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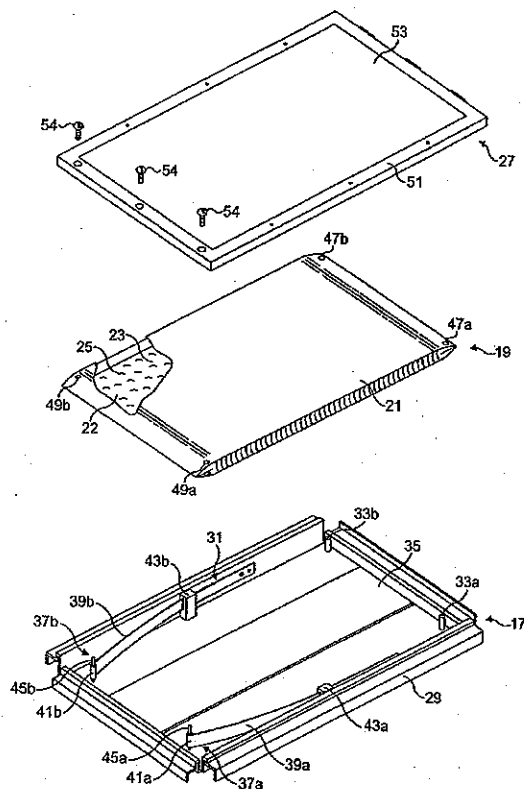
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(54) Title: GOLF DRIVING MAT



(57) Abstract: A golf driving mat, including: a flexible member (21) over which a golf ball is in use located to be hit by a head of a golf club; and a cavity (23) containing a viscous material (25) disposed beneath the flexible member, wherein the viscous material is such as to slow the head of the golf club when the head of the golf club is hit into the flexible member, such a shot representing a "fat" shot.

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GOLF DRIVING MAT

Example embodiments of the present invention relate to a golf driving mat and a golf driving mat system incorporating the same. The golf driving mat and golf driving mat system of the example embodiments are to be known as the TrueStrike™ golf driving mat and golf driving mat system.

Golf driving mats and golf driving mat systems are used at golf ranges and golf tees, in particular during the Winter. The construction of existing golf driving mats is, however, such that golfers can be given an unrealistic impression of shots struck therefrom. With existing golf driving mats, where a golfer hits a "clean" shot, that is, a correct shot, the resulting shot is the same as would be achieved on a natural ground surface, but where a golfer hits a "fat" shot, that is, where the club head hits the ground behind the golf ball, typically about 20 mm behind the golf ball, the resulting shot is often an apparently good shot, instead of what should be a poor shot, as the club head re-bounds from the surface of the mat and meets the golf ball at a reasonable angle and at only a slightly reduced speed. On the natural surface of a golf course, where a golfer hits a "fat" shot, the club head digs into the ground, to a lesser or greater extent depending upon the condition of the ground surface, causing the club head to be slowed considerably and thereby produce a poor shot. Thus, when a golfer hits a "fat" shot from existing golf driving mats, the resulting shot would often appear to be a good shot, leading the golfer to believe that the swing is good, when, in fact, the swing is poor, as the same "fat" shot on a natural ground surface would produce a poor shot, with the consequence that poor swing technique is developed.

Golf driving mats have been developed which provide a cushioning effect, for example, as disclosed in GB-A-2315024, US-A-4955611 and US-A-5273285, but these golf driving mats are still not considered adequately to provide a true impression of the strike of a golf ball from any given swing. It will also be noted that golf putting mats are known, one such mat being disclosed in DE-A-3926052.

It is an aim of the example embodiments of the present invention to provide an improved golf driving mat and golf driving mat system incorporating the same, in particular utilizing a viscous material as

an energy-absorbing medium, whereby a golfer is given a true impression of the strike of a golf ball from any given swing.

In accordance with a first aspect of the present invention, there is provided a golf driving mat, including: a flexible member formed of a ruckable material over which a golf ball is in use located to be hit by a head of a golf club; and a cavity containing a viscous material disposed beneath the flexible member, the viscous material being such as to act upon the head of the golf club when the head of the golf club is hit into the flexible member; wherein, when the head of the golf club is hit into the flexible member, the flexible member is rucked up forward of the head of the golf club, which rucking up, together with the action of the viscous material, causes the head of the golf club to be slowed.

Preferably, the flexible member may be formed of a ruckable material such that, when the head of the golf club is hit into the flexible member, the flexible member rucks up.

Preferably, the flexible member may be formed of a resilient material.

In one embodiment the flexible member may be formed of a rubberized material.

In one embodiment the viscous material may be a gel-like material.

Preferably, the gel-like material may be a gel

In another embodiment the viscous material may be a syrup.

In a further embodiment the viscous material may be a paste.

In yet another embodiment the viscous material may be a particulate material.

In a yet further embodiment the viscous material may comprise a particulate material dispersed in a carrier medium.

In one embodiment the carrier medium may be a viscous liquid.

Preferably, the viscous liquid may be an oil.

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In another embodiment the carrier medium may be a gel.

Preferably, the particulate material may comprise particles selected from at least one of the group consisting of plastic particles, metal particles and plastic-coated metal particles.

Preferably, the cavity may have a depth of up to about 20 mm.

More preferably, the cavity may have a depth of about 20 mm.

Preferably, the mat may include: a ball-receiving member located over the flexible member on which the golf ball is located.

More preferably, the ball-receiving member may be removable.

In one embodiment the ball-receiving member may be formed of a resilient material.

In another embodiment the ball-receiving member may be formed of a fabric material.

In one embodiment the ball-receiving member may have a smooth surface.

In another embodiment the ball-receiving member may have a non-smooth surface.

Preferably, the ball-receiving member may have a ribbed surface.

Preferably, the mat may comprise: a receptacle including the flexible member at an upper surface thereof and defining the cavity.

Preferably, the mat may further comprise: a body unit comprising a main body in which the receptacle is disposed.

In one embodiment the body unit may further comprise a loading mechanism for laterally inwardly loading the receptacle.

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Preferably, the loading mechanism may be adjustable such as to enable adjustment of the loading of the receptacle.

Preferably, the loading mechanism may be configured to load a forward region of the receptacle in a direction of hitting.

Preferably, the mat may further comprise: a ball-receiving unit comprising the ball-receiving member, the ball-receiving unit being attached to the main body of the body unit.

Preferably, the mat may further comprise: a flattening mechanism for flattening the flexible member of the receptacle.

In one embodiment the flattening mechanism may comprise a smoothing unit comprising a smoothing element drivable over the flexible member to flatten the same, and a drive member for driving the smoothing element.

In one embodiment the smoothing element may comprise a roller.

In another embodiment the smoothing element may comprise a blade.

In another embodiment the flattening mechanism may comprise a vibration unit for vibrating the receptacle such as to cause the viscous material to settle and thereby flatten the flexible member.

In a further embodiment the viscous material may include magnetic particles, and the flattening mechanism may comprise a magnetic field generating unit which is operable to cause the viscous material to settle and thereby flatten the flexible member.

In one embodiment the magnetic field generating unit may be operative during hitting of the golf ball such as to magnetize the magnetic particles and aggregate the same to confer a required viscosity to the viscous material, with the viscous material having a composition which is such that, in the absence of a magnetic field, the viscous material settles and thereby flattens the flexible member.

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In another embodiment the magnetic field generating unit may be operable subsequent to hitting of the golf ball such as to magnetize the magnetic particles and cause the viscous material to settle and thereby flatten the flexible member.

In yet another embodiment the flattening mechanism may comprise a tensioning unit for laterally tensioning the receptacle and thereby flattening the flexible member.

In one embodiment the tensioning unit may comprise first and second spreader bars attached to respective sides of the receptacle, and a plurality of resilient elements for biasing the spreader bars outwardly such as to tension the receptacle.

In one embodiment the spreader bars may extend over substantially a full height of the respective sides of the receptacle

In another embodiment the spreader bars may be attached to upper ends of the respective sides of the receptacle.

In another embodiment the tensioning unit may be operable by a golfer to apply an increased tensioning force to the receptacle.

Preferably, the tensioning unit may comprise first and second spreader bars attached to respective sides of the receptacle, and a biasing element operable by the golfer to bias the spreader bars outwardly such as to tension the receptacle.

In one embodiment the biasing element may comprise a leaf spring coupled between the spreader bars.

In a second aspect of the present invention, there is provided a golf driving mat system, comprising: a base unit on which a golfer stands to hit a golf shot; and the above-described mat provided to the base unit.

In one embodiment the mat may be removable.

In one embodiment the base unit may include a recess in which the mat is in use located.

In another embodiment the base unit may comprise a base including first and second recesses in one of which the mat is in use located according to whether the golfer is a left-handed or right-handed golfer, and a sheet located on the base including an aperture through which the mat is presented.

In another embodiment the mat may be integrally formed with the base unit

The golf driving mat of the example embodiments provides a true impression of the strike of a golf ball by utilizing a viscous material to effect the speed and position of the club head in the manner as would occur if the shot were made on the natural surface of a golf course. The golf driving mat may be configured such as to slow the club head through the golf ball where the swing path of the club head is one which would produce a "fat" shot.

Preferred embodiments of the present invention will now be described herein below by way of example only with reference to the accompanying drawings, in which:

Figure 1 illustrates a perspective view of a golf driving mat system including a golf driving mat in accordance with a first embodiment of the present invention;

Figure 2 illustrates the base of the base unit of the golf driving mat of Figure 1;

Figure 3 illustrates the sheet of the base unit of the golf driving mat of Figure 1;

Figure 4 illustrates a first exploded perspective view of the golf driving mat of Figure 1;

Figure 5 illustrates a second exploded perspective view of the golf driving mat of Figure 1;

Figure 6 illustrates a fragmentary vertical sectional view through the golf driving mat of Figure 1 where a golfer makes a "clean" strike of a golf ball resting thereon;

Figure 7 illustrates a fragmentary vertical sectional view through the golf driving mat of Figure 1 where a golfer makes a "fat" strike of a golf ball resting thereon;

- 5 Figure 8 illustrates a perspective view of a golf driving mat in accordance with a second embodiment of the present invention, illustrated with the smoothing unit in the inoperative configuration;

Figure 9 illustrates a perspective view of the golf driving mat of Figure 8, with the
10 smoothing unit in operation;

Figure 10 illustrates a perspective view of a golf driving mat in accordance with a third embodiment of the present invention;

- 15 Figure 11 illustrates a perspective view of a golf driving mat in accordance with a fourth embodiment of the present invention;

Figure 12 illustrates a first exploded perspective view of a golf driving mat in accordance with a fifth embodiment of the present invention;

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Figure 13 illustrates a second exploded perspective view of the golf driving mat of Figure 12;

Figure 14 illustrates a first exploded perspective view of a golf driving mat in accordance with a sixth embodiment of the present invention; and
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Figure 15 illustrates a second exploded perspective view of the golf driving mat of Figure 14.

- 30 Figures 1 to 5 illustrate a golf driving mat system including a golf driving mat in accordance with a first embodiment of the present invention.

The golf driving mat system comprises a base unit 1 on which a golfer stands to hit a golf shot, and a golf driving mat 3 which is mounted in the base unit 1 and from which golf balls are struck by a golfer.

- 5 The base unit 1 comprises a base 5 which is located on a ground surface, and a sheet 7 which is located on the base 5 and on which a golfer stands to hit golf shots. In this embodiment the base 5 includes first and second mat recesses 9a, 9b located at respective sides thereof in which the golf driving mat 3 is selectively disposed, and a sheet recess 11 in which the sheet 7 is located, and the sheet 7 includes a clearance
- 10 aperture 15 through which the golf driving mat 3 is presented, with the sheet 7 being locatable in the sheet recess 11 in one of two positions such that the clearance aperture 15 therein overlies one of the first and second mat recesses 9a, 9b. With this configuration, the golf driving mat system can be easily configured for both left-handed and right-handed golfers, with the golf driving mat 3 being located in the first mat recess
- 15 9a for use by a left-handed golfer and the second mat recess 9b for use by a right-handed golfer, and the sheet 7 being disposed such that the clearance aperture 15 therein overlies the respective one of the first and second mat recesses 9a, 9b.

- The golf driving mat 3 comprises a body unit 17, a receptacle 19 which is disposed
- 20 within the body unit 17 and includes an upper, flexible member 21, a lower member 22 and a cavity 23, filled with a viscous material 25, therebetween, and an upper, ball-receiving unit 27 disposed over the flexible member 21 of the receptacle 19.

- The body unit 17 comprises a main body 29 within which the receptacle 19 is disposed,
- 25 and a loading mechanism 31 for laterally loading the receptacle 19, in this embodiment at the forward end in the direction of hitting, such as to configure the receptacle 19 to simulate different ground conditions, for example, from firm to heavy turfed ground, and even sand bunkers.

- 30 The main body 29 includes first and second anchor pins 33a, 33b at one, the rear, end thereof in the direction of hitting to which the receptacle 19 is fixed such as to prevent movement of the receptacle 19 forwardly on hitting golf balls from the golf driving mat 3.

The main body 29 further includes an impact element 35 which extends along the lower surface thereof in the direction of hitting, which impact element 35 acts to provide an impact surface such that, should a golfer hit down through the receptacle 19, the golf club re-bounds from the impact element 35 without any significant jarring. In this embodiment the impact element 35 is formed of a rubberised material, preferably a rubber.

The loading mechanism 31 comprises first and second loading units 37a, 37b, in this embodiment adjustable units for providing for adjustment of the loading, which are disposed to respective sides of the main body 29.

Each of the loading units 37a, 37b comprises a resilient element 39a, 39b, in this embodiment a resilient strip, preferably of spring steel, which is attached at the rearward end in the direction of hitting to the main body 29 and includes a pin holder 41a, 41b at the forward end, an adjuster 43a, 43b which is slideable along the respective resilient element 39a, 39b such as to provide for adjustment of the inward deflection of the respective resilient element 39a, 39b and hence the loading provided by the respective resilient element 39a, 39b, and an anchor pin 45a, 45b which is located in the pin holder 41a, 41b of the respective resilient element 39a, 39b and attached to a respective one of the sides of the receptacle 19, in this embodiment at a forward end of the receptacle 19.

The receptacle 19, in this embodiment an enclosed, flexible bag, is a planar rectangular member having a predetermined depth, in this embodiment of about 20 mm, such that, where filled with viscous material 25, the upper, flexible member 21 of the receptacle 19 simulates a ground surface, typically a turfed ground surface. In this embodiment the receptacle 19 is fabricated from a ruckable material, such that, when a golfer hits a "fat" shot, the flexible member 21 is rucked up, which rucking up, together with the action of the underlying viscous material 25, causes the speed of the club head to be slowed in the same manner as when hitting a "fat" shot on a turfed ground surface.

In one embodiment the receptacle 19 is formed of a synthetic material, preferably polyvinyl chloride (PVC). In another embodiment the receptacle 19 can be formed of a

rubberised material, preferably a rubber, and more preferably a synthetic rubber. In a preferred embodiment the receptacle 19 is formed of a resilient material.

5 The receptacle 19 includes first and second rear apertures 47a, 47b at the rear end thereof in which the anchor pins 33a, 33b on the main body 29 are located to fix the position of the receptacle 19 in the main body 29, and first and second forward apertures 49a, 49b at the forward end thereof in which the anchor pins 45a, 45b of the loading units 37a, 37b are located such as to fix the lateral and forward positions of the respective sides of the receptacle 19.

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In this embodiment the viscous material 25 is a gel, for example, an aqueous gel. In one preferred embodiment the gel comprises a petroleum jelly. In an alternative embodiment the viscous material 25 could be a syrup, such as a corn syrup. In another alternative embodiment the viscous material 25 could be a paste. In a further alternative
15 embodiment the viscous material 25 could comprise a particulate material in a carrier medium, for example, a gel or an oil, such as a silicone oil. In yet another alternative embodiment the viscous material 25 could be a particulate material. Examples of particulate materials include plastic particles, metal particles and plastic-coated metal particles.

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The ball-receiving unit 27 comprises a frame 51 which is removably attached, in this embodiment by screws 54, to the main body 29 of the body unit 17, and a ball-receiving member 53 which is attached to the frame 51 and on which golf balls to be hit are located. In being removable, the ball-receiving unit 27 allows for replacement when
25 damaged, typically through wear.

In this embodiment the upper surface of the ball-receiving member 53 is a smooth surface. In an alternative embodiment the upper surface of the ball-receiving member 53 can be a non-smooth surface, for example, a roughened or ribbed surface.

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In this embodiment the ball-receiving member 53 comprises a resilient material, typically a fabric material containing Lycra®, for example Cordura® as available from E.I. du Pont de Nemours and Company, Wilmington, US.

With this construction, when a golfer makes a good swing and hits a golf ball with a "clean" strike, the golf driving mat 3 reacts in the same manner as would a natural ground surface, as illustrated in Figure 6. However, when a golfer makes a poor swing which is such as to cause the club head to hit the ball-receiving member 53 of the ball-receiving unit 27 behind the golf ball, and hence the flexible member 21 of the receptacle 19, that is, hits the shot "fat", the flexible member 21, under the reaction of the viscous material 25, acts to cause the club head to dig into the golf driving mat 3, which causes the club head to be slowed down and make little or no contact with the golf ball, as illustrated in Figure 7.

By altering the thickness of the flexible member 21 of the receptacle 19 and the ball-receiving member 53 and the viscosity of the viscous material 25, the golf driving mat 3 can be configured to simulate different ground conditions, from firm to heavy turfed ground, and even sand bunkers. In this embodiment, a golfer is able to select between a plurality of different golf driving mats 3 which are representative of different ground conditions.

Figures 8 and 9 illustrate a golf driving mat in accordance with a second embodiment of the present invention.

The golf driving mat 3 of this embodiment is a modification of the above-described first embodiment, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail, with like parts being designated by like reference signs.

The golf driving mat 3 of this embodiment differs from that of the above-described first embodiment in comprising a flattening mechanism for flattening the flexible member 21 of the receptacle 19 after hitting golf balls therefrom. The present inventor has found that when golf balls are hit from the golf driving mat 3, and particularly after repeatedly hitting "fat" golf shots in succession, the flexible member 21 of the receptacle 19 can become so uneven as to prevent the positioning of a golf ball thereon, and hence the proper operation of the golf driving mat 3. Thus, means for flattening the flexible

member 21 of the receptacle 19 is required in order to prevent a golfer having manually to flatten the flexible member 21, typically with the palm of the hand.

5 In this embodiment the flattening mechanism comprises a smoothing unit 59 which is actuatable by a golfer to flatten the flexible member 21 of the receptacle 19 by acting on the ball-receiving member 53 of the ball-receiving unit 27.

10 In this embodiment the smoothing unit 59 comprises a smoothing element 61 which is driveable over the flexible member 21 of the receptacle 19 to flatten the same, and a drive member 63 for reciprocally driving the smoothing element 61 over the ball-receiving member 53 of the ball-receiving unit 27 and hence the flexible member 21. Figure 9 illustrates the smoothing element 61 where part driven across the flexible member 21 of the receptacle 19. In this embodiment the smoothing element 61 comprises a roller. In another embodiment the smoothing element 61 could comprise a
15 blade, such as a flexible wiper blade. In this embodiment the drive member 63 is electrically operated.

Figure 10 illustrates a golf driving mat in accordance with a third embodiment of the present invention.

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The golf driving mat 3 of this embodiment is a modification of the above-described first embodiment, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail, with like parts being designated by like reference signs.

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The golf driving mat 3 of this embodiment differs from that of the above-described first embodiment in comprising a flattening mechanism for flattening the flexible member 21 of the receptacle 19 after hitting golf balls therefrom. The present inventor has found that when golf balls are hit from the golf driving mat 3, and particularly after repeatedly
30 hitting "fat" golf shots in succession, the flexible member 21 of the receptacle 19 can be become so uneven as to prevent the positioning of a golf ball thereon, and hence the proper operation of the golf driving mat 3. Thus, means for flattening the flexible

member 21 of the receptacle 19 is required in order to prevent a golfer having manually to flatten the flexible member 21, typically with the palm of the hand.

5 In this embodiment the flattening mechanism comprises a vibration unit 65, here disposed beneath the main body 29 of the body unit 17, which is operable to vibrate the receptacle 19, and hence the filled viscous material 25, which vibration acts to cause the viscous material 25 to settle and thereby flatten the flexible member 21 of the receptacle 19.

10 In this embodiment the vibration unit 65 comprises a plurality of ultrasonic transducers which are attached to the main body 29 of the body unit 17.

Figure 11 illustrates a golf driving mat in accordance with a fourth embodiment of the present invention.

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The golf driving mat 3 of this embodiment is a modification of the above-described first embodiment, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail, with like parts being designated by like reference signs.

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The golf driving mat 3 of this embodiment differs from that of the above-described first embodiment in comprising a flattening mechanism for flattening the flexible member 21 of the receptacle 19 after hitting golf balls therefrom. The present inventor has found that when golf balls are hit from the golf driving mat 3, and particularly after repeatedly hitting "fat" golf shots in succession, the flexible member 21 of the receptacle 19 can be become so uneven as to prevent the positioning of a golf ball thereon, and hence the proper operation of the golf driving mat 3. Thus, means for flattening the flexible member 21 of the receptacle 19 is required in order to prevent a golfer having manually to flatten the flexible member 21, typically with the palm of the hand.

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In this embodiment the viscous material 25 includes magnetic particles, and the flattening mechanism comprises a magnetic field generating unit 67, here disposed to the main body 29 of the body unit 17 beneath the lower member 22 of the receptacle 19,

which is operable to attract the magnetic particles of the viscous material 25 towards the lower member 22 of the receptacle 19, which magnetization is utilized to cause the viscous material 25 to settle and thereby flatten the flexible member 21 of the receptacle 19. In one embodiment the magnetic particles comprise metal particles. In another
5 embodiment the magnetic particles comprise plastic-coated metal particles. In preferred embodiments the particles have a diameter of less than about 1 mm.

In one mode of operation, the magnetic field generating unit 67 is operative during the hitting stroke such as to magnetize the magnetic particles and thereby effectively
10 aggregate the magnetic particles to confer the required viscosity to the viscous material 25, with the composition of the viscous material 25 being such that, in the absence of a magnetic field, the viscous material 25 settles and thereby flattens the flexible member 21 of the receptacle 19.

15 In another mode of operation, the magnetic field generating unit 67 is operated subsequent to the hitting stroke such as to attract the magnetic particles of the viscous material 25 towards the lower member 22 of the receptacle 19, which magnetization acts to cause the viscous material 25 to settle and thereby flatten the flexible member 21 of the receptacle 19.

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Figures 12 and 13 illustrate a golf driving mat in accordance with a fifth embodiment of the present invention.

25 **The golf driving mat 3 of this embodiment is a modification of the above-described first embodiment, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail, with like parts being designated by like reference signs.**

30 The golf driving mat 3 of this embodiment differs from that of the above-described first embodiment in omitting the loading mechanism 31, with the anchor pins 45a, 45b being provided to the other, forward, end of the main body 29 of the body unit 17, and in further comprising a flattening mechanism for flattening the flexible member 21 of the receptacle 19 after hitting golf balls therefrom. The present inventor has found that

when golf balls are hit from the golf driving mat 3, and particularly after repeatedly hitting "fat" golf shots in succession, the flexible member 21 of the receptacle 19 can become so uneven as to prevent the positioning of a golf ball thereon, and hence the proper operation of the golf driving mat 3. Thus, means for flattening the flexible member 21 of the receptacle 19 is required in order to prevent a golfer having manually to flatten the flexible member 21, typically with the palm of the hand.

In this embodiment the flattening mechanism comprises a tensioning unit 69 for laterally tensioning the respective sides of the receptacle 19 in opposed directions. In this embodiment the tensioning unit 69 comprises first and second spreader bars 71a, 71b which are attached to the respective sides of the receptacle 19, here over substantially the full height of the sides of the receptacle 19, and a plurality of resilient elements 73, here tension springs, for outwardly biasing the respective sides of the receptacle 19. With this configuration, the body of the receptacle 19, including the flexible member 21 of the receptacle 19, is tensioned by the tensioning unit 69 such that, subsequent to the hitting of a "fat" shot from the golf driving mat 3, which is such as to hit into the receptacle 19, the tensioning force acts to flatten the flexible member 21 of the receptacle 19.

In an alternative embodiment the spreader bars 71a, 71b could be attached to points along the respective sides of the receptacle 19, typically to the upper ends of the respective sides or the mid-points of the respective sides.

Figures 14 and 15 illustrate a golf driving mat in accordance with a sixth embodiment of the present invention.

The golf driving mat 3 of this embodiment is a modification of the above-described first embodiment, and thus, in order to avoid unnecessary duplication of description, only the differences will be described in detail, with like parts being designated by like reference signs.

The golf driving mat 3 of this embodiment differs from that of the above-described first embodiment in omitting the loading mechanism 31, with the anchor pins 45a, 45b being

provided to the other, forward, end of the main body 29 of the body unit 17, and in further comprising a flattening mechanism for flattening the flexible member 21 of the receptacle 19 after hitting golf balls therefrom. The present inventor has found that when golf balls are hit from the golf driving mat 3, and particularly after repeatedly hitting "fat" golf shots in succession, the flexible member 21 of the receptacle 19 can become so uneven as to prevent the positioning of a golf ball thereon, and hence the proper operation of the golf driving mat 3. Thus, means for flattening the flexible member 21 of the receptacle 19 is required in order to prevent a golfer having manually to flatten the flexible member 21, typically with the palm of the hand.

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In this embodiment the flattening mechanism comprises a tensioning unit 75 for laterally tensioning the respective sides of the receptacle 19 in opposed directions with a flattening force on actuation by a golfer. In this embodiment the tensioning unit 75 comprises first and second spreader bars 77a, 77b which are attached to the respective sides of the receptacle 19, here over substantially the full height of the sides of the receptacle 19, and hinged at one, the rearward, end about a pivot 79, and a biasing element 81, in this embodiment a leaf spring, for normally outwardly biasing the first and second spreader bars 77a, 77b, and hence the respective sides of the receptacle 19, with a first tensioning force, and being operable by a golfer, in this embodiment manually by the golfer stepping thereon, to apply a second, higher tensioning force, as a flattening force, to the receptacle 19. With this configuration, the body of the receptacle 19, including the flexible member 21 of the receptacle 19, is normally under the light tension of the first tensioning force, and, on a golfer manually operating the biasing element 81, in this embodiment by stepping thereon, the biasing element 81 applies the higher, second tensioning force to the spreader bars 77a, 77b which is such as flatten the flexible member 21 of the receptacle 19. On the golfer releasing the biasing element 81, in this embodiment by stepping thereoff, the biasing element 81 returns to applying the light, first tensioning force to the receptacle 19.

30 In an alternative embodiment the spreader bars 77a, 77b could be attached to points along the respective sides of the receptacle 19, typically to the upper ends of the respective sides or the mid-points of the respective sides.

Finally, it will be understood that the present invention has been described in its preferred embodiments and can be modified in many different ways without departing from the scope of the invention as defined by the appended claims.

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CLAIMS

1. A golf driving mat, including:
a flexible member formed of a ruckable material over which a golf ball is in use
5 located to be hit by a head of a golf club; and
a cavity containing a viscous material disposed beneath the flexible member, the
viscous material being such as to act upon the head of the golf club when the
head of the golf club is hit into the flexible member;
wherein, when the head of the golf club is hit into the flexible member, the
10 flexible member is rucked up forward of the head of the golf club, which rucking
up, together with the action of the viscous material, causes the head of the golf
club to be slowed.
2. The mat of claim 1, wherein the flexible member is formed of a resilient
15 material.
3. The mat of claim 1 or 2, wherein the flexible member is formed of a rubberised
material.
- 20 4. The mat of any of claims 1 to 3, wherein the viscous material is a gel-like
material.
5. The mat of claim 4, wherein the gel-like material is a gel.
- 25 6. The mat of any of claims 1 to 3, wherein the viscous material is a syrup.
7. The mat of any of claims 1 to 3, wherein the viscous material is a paste.
8. The mat of any of claims 1 to 3, wherein the viscous material is a particulate
30 material.
9. The mat of any of claims 1 to 3, wherein the viscous material comprises a
particulate material dispersed in a carrier medium.

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10. The mat of claim 9, wherein the carrier medium is a viscous liquid.
11. The mat of claim 10, wherein the viscous liquid is an oil.
- 5 12. The mat of claim 9, wherein the carrier medium is a gel.
13. The mat of any of claims 8 to 12, wherein the particulate material comprises particles selected from at least one of the group consisting of plastic particles, metal particles and plastic-coated metal particles.
- 10 14. The mat of any of claims 1 to 13, wherein the cavity has a depth of up to about 20 mm.
- 15 15. The mat of any of claims 1 to 13, wherein the cavity has a depth of about 20 mm.
16. The mat of any of claims 1 to 15, including:
a ball-receiving member located over the flexible member on which the golf ball is located.
- 20 17. The mat of claim 16, wherein the ball-receiving member is removable.
18. The mat of claim 16 or 17, wherein the ball-receiving member is formed of a resilient material.
- 25 19. The mat of any of claims 16 to 18, wherein the ball-receiving member is formed of a fabric material.
20. The mat of any of claims 16 to 19, wherein the ball-receiving member has a smooth surface.
- 30 21. The mat of any of claims 16 to 19, wherein the ball-receiving member has a non-smooth surface.

22. The mat of claim 21, wherein the ball-receiving member has a ribbed surface.
23. The mat of any of claims 1 to 22, comprising:
5 a receptacle including the flexible member at an upper surface thereof and defining the cavity.
24. The mat of claim 23, further comprising:
a body unit comprising a main body in which the receptacle is disposed.
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25. The mat of claim 24, wherein the body unit further comprises a loading mechanism for laterally inwardly loading the receptacle.
26. The mat of claim 25, wherein the loading mechanism is adjustable such as to
15 enable adjustment of the loading of the receptacle.
27. The mat of claim 25 or 26, wherein the loading mechanism is configured to load a forward region of the receptacle in a direction of hitting.
- 20 28. The mat of any of claims 24 to 27 when appendant upon any of claims 16 to 22, further comprising:
a ball-receiving unit comprising the ball-receiving member, the ball-receiving unit being attached to the main body of the body unit.
- 25 29. The mat of any of claims 23 to 28, further comprising:
a flattening mechanism for flattening the flexible member of the receptacle.
30. The mat of claim 29, wherein the flattening mechanism comprises a smoothing unit comprising a smoothing element drivable over the flexible member of the
30 receptacle to flatten the same, and a drive member for driving the smoothing element.
31. The mat of claim 30, wherein the smoothing element comprises a roller.

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32. The mat of claim 30, wherein the smoothing element comprises a blade.
- 5 33. The mat of claim 29, wherein the flattening mechanism comprises a vibration unit for vibrating the receptacle such as to cause the viscous material to settle and thereby flatten the flexible member.
- 10 34. The mat of claim 29, wherein the viscous material includes magnetic particles, and the flattening mechanism comprises a magnetic field generating unit which is operable to cause the viscous material to settle and thereby flatten the flexible member.
- 15 35. The mat of claim 34, wherein the magnetic field generating unit is operative during hitting of the golf ball such as to magnetize the magnetic particles and aggregate the same to confer a required viscosity to the viscous material, with the viscous material having a composition which is such that, in the absence of a magnetic field, the viscous material settles and thereby flattens the flexible member.
- 20 36. The mat of claim 34, wherein the magnetic field generating unit is operable subsequent to hitting of the golf ball such as to magnetize the magnetic particles and cause the viscous material to settle and thereby flatten the flexible member.
- 25 37. The mat of claim 29, wherein the flattening mechanism comprises a tensioning unit for laterally tensioning the receptacle and thereby flattening the flexible member.
- 30 38. The mat of claim 37, wherein the tensioning unit comprises first and second spreader bars attached to respective sides of the receptacle, and a plurality of resilient elements for biasing the spreader bars outwardly such as to tension the receptacle.

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39. The mat of claim 38, wherein the spreader bars extend over substantially a full height of the respective sides of the receptacle.
- 5 40. The mat of claim 38, wherein the spreader bars are attached to upper ends of the respective sides of the receptacle.
41. The mat of claim 37, wherein the tensioning unit is operable by a golfer to apply an increased tensioning force to the receptacle.
- 10 42. The mat of claim 41, wherein the tensioning unit comprises first and second spreader bars attached to respective sides of the receptacle, and a biasing element operable by the golfer to bias the spreader bars outwardly such as to tension the receptacle.
- 15 43. The mat of claim 42, wherein the biasing element comprises a leaf spring coupled between the spreader bars.
44. A golf driving mat system, comprising:
a base unit on which a golfer stands to hit a golf shot; and
20 the mat of any of claims 1 to 43 provided to the base unit.
45. The mat system of claim 44, wherein the mat is removable.
46. The mat system of claim 45, wherein the base unit includes a recess in which the
25 mat is in use located.
47. The mat system of claim 45, wherein the base unit comprises a base including first and second recesses in one of which the mat is in use located according to whether the golfer is a left-handed or right-handed golfer, and a sheet located on
30 the base including an aperture through which the mat is presented.
48. The mat system of claim 44, wherein the mat is integrally formed with the base unit.