

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

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
20 February 2003 (20.02.2003)

PCT

(10) International Publication Number
WO 03/013667 A2

(51) International Patent Classification⁷: **A63B 69/36**

(21) International Application Number: PCT/GB02/03622

(22) International Filing Date: 6 August 2002 (06.08.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0119089.1 6 August 2001 (06.08.2001) GB

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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, 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, OM, PH, PL, PT, RO, RU, SD, SE, SG,
SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,
VN, YU, ZA, ZM, ZW.

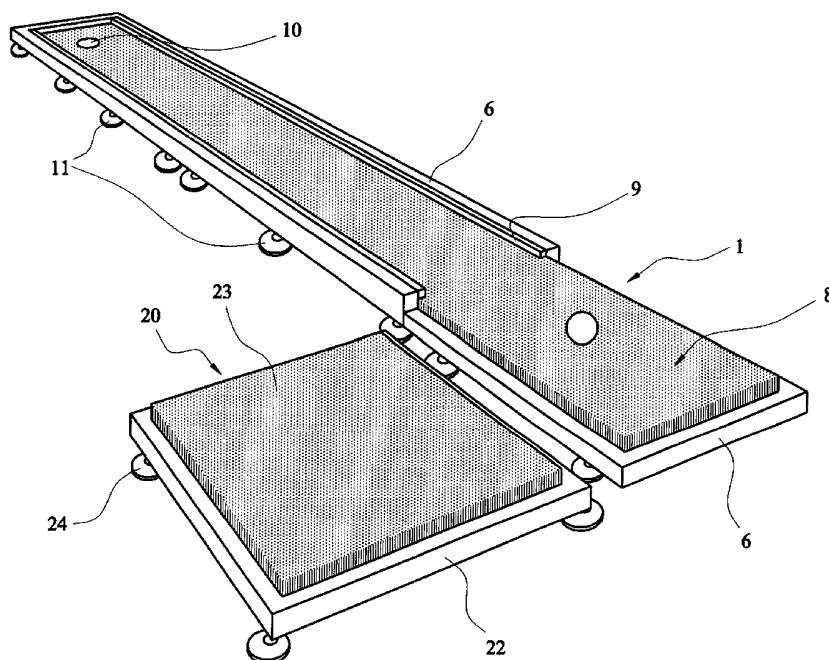
(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI,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

Published:

— without international search report and to be republished
upon receipt of that report

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

(54) Title: IMPROVEMENTS IN OR RELATING TO THE GAME OF GOLF



(57) Abstract: A practice putting green comprises a planar member (2) formed of slate or the like. A layer (8) of simulated grass is located on the surface of the planar member and includes an aperture adjacent one end to receive the ball. The planar member (2) is supported in a horizontal disposition by, for example, a plurality of adjustable feet (11).



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Improvements in or relating to the game of golf

This invention relates to the game of golf and is concerned with a device to assist golfers in striking the ball correctly.

When hitting a golf ball, the stance of the player and the manner in which the player approaches the ball are of the utmost importance. However, even if the player adopts the appropriate stance and approach, the ball will not necessarily move in the required direction and at the required speed because of irregularities in the surface of the green over which the ball has to travel. Thus it is difficult for the player to deduce, from the movement of the ball, that the stance and approach he has adopted was correct.

Existing practice putting systems comprise bases made out of a plastics material or a metal which is covered by some form of fabric covering. GB-A-2224450 discloses a putting practice device having a base made of styrofoam or some other relatively light material. The putting surface is covered by a fabric covering such as an outdoor carpet with the fibres bound to the base. The putting practice unit of GB-A-2121297 has a putting surface made of two sections which can be pivoted relative to one another. The putting unit has a base made of expanded polystyrene which is covered by a nylon-based artificial grass surface. In contrast, the putting system of US-A-5445381 has a putting green and base made of extruded aluminium planks. The putting system has four corner adjusters which can be used to level the surface or arranged such that the putting surface has some "break". When the adjusters are arranged at different heights the weight of the system twists the aluminium planks.

However, the putting surfaces discussed above all suffer from the problem that even when the surface is arranged to be as flat as possible the nature of the materials from which it is cause the ball to be deflected to a certain degree from the path in which it was struck. For example, bases made from plastics materials may warp or stretch under imposed loads or after exposure to heat. The performance of some plastics materials also degrades upon long-term exposure to the UV rays present in natural sunlight. Putting surfaces having bases made from metals such as aluminium also suffer from the fact that such materials expand and contract quite readily in response to temperature fluctuations. Thus, when a golfer strikes a putt across putting surfaces such those

described he cannot be sure whether the trajectory of the ball results solely from his positioning, stance and technique or if the surface has had some effect.

It is an object of the invention to provide a device which will substantially eliminate these irregularities so that the direction and speed of the ball, when struck, more accurately reflects the correctness of the stance and approach adopted by the player when striking the ball.

According to the present invention, a practice putting green comprises a planar member having a smooth surface, said member being formed of slate or like material having a surface of similar smoothness to slate, a simulated grass layer superposed on said smooth surface, an aperture extending through said layer to receive the ball, and a means of supporting the planar member so that said surface is horizontal.

In preferred embodiments, the aperture is entirely surrounded by the simulated grass layer. Preferably, the aperture is located on the central longitudinal axis of the planar member. In preferred embodiments, the aperture is located off-axis with respect to the central longitudinal axis of the planar member.

The average surface smoothness is taken to be the range of heights between all of the points on the surface of a material. Preferably, the average surface smoothness of the planar member is between 0 μm and 2000 μm . In other embodiments, the average surface smoothness of the planar member is between 0 μm and 1500 μm . Conveniently, the average surface smoothness of the planar member is between 0 μm and 1000 μm . In preferred embodiments, the average surface smoothness of the planar member is between 0 μm and 500 μm .

It is particularly preferred for the planar member to be formed of slate because it has a sufficiently smooth surface and is relatively inexpensive. Slate can be machined relatively easily to have a surface smooth enough to ensure the true running of a golf ball putted across a surface made of it. The price of slate and the small amount of machining required to produce a smooth surface make slate a cost-effective option for a putting surface. However, other materials of similar surface smoothness, such as marble, can be used.

In preferred embodiments, the planar member is made from a material having a coefficient of thermal expansion of around 1×10^{-6} per $^{\circ}\text{C}$ to 50×10^{-6} per $^{\circ}\text{C}$. Conveniently, the planar member is made from a material having a coefficient of thermal expansion of around 5×10^{-6} per $^{\circ}\text{C}$ to 25×10^{-6} per $^{\circ}\text{C}$. In other embodiments, the planar member may be made from a material having a coefficient of thermal expansion of around 8×10^{-6} per $^{\circ}\text{C}$ to 15×10^{-6} per $^{\circ}\text{C}$. Most preferably, the planar member is made from a material having a coefficient of thermal expansion of around 9×10^{-6} per $^{\circ}\text{C}$ to 11×10^{-6} per $^{\circ}\text{C}$. A planar member made from a material having a relatively low coefficient of thermal expansion will not deform under extremes of temperature. Thus, the surface of the planar member will not deform or warp appreciably even under extremes of temperature. This enables a putting green incorporating a planar member made of such a material to be used both indoors and outdoors in all types of climate.

The planar member may be made from a material having a density of substantially 2500 to 3000 kg/m^3 . In preferred embodiments, the planar member is made from a material having a density of substantially 2600 to 2900 kg/m^3 .

The planar member may be made from a material having a tensile strength of around 50 to 70 Nmm^{-2} . In preferred embodiments, the planar member may be made from a material having a compressive strength of around 180 to 250 Nmm^{-2} . Preferably, the planar member is made from a material having a modulus of around 50 to 150 Nmm^{-2} .

In preferred embodiments, the planar member has a thickness of between 0.5 and 10 cm. Preferably, the planar member has a thickness of between 1 cm and 5 cm. Most preferably, the planar member has a thickness of substantially 2 cm. The thicker the planar member is the greater is the tendency for the member to stay flat.

Preferably, the planar member has a longitudinal length of between 0.5 m and 2.0 m. Most preferably, the planar member has a longitudinal length of substantially 1.0 m. In preferred embodiments, the planar member has a lateral width of between 20 cm and 50 cm. Preferably, the planar member has a lateral width of around 30 cm.

The simulated grass may be in the form of a backing material to which fibres are attached so that they are generally perpendicular to the backing material. The fibres are preferably formed of synthetic plastics material and are flexible rather than rigid so as not to interfere with the true running of the ball. An example of simulated grass of this type is a synthetic sports surface known as Match-Winner and available from Play - Rite Ltd. of Liversedge, West Yorkshire, UK. This is a vertical loop, structured, scrim reinforced needle punch material having a backing thickness of 4.0mm and a polypropylene pile of thickness 11.0 mm. Another material which may be used is that known under the Trade Mark Astro turf.

In another embodiment the simulated grass may be in the form of a bowling carpet. A suitable material of this type is 7.00 mm thick felt available from Le Feutre S.A. in France. This includes a backing material formed of a wool/polyester/viscose mixture and a playing surface formed of wool. If desired, green baize such as is used on billiard tables may be used as the simulated grass. However in this case, the speed of the ball will generally be much greater than when rolling over the turf of a natural putting green and this is less desirable.

In an embodiment, the planar member is mounted in a frame of, for example, a metal such as aluminium and the means for supporting the member is in the form of feet depending from the frame and of adjustable length.

Preferably, the practice putting green is associated with a platform having an upper surface substantially coplanar with the surface of the planar member and on which the player can stand. It is preferred that the platform should not be attached to the practice putting green so that any movement of the platform as the player stops on and off it is not transmitted to the planar member and hence the horizontal disposition of the planar member is not disturbed.

In use of the practice putting green, the player stands adjacent to one end of the green, preferably on the standing platform if provided, places a golf ball on the green and hits the ball towards the aperture adopting what he/she believes to be the appropriate stance and approach. Because of the smoothness of the planar member, the ball will run true and, if struck correctly, will enter the aperture. Thus the player instantly knows whether or not his/her stance and approach was correct

and, if they are not, and consequently the ball has not entered the aperture, the player can try again with an altered stance and/or approach.

It is preferred for the practice putting green to include a means of returning the ball, after it has passed through the aperture, back towards where the player stands.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a perspective view of a practice putting green in combination with a standing platform in accordance with the invention;

Figure 2 is a plan view of the practice green of Figure 1;

Figure 3 is a cross-section through the practice putting green of Figure 2 along line III - III;

Figure 4 is a cross-section through the practice putting green of Figure 2 along the line IV-IV;

Figure 5 is a plan view of the standing platform of Figure 1,

Figure 6 is a cross-section through the standing platform of Figure 5 along the line VI-VI;

Figure 7 is a cross-section through the practice putting green of Figure 3 showing a modified frame; and

Figure 8 shows a further modified frame;

Figure 9A shows a plan view of an of a planar member for use with the frames in Figures 7 and 8;

Figure 9B shows a cross-section along the line VII-VII in Figure 9A;

Figure 10A shows a plan view of an of a planar member for use with the frames in Figures 7 and 8; and

Figure 10B shows a cross-sectional view of the planar member in Figure 10A.

Referring now to Figures 1 to 4, there is shown a practice putting green 1 comprising a planar member 2 formed of two pieces of slate fitted together end to end (only one of the pieces is shown in Figure 2). Each piece of slate has a length of about 1.8m and a width of about 0.4m. The use of more than one piece of slate in this way facilitates transport of the slate and installation and erection of the practice putting green. A plurality of holes 3 is drilled at intervals along the lateral edges of each sheet. Also a plurality of U-shaped slots 4 is provided at the lateral edges of each sheet inbetween the holes 3.

One of the pieces of slate includes an aperture 5 on its centre line at a distance of about 265 mm from its end most remote from the other piece of slate. The planar member 2 sits in a frame 6 formed from aluminium channel section and arranged around the periphery of the planar member. The planar member is secured to the frame by fixing bolts 7 passing through the holes 3.

A layer 8 of simulated grass (such as Match-Winner) is located on the upper surface of the planar member 2 and is held in position by a resilient cushion 9 formed of rubber or the like fitted to the frame 6. The simulated grass layer 8 has an aperture in registry with the aperture 5 in the slate and a cup 10 of plastics material is fitted into the apertures.

A plurality of adjustable levelling feet 11 is provided. Each of these feet 11 comprises a threaded shank 12 terminating at one end in a base portion 13 for engaging with the floor. A nut 14 is threadingly engaged with the shank 12 and supports a sleeve 15 on the shank. The sleeve has an abutment in the form of a flange 16 at its lower end. The sleeve 15 has an external dimension such that it will fit through a hole provided in the frame 6, in registry with one of the slots 4, and the underside of the frame 6 will sit on the flange 16. The sleeve 15 can be caused to traverse along the shank 12 by rotating the nut 14 thereby effectively altering the length between the base portion 13 and the flange 16.

If desired, the cup 10 can be replaced by an open-ended sleeve (not shown) in which case a ball return chute 17 (see Figure 4) may be provided under the planar member 2 so that one end is located beneath the sleeve and the other end protrudes from under the planar member 2 nearer the player. By ensuring that the chute is suitably inclined, any balls passing through the aperture 5 are delivered back towards the player.

Referring now to Figures 5 and 6, there is shown a standing platform 20 for use in association with the practice putting green. The platform 20 is of a size of about 0.85 m by 0.60 m and is formed of a wooden panel 21 held in a frame 22 formed of aluminium channel section. A layer of simulated grass 23 is provided on top of the panel and the platform is supported on four adjustable levelling feet 24, similar to feet 11, located one at each corner.

Figure 7 shows a cross-section of the putting practice green having a slightly modified frame 6'. The frame 6' includes a lower support surface 25 having a projection 26 and an upper support surface 27. The lower surface of the planar member 2 has a notch 28 which receives the projection 26 on the lower support surface 25. This locates the planar member securely on the frame 6 and prevents any lateral movement of the planar member. The frame further includes an arm portion 29, and a resilient cushion can be secured between the upper support surface 27 and the arm portion 29. The frame 6 also has an upstanding web 30 upon which a cover 31 can be mounted. The cover 31 has a hook portion 32 which fits over the upstanding web 30 to secure the cover in position. A skirt 33 depends downwardly from the hook portion 32 and ends in a corrugated portion 34 which can be trimmed into conformity with the support surface upon which the practice putting green is mounted. The interior of the frame 6' is provided with a guide nut 35 which allows the threaded shank 12 to be secured in the frame 6'. The frame shown in Figure 8 is similar to that shown in Figure 7 except for the omission of an upper support surface.

Figures 9A, 9B, 10A and 10B show a two planar members 2 for use with the modified frame 6' illustrated in Figures 7 and 8. In both cases the planar member 2 is provided with a pair of parallel notches 28 on the under side which run parallel to the longitudinal axis of the planar member 2. The notches 28 receive corresponding projections 26 in a frame which can be secured to either side of the planar member 2.

In use, the levelling feet 11 of the practice putting green are adjusted, by suitably rotating the nuts 14, so that the upper surface of the planar member 2 is entirely horizontal. The standing platform 20 is then positioned alongside, but spaced from, that end of the practice putting green most remote from the cup 10 and the levelling feet 24 are adjusted so that the standing platform is horizontal and coplanar with the practice putting green. The player stands on the platform 20, places a golf ball on the practice putting green in front of him/her and hits the ball towards the cup 10 after having adopted what he/she believes to be the appropriate stance and approach. Since the surface of the planar member 2 is completely smooth and horizontal, there is no interference with the run of the ball. Thus, if the ball fails to enter the cup 10, the reason for this is entirely because of the stance and approach of the player. The player can therefore modify his/her stance and/or approach and try again until he/she can consistently put the ball in the cup.

Claims:

1. A practice putting green comprising a planar member having a smooth surface, said member being formed of slate or like material having a surface of similar smoothness to slate, a simulated grass layer superposed on said surface, an aperture extending through said layer to receive the ball, and means for supporting the planar member so that said surface is horizontal.
2. A practice putting green as claimed in claim 1 wherein the simulated grass comprises a backing material to which fibres are attached so that they are generally perpendicular to the backing material.
3. A practice putting green as claimed in claim 1 wherein the simulated grass is a felted material.
4. A practice putting green as claimed in any preceding claim wherein the planar member is located in a frame extending around its periphery.
5. A practice putting green as claimed in claim 4 wherein the frame is formed of metal channel sections.
6. A practice putting green as claimed in claim 5 wherein the metal is aluminium.
7. A practice putting green as claimed in any one of claims 4 to 6 wherein the frame also accommodates a cushion of resilient material which retains the simulated grass in position on the planar member.
8. A practice putting green as claimed in any preceding claim wherein said means of supporting the planar member is in the form of a plurality of adjustable feet located around the periphery of the planar member.
9. A practice putting green as claimed in claim 8 wherein each of the feet is in the form of a threaded shank having a ground engaging portion at one end, a sleeve fitted to the shank and having an abutment supporting the planar member, and a nut threadingly engaged on the shank

between the base portion and the sleeve whereby rotation of the nut causes the sleeve to be displaced along the shank.

10. A practice putting green as claimed in any preceding claim wherein the aperture is in the form of an open ended sleeve and the green includes an inclined chute having an end in registry with and below the aperture to return the ball.

11. A practice putting green as claimed in any preceding claim in which the planar member has a thickness of around 20 cm.

12. A practice putting green as described in claim 1 substantially as hereinbefore described with reference to and as illustrated in Figures 1 to 8 of the accompanying drawings.

13. A kit of parts for assembly into a practice putting green as claimed in any preceding claim.

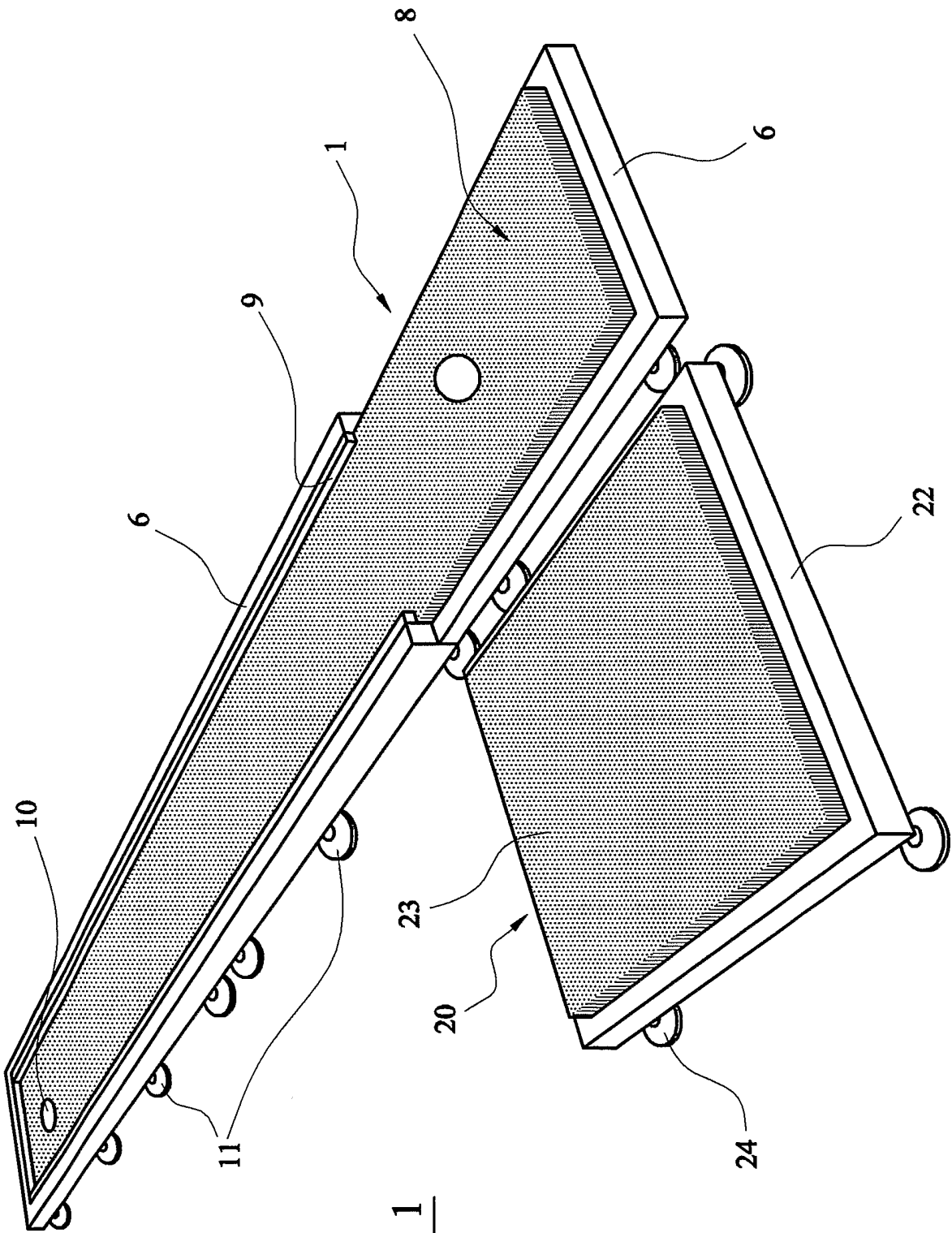


FIG. 1

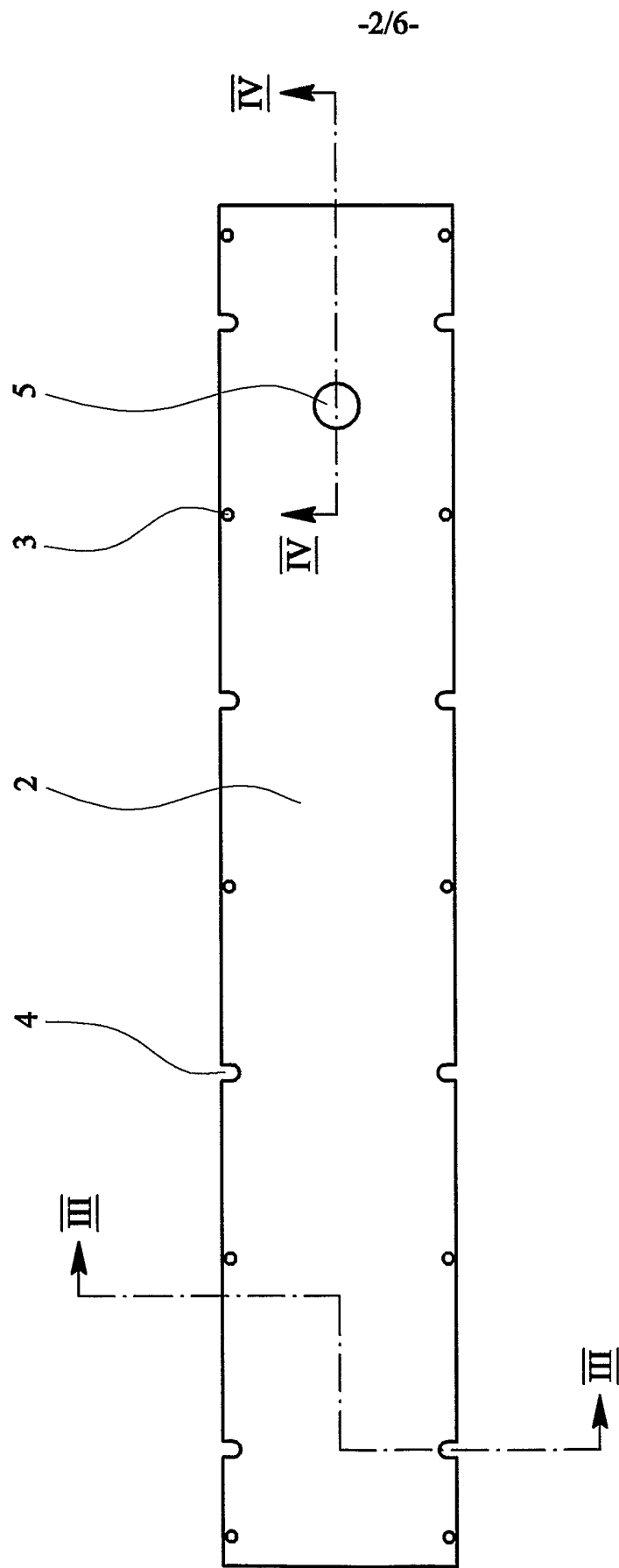


FIG. 2

-3/6-

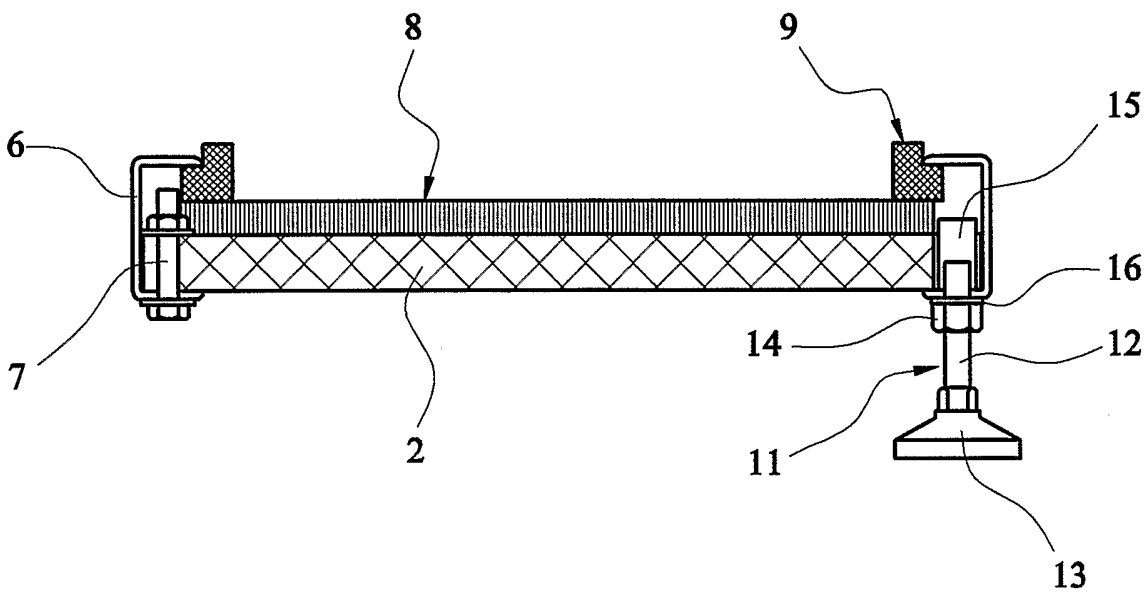


FIG. 3

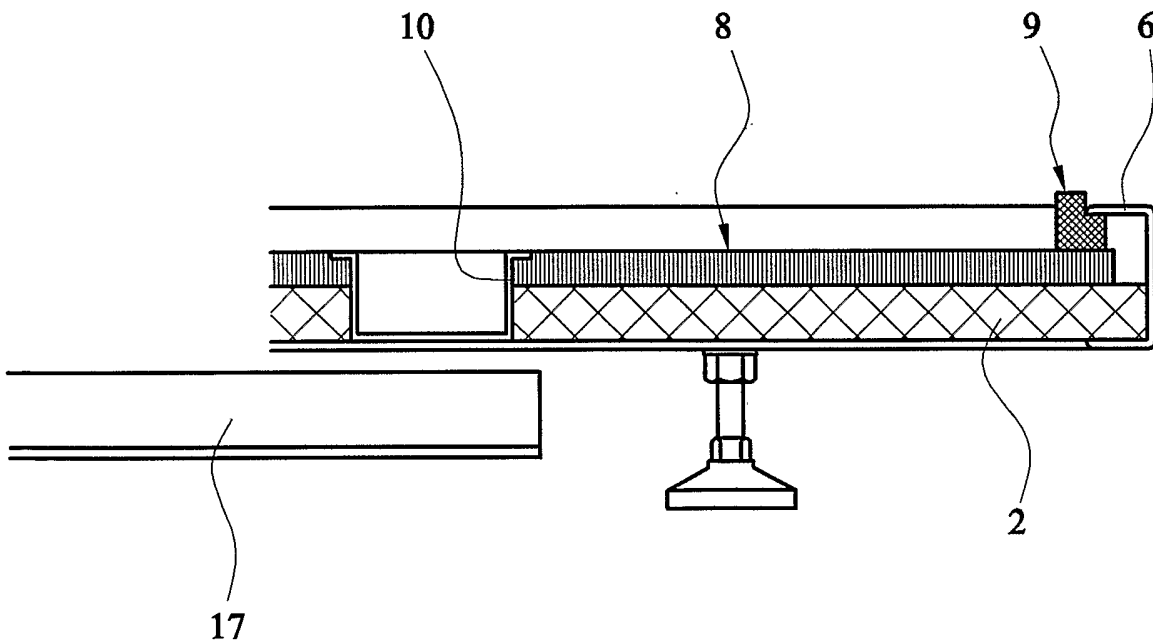


FIG. 4

-4/6-

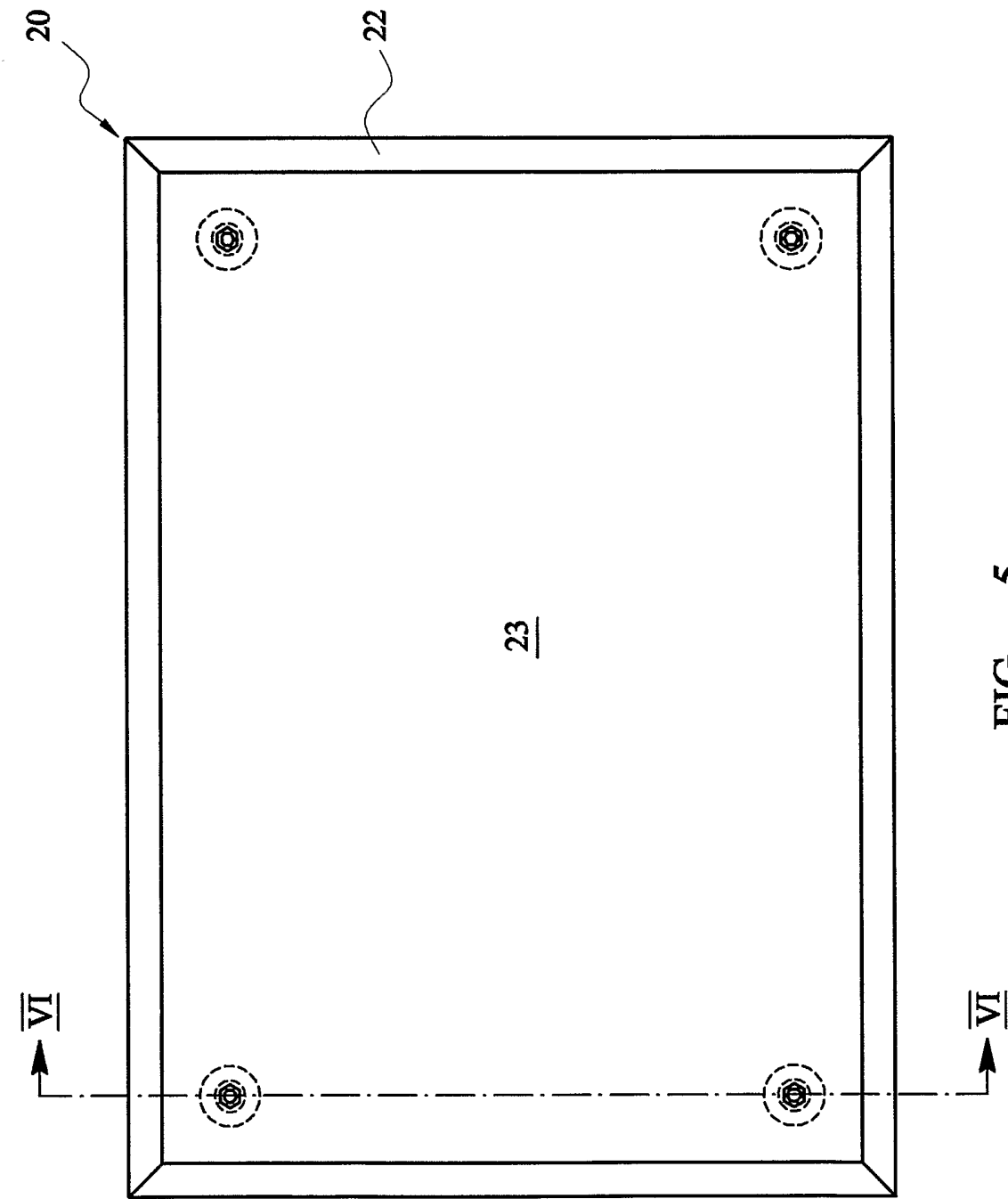


FIG. 5

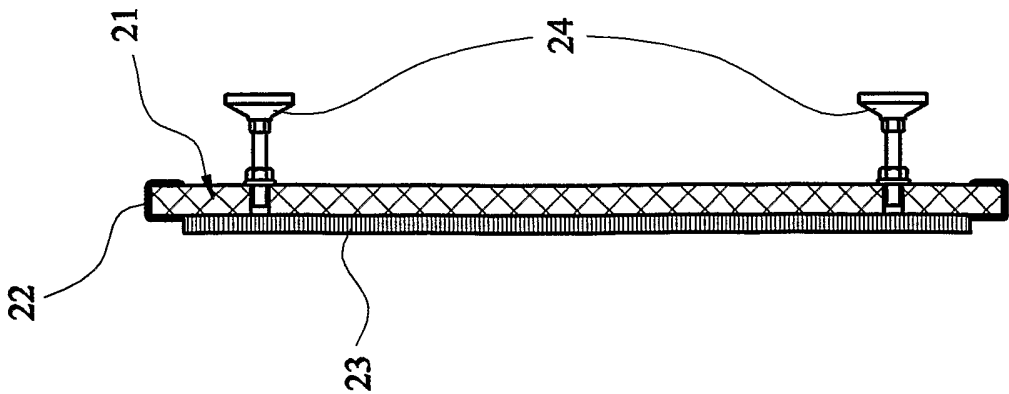


FIG. 6

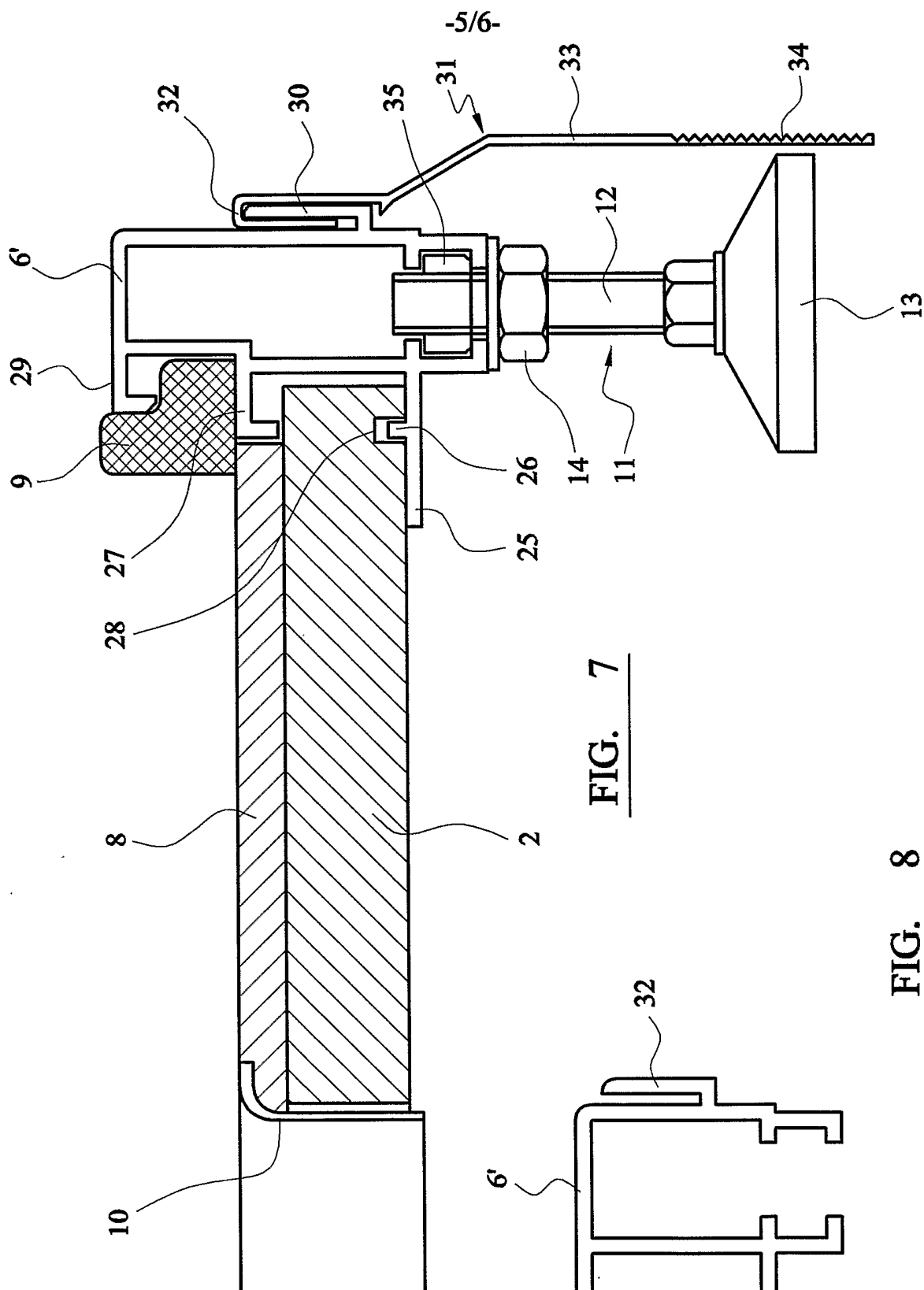


FIG. 7

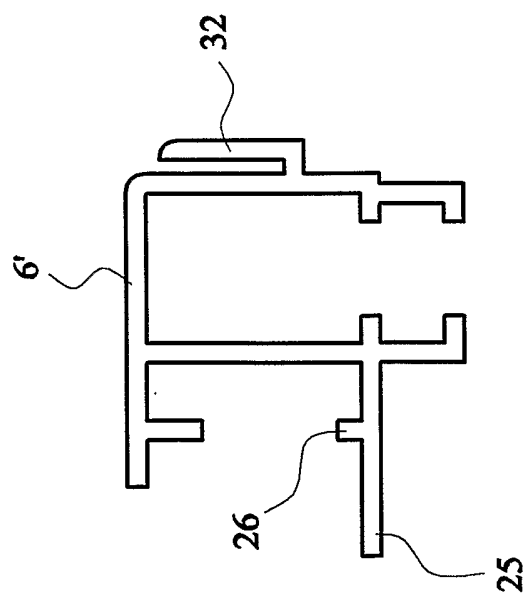


FIG. 8

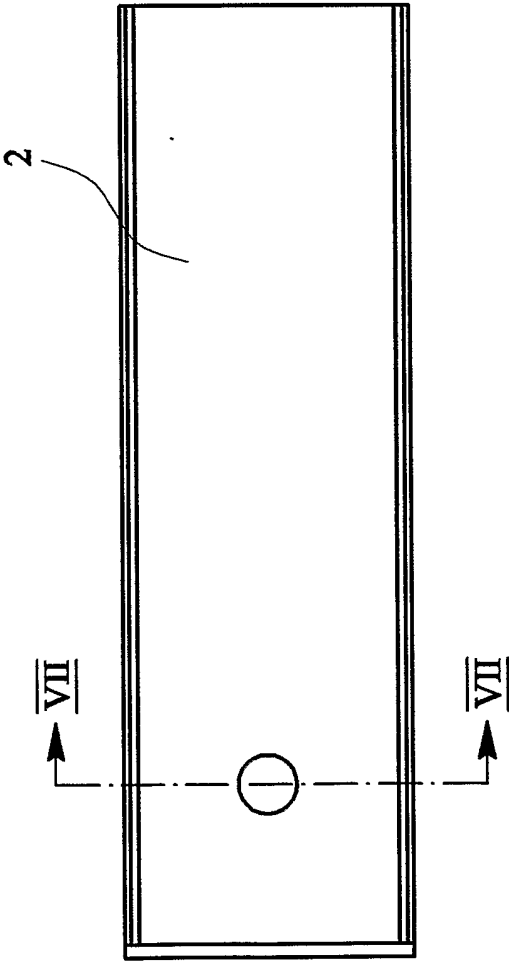


FIG. 9A

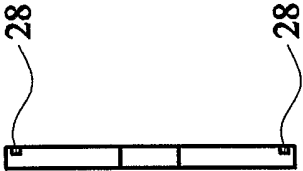


FIG. 9B

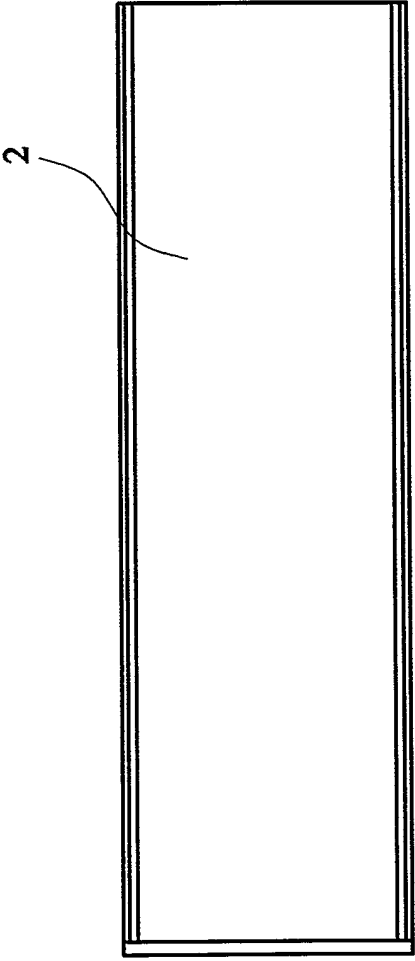


FIG. 10A



FIG. 10B