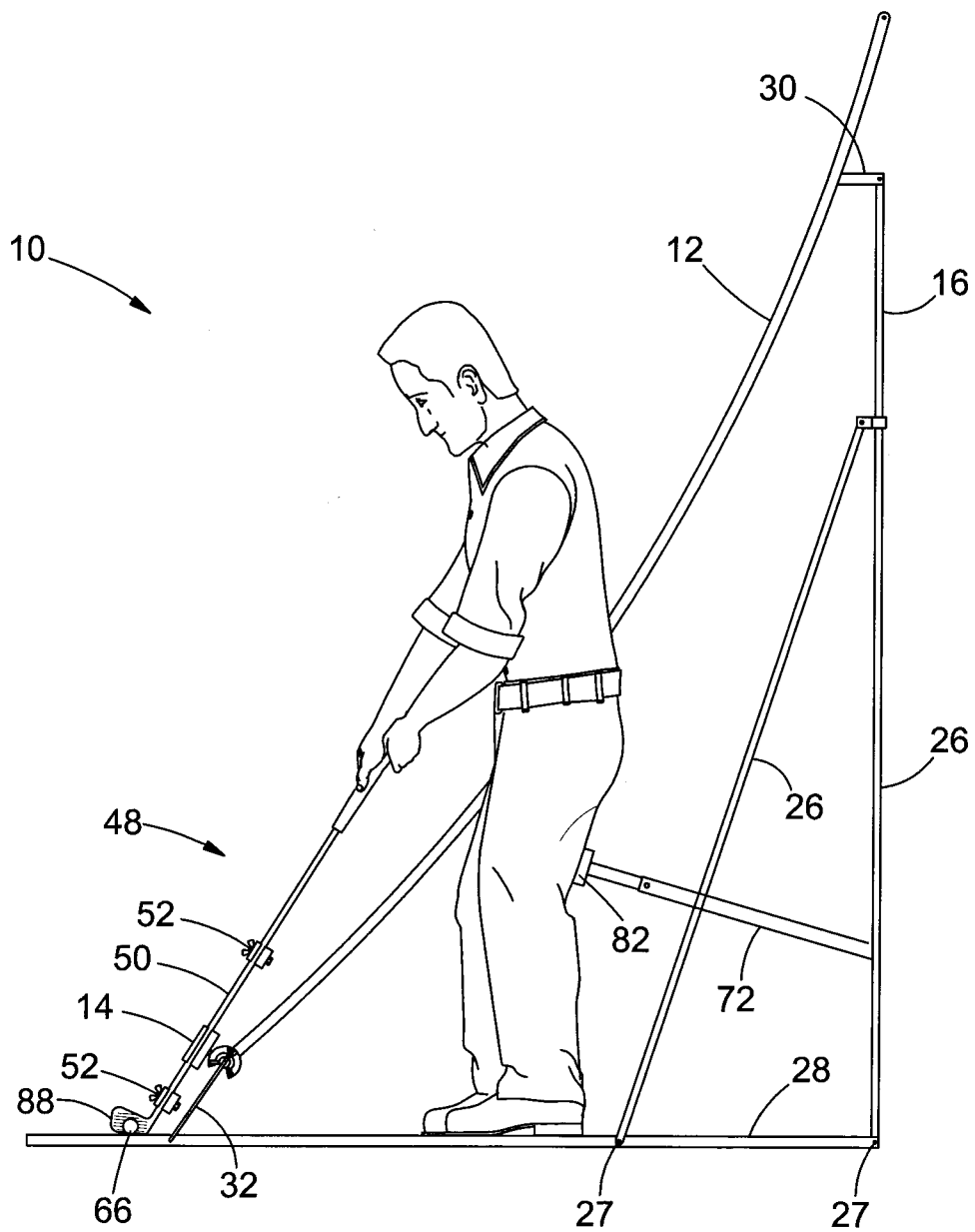


FIGURE 11

9/14

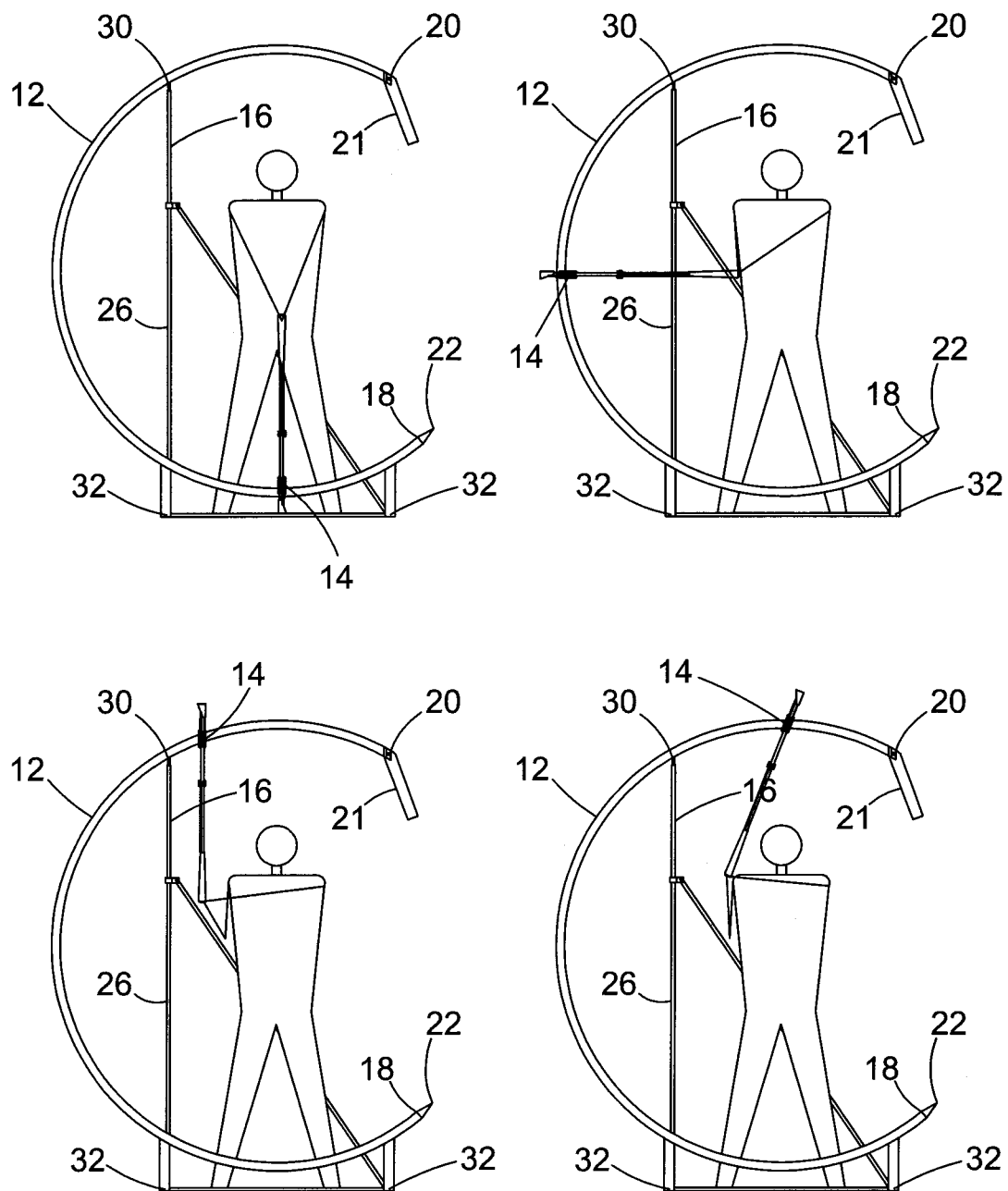


FIGURE 12

10/14

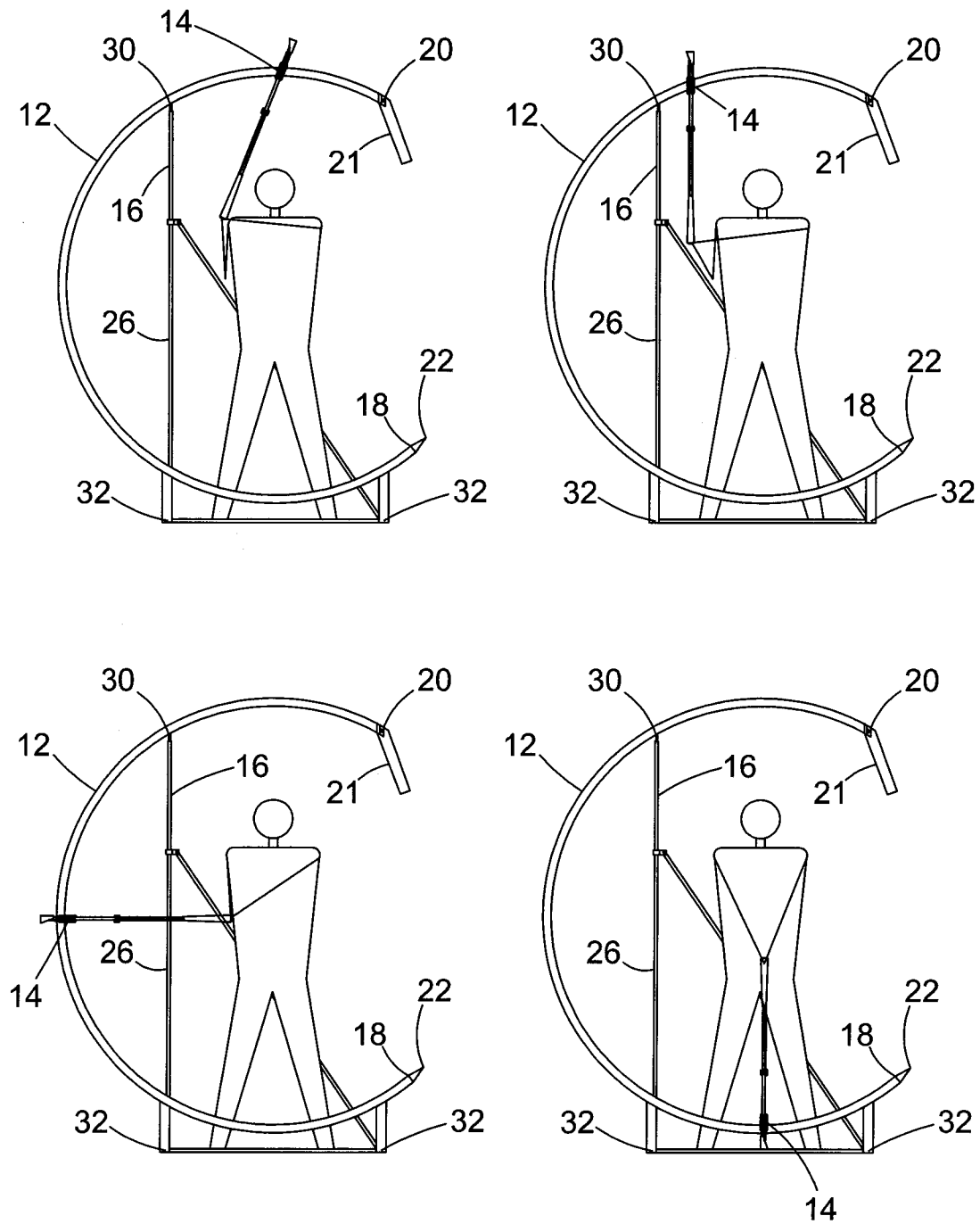


FIGURE 13

11/14

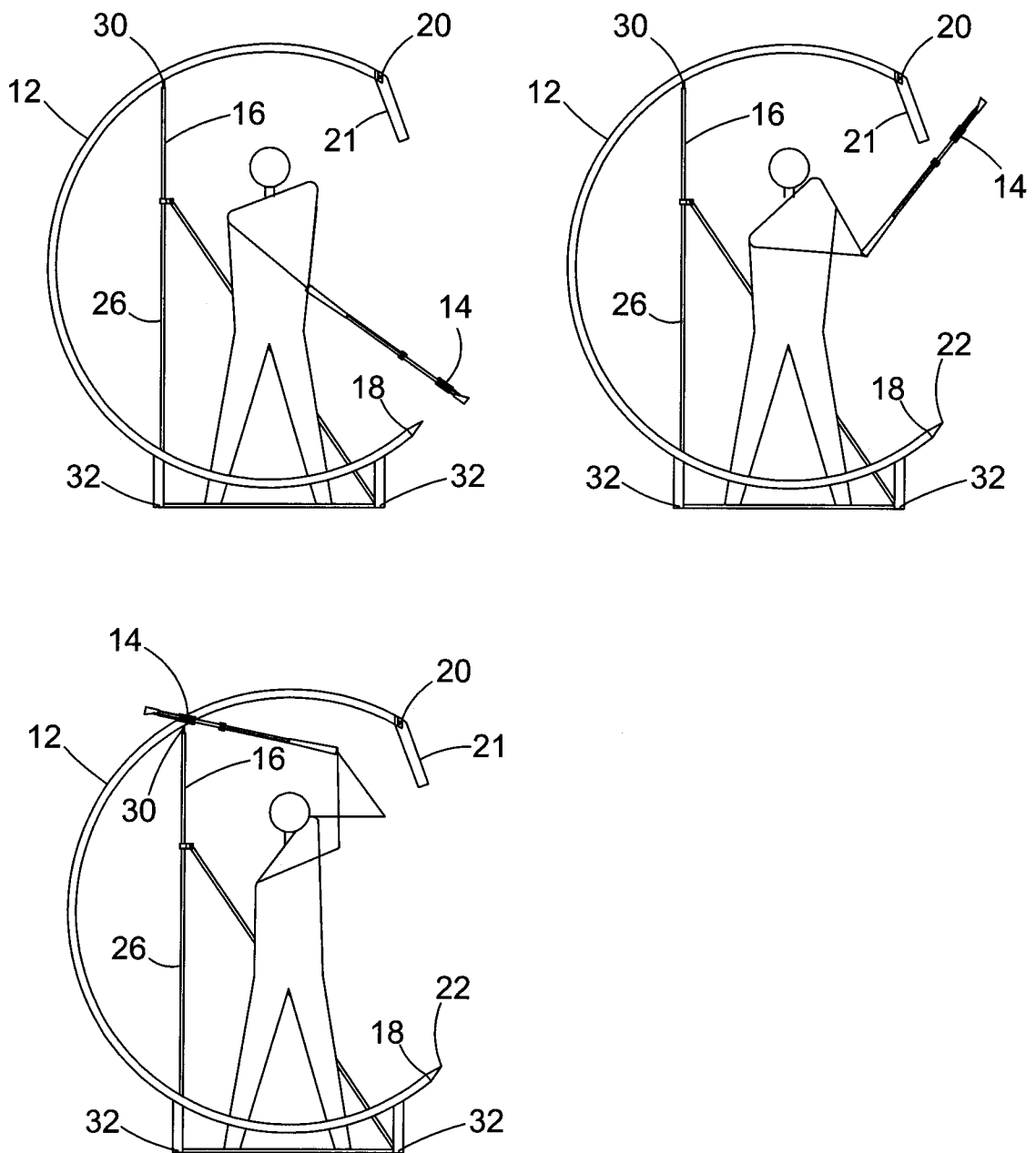


FIGURE 14

12/14

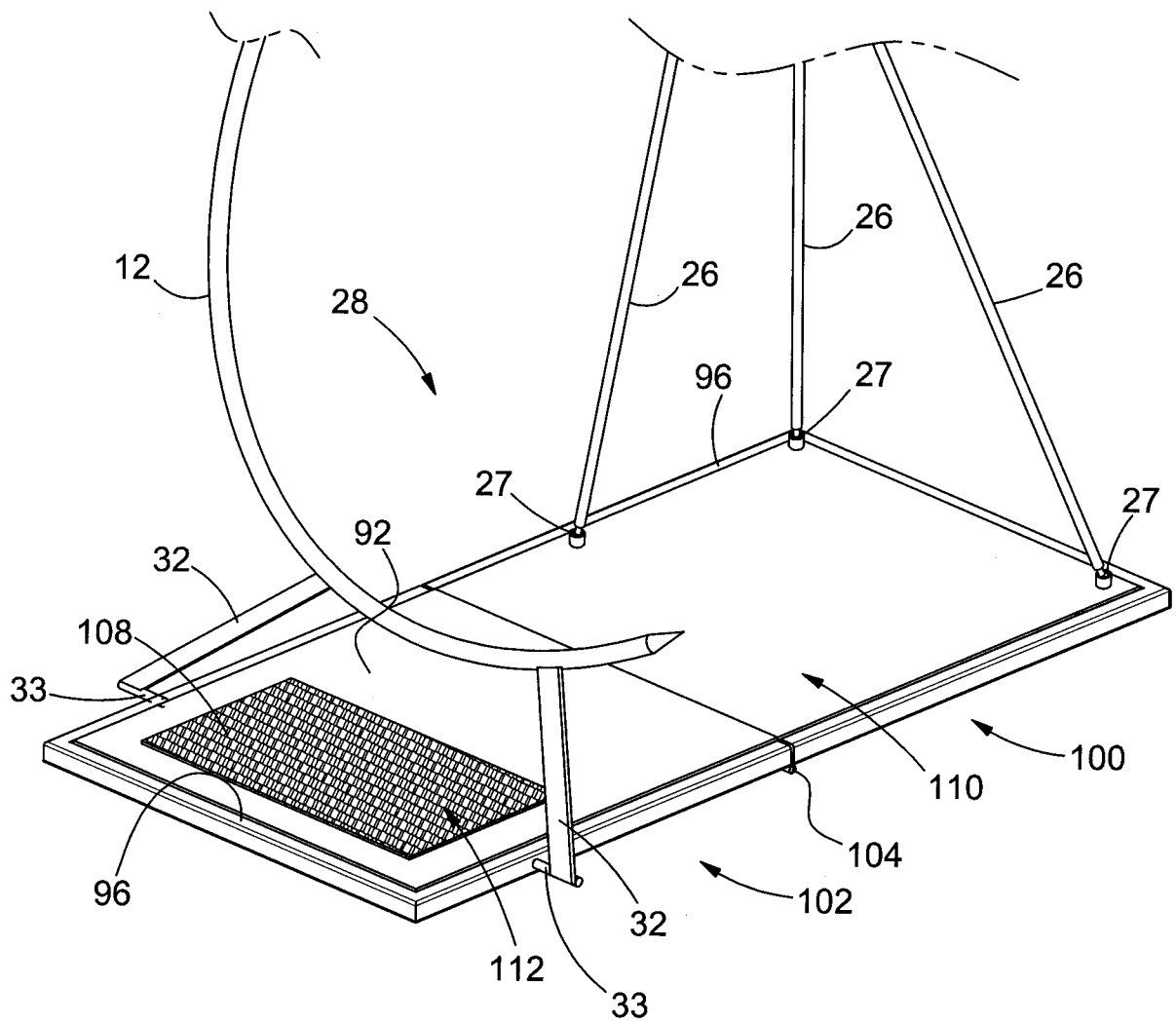


FIGURE 15

13/14

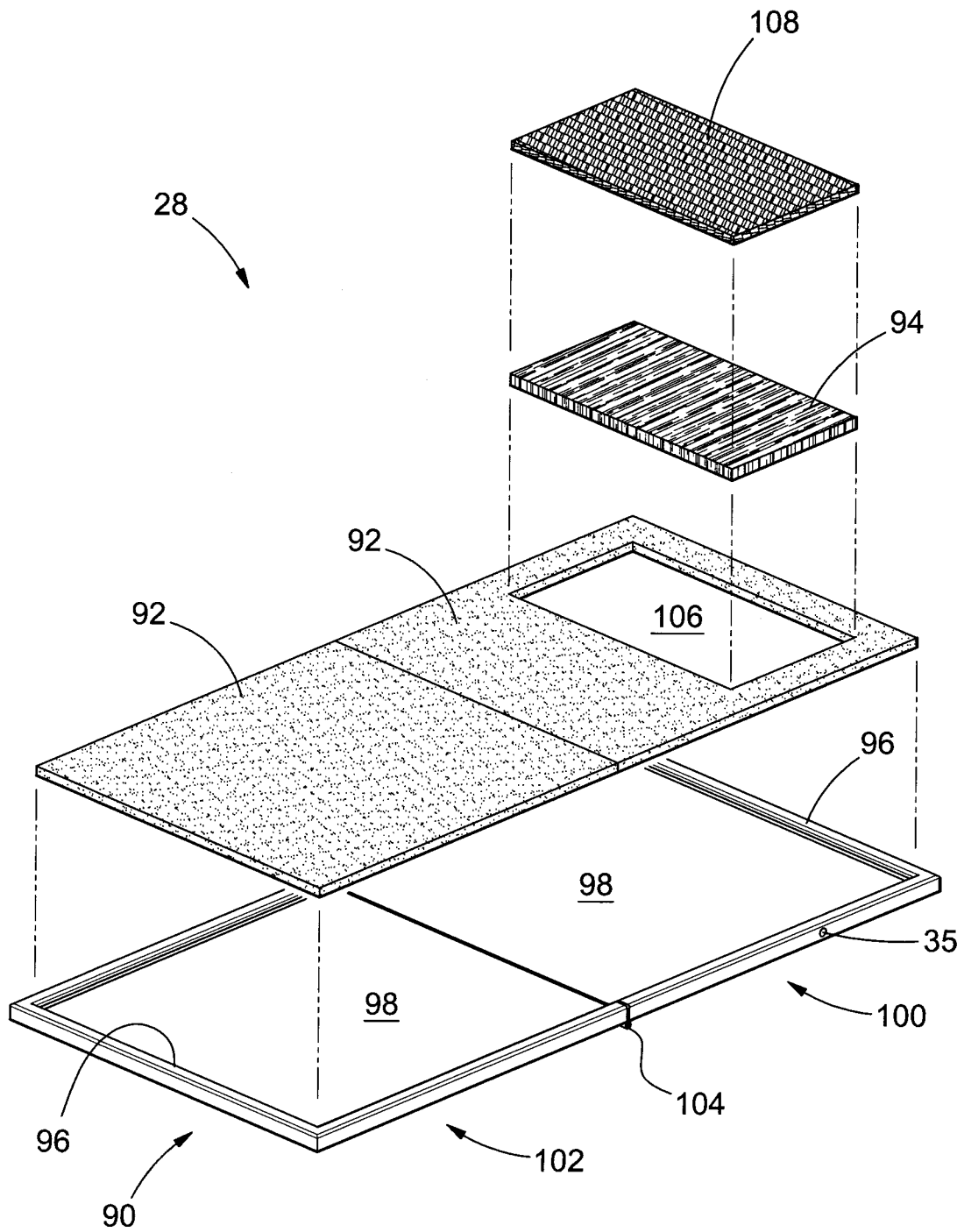


FIGURE 16

14/14

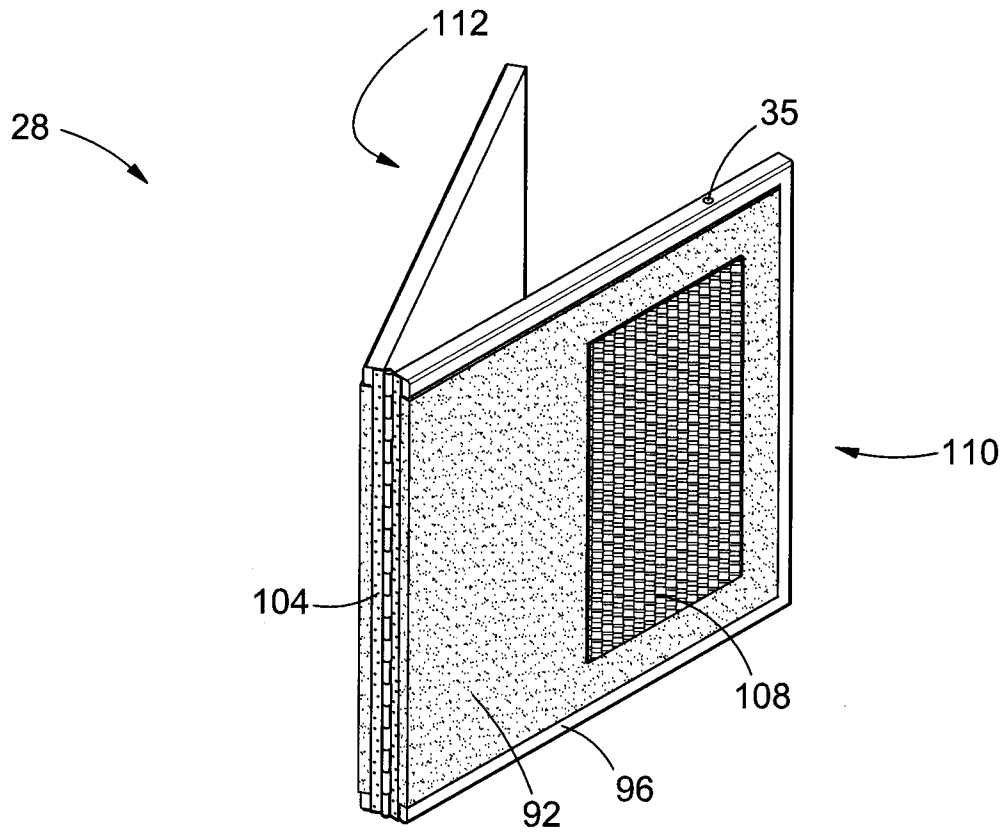


FIGURE 17

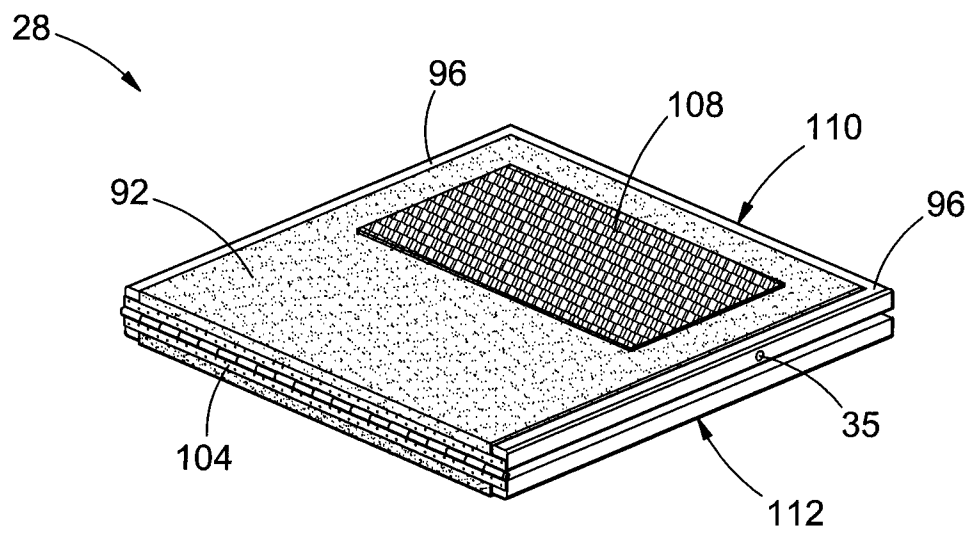


FIGURE 18