

June 2, 1953

P. D. BECKER
FURNITURE GLIDER

2,640,219

Filed June 28, 1949

2 Sheets-Sheet 1

FIG. 1.

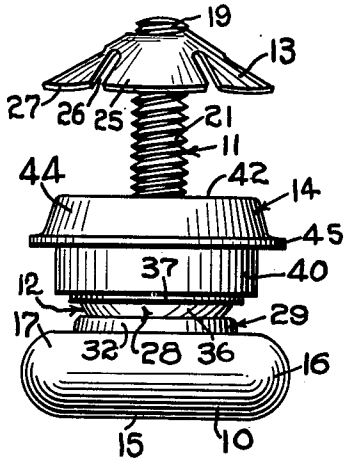


FIG. 2.

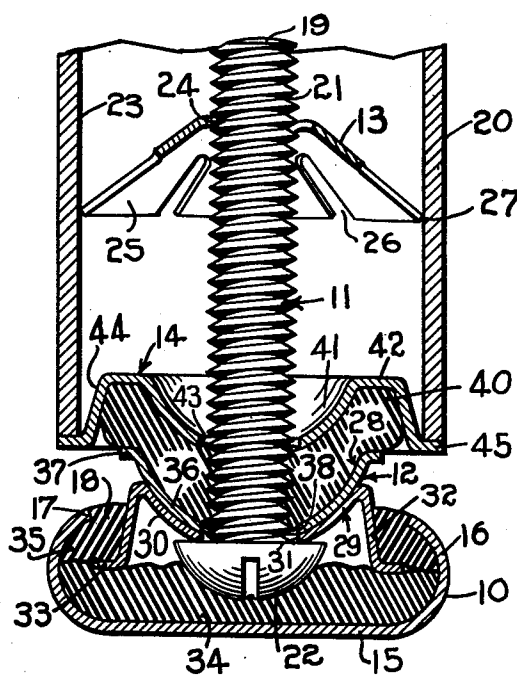


FIG. 3.

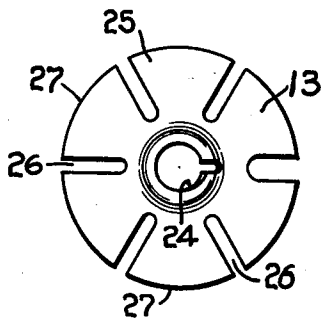


FIG. 4.

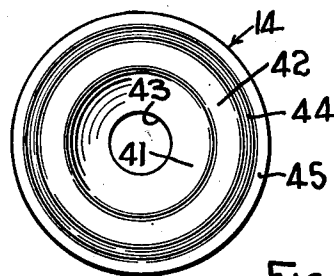


FIG. 6.

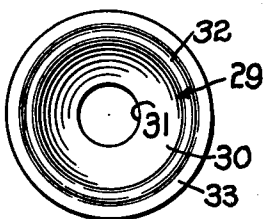
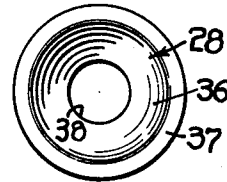


FIG. 5.

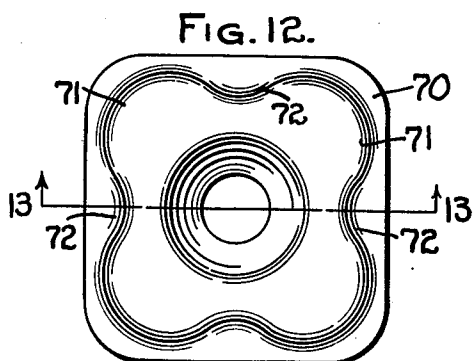
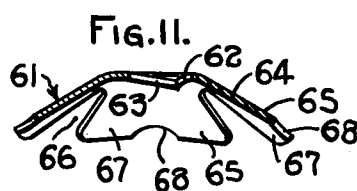
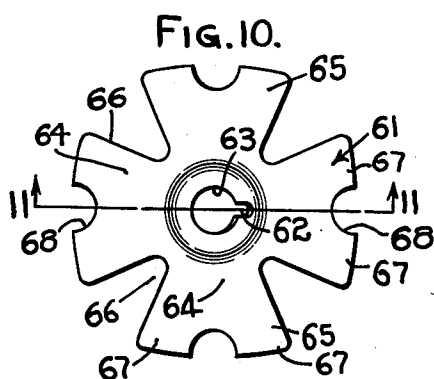
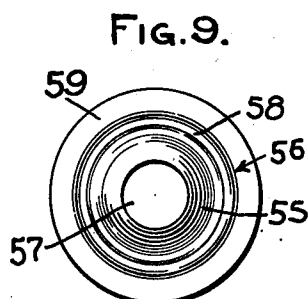
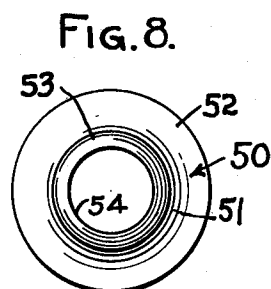
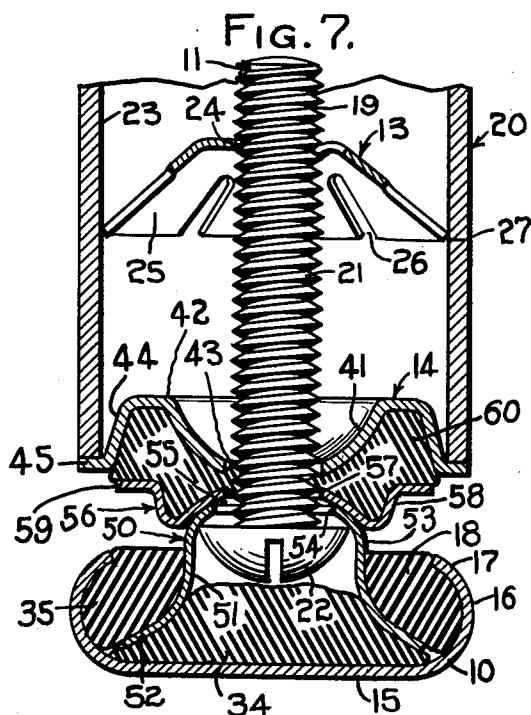


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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,640,219

FURNITURE GLIDER

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7 Claims. (Cl. 16—42)

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The present invention relates to furniture leg gliders and more particularly to furniture leg gliders adapted to be used with tubular metal furniture legs, and aims generally to improve the construction and operation of gliders such as those disclosed in my co-pending application Serial No. 85,698, filed April 5, 1949.

Heretofore, and as disclosed in my above-stated co-pending application, tubular metal furniture leg gliders advantageously include a cup-shaped metal glider shoe connected to a supporting post or part which in turn carries a resilient furniture leg-gripping member. In some instances a resilient cushion of rubber or the like has been interposed between the cup-shaped shoe and supporting post and/or the furniture leg. Such gliders have proven quite satisfactory for use with furniture legs, the terminal portions of which are substantially perpendicular to a floor or other supporting structure, but difficulty has been experienced in gliders adapted for use with furniture legs which make an acute angle with the floor.

A primary object of the invention, therefore, is the provision of a cushioned furniture leg glider of improved construction which will permit the glider shoe to be disposed at an angle to the furniture leg.

Another object of the invention is the provision of a glider for the legs of chairs and the like which will permit tilting of the chair under load without disturbing the flush bearing of the glider cap with the floor.

Still another object of the invention is the provision of an improved glider for furniture legs which will permit of tighter and more secure fastening of the glider to the furniture leg by a ratchet plate fastening.

A further object of the invention is the provision of an improved glider of simple and economical construction which will be fully cushioned and insulated against noise.

The above and other aims and advantages of the invention will be apparent to persons skilled in the art to which the invention relates from a consideration of the accompanying drawings and annexed specification illustrating and describing preferred forms of the invention.

In the drawings:

Fig. 1 is a side elevation of a preferred embodiment of furniture glider according to the invention;

Fig. 2 is a vertical sectional view of the glider illustrated in Fig. 1 and shown in applied position within a typical metal furniture leg;

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Fig. 3 is a top plan view of a ratchet plate fastening for the glider;

Fig. 4 is a top plan view of the wear plate;

Fig. 5 is a top plan view of the upper ball and socket member;

Fig. 6 is a top plan view of the lower ball and socket member;

Fig. 7 is a vertical sectional view similar to Fig. 2 showing a modified form of ball and socket joint;

Fig. 8 is a top plan view of the lower ball member;

Fig. 9 is a top plan view of the upper socket member;

Fig. 10 is a top plan view of a modified form of ratchet member;

Fig. 11 is a cross-sectional view taken on the line 11—11 of Fig. 10;

Fig. 12 is a top plan view of a modified form of wear plate; and

Fig. 13 is a cross-sectional view taken on the line 13—13 of Fig. 12.

Referring to the drawings, the improved glider comprises a glider shoe 10, preferably preformed and prefinished, assembled with a supporting post or member 11 in non-metal-to-metal contact by a ball and socket joint 12, a furniture leg-engaging fastener member or ratchet plate 13 carried by the post 11 and a furniture leg-engaging wear plate 14 surrounding the post and insulated from metal-to-metal contact with the shoe 10.

The glider shoe 10 may be of any suitable construction but is preferably similar to that shown in my co-pending application Serial No. 85,698, referred to above, and is formed of sheet metal, for example sheet steel, preformed to finished hollow cup-shape to provide a flat floor-engaging surface 15, an arcuate peripheral wall 16 of substantially semi-circular cross-section, and an upper inwardly turned flange 17 surrounding a central opening 18 of substantially less diameter than the body of the glider shoe so as to provide an enlarged cavity having a reduced entering throat through the opening 18. The hollow cup-shaped glider shoe may be preformed in any suitable manner, and preferably is heat-treated to increase its hardness and resistance to wear. It may then be coated with a suitable finish as, for example a chrome plating to improve its attractiveness and appearance. The resulting preformed shoe is of finished shape and contour and provides a durable attractive metal shoe highly resistant to wear.

The supporting member 11 comprises a tubular post 19 adapted to be disposed within a furni-

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ture leg 20 and having a groove or thread 21 adjacent its inner or upper end for receiving the fastening member 13 and a head or flanged portion 22 at its lower end for retaining the parts in assembled relationship as will appear more clearly hereinafter. Advantageously, the supporting member 11 may comprise an ordinary screw or bolt having a slotted or unslotted head portion and a threaded shank portion since this provides an economical stem or shouldered supporting part for the fastening member 13.

The fastening member 13 is designed to retain the glider assembly in operative position with respect to the end of a furniture leg 20 and is secured on the post 19 to engage an inner wall 23 of the leg 20. In the embodiment of the invention illustrated in Figs. 1 through 6 the fastener 13 advantageously comprises a dish-shaped spring metal plate having a central aperture 24 to receive the post 19 and a skirt portion 25 inclined downwardly from the central aperture 24 and peripherally notched as at 26 to provide circumferentially spaced leg-biting edges 27. Thus, the fastener member is a dish-shaped or generally cone-shaped member and is disposed on the post 19 so that the skirt portion 25 extends downwardly toward the glider shoe as shown in Figs. 1 and 2. The skirt portion 25 is normally of slightly greater diameter than the inside diameter of the leg 20, and when forced therein is radially contracted so that the biting edges 27 engage and grip the wall 23 of the leg 20 under tension with a ratchet-like action.

In order that the fastener 13 may grip the post 19 and be securely fixed in position thereon the central opening 24 is made somewhat smaller than the outside diameter of the post so that the edges of the material surrounding the opening will enter and engage the thread or groove 21. Thus, the fastener 13 is securely positioned on the post 19 and any relative movement between the post and the shoe 10, tending to place the fastener under strain when the glider is under load, is compensated for by the construction hereinafter described.

The post or supporting member 19 is tiltably supported in and insulated from the glider shoe 10 by means of the ball and socket joint 12 and discs or washers of suitable shock-absorbing and sound-deadening material, for example soft rubber. The ball and socket joint 12 comprises a ball portion 28 and a cooperating socket portion 29 in which the ball socket fits. The socket portion 29 has a concavely curved dish-shaped portion 30 centrally apertured at 31 to loosely receive the post 19 and having a depending annular skirt portion 32 terminating in an outwardly extending peripheral flange 33 to provide a cushion-supporting base which is preferably of a diameter closely fitting the aperture 18 of the shoe 10, permitting the flange to be inserted in the cavity of the shoe. The enlarged aperture 31 permits lateral and/or tilting movement of the post 19 with respect to the socket 29, the head portion 22 of the post retaining the socket in assembled relationship therewith.

The socket 29 is supported in and insulated from the glider shoe 10 by means of discs or washers of suitable shock-absorbing and sound-deadening material, for example soft rubber. Advantageously a compressible rubber disc 34 is provided between the floor-engaging surface 15 of the shoe and the flange 33 of the socket 29 and a compressible rubber washer 35 is provided between the flange 33 and the skirt 32 and the

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inturned flange 17 of the shoe 10. Both discs 34 and 35 may be of greater diameter than the flange 33 and shoe aperture 18, and preferably the disc 35 is of sufficient diameter and thickness to fill the upper portion of the shoe cavity between the flange 17 and flange 33 as shown in Fig. 2.

The ball portion 28 is preferably dish-shaped and has a convexly curved bottom portion 36 adapted to fit in the concavely curved dish-shaped portion 30 of the socket 29, the area of contact between the ball and socket portions preferably lying on a spherical surface so that the ball portion is universally movable or tiltable in the socket 29 in any desired direction. The dish-shaped portion 36 has an outwardly extending annular flange 37 at the upper end thereof and is centrally apertured as at 38 to receive the post 19. The aperture 38 is of a size such that the surrounding edges thereof engage the groove or thread 21 to secure the ball portion 28 in fixed position on the post 19. Thus, as the post 19 is tilted in any direction, the ball portion 28 accommodates itself thereto by a corresponding tilting movement in the socket 29.

The glider preferably includes a wear plate 14 and a compressible rubber washer 40 surrounding the post 19. The wear plate 14 desirably has a central dish-shaped portion 41 and a substantially flat rim portion 42 to provide a bearing surface for the washer 40. The dish-shaped portion 41 has a central aperture 43 for receiving the post 19, the aperture 43 being somewhat larger than the post so that the post may move laterally in the opening when tilted from its vertical position. The wear plate 14 further has an annular skirt portion 44 depending from the rim 42 and a peripheral flange 45 extending outwardly from the skirt portion 44. In assembled position the flange 45 is adapted to bear against the lower edge of the furniture leg with the skirt portion 44 disposed within and frictionally engaging the inner wall of the leg. Thus the wear plate 14 closes the lower open end of the leg 20.

The compressible rubber washer 40 is interposed between the wear plate 14 and the ball portion 28 and thus insulates the glider against transmission of sound between these parts. It also permits fastener member 13 to be driven a maximum distance within the leg 20 and upon expansion presses downwardly on the ball portion 28, thus maintaining the post 19 under tension to provide a more secure and rattle-free installation of the glider in the furniture leg.

The preformed glider shoe 10, supporting post 19, socket portion 29 and cushioning discs 34 and 35 may be assembled into a unitary structure by any suitable means such as the punch and two-part die shown and described in my copending application, Serial No. 85,698, dated April 5, 1949. This will involve the steps of (1) inserting the disc 34 into the cavity of the hollow shoe 10; (2) inserting the assembled post 19 and socket portion 29 through the opening 18 into engagement with the previously inserted rubber disc 34; and (3) forcing the rubber disc 35 into the cavity of the shoe. The compressible rubber washer 35, when inserted into the shoe cavity, will assume an irregular cross-sectional shape, filling the upper portion of the cavity between the flange 33 and skirt portion 32 of the socket portion 29 and the inturned flange 17 of the shoe 10, thus securing the shoe 10, supporting post 19, socket 29 and rubber discs 34 and 35 in unitary assembly. Thereafter, the ball portion 28, cushioning

washer 40, wear plate 14 and fastener member 13 may be assembled on the post 19 in positions substantially as shown in Figs. 1 and 2.

In mounting the glider in a furniture leg or the like, the ratchet 13 and post 19 are inserted into the leg and forced inwardly therein against the expansion action of the skirt portion 25 until the peripheral flange 45 of the wear plate 14 is positioned against the outer edge portions of the leg and resiliently held thereagainst by the expansive action of the rubber washer 40. When the fastener plate 13 is initially forced into the furniture leg it is contracted. As it expands to grip the leg and post 19, the post may be moved axially a short distance toward the open end of the leg so that the wear plate is not tightly held against the end of the leg. Use of the rubber washer 40 between the wear plate 39 and ball portion 28 provides a compressible cushion permitting the ratchet 13 to be forced a maximum distance in the leg to hold the wear plate securely thereagainst. The cooperating dish-shapes of the wear plate and ball portion on opposite sides of the cushioning, distribute the rubber cushioning material uniformly around the post 19 and avoid the necessity for too large a cushion.

When the furniture leg 20 is inclined to the floor at an acute angle either in its normal position or incident to its use, the post 19, fastener plate 13, wear plate 14 and ball portion 28 together with the washer 40 will occupy substantially the same positions relative thereto as shown in the vertical position of Fig. 2. However, by virtue of the ball and socket joint 12 permitting relative movement of the ball portion 28 and socket portion 29, and further by virtue of the compressible washers 34 and 35, permitting limited movement between the socket 29 and shoe 10, the shoe 10 will be tilted out of the position shown in Fig. 2 so as to be flush with the floor on which it rests. Thus, the improved glider construction of this invention permits the glider shoe to be disposed at an angle to the leg so that a chair or other object to which it is applied may be tilted under load without disturbing the flush bearing of the glider shoe with the floor.

In Figs. 7 to 9, I have shown a modified form of ball and socket joint designed to permit somewhat greater tilting movement of the post 19 and furniture leg with respect to the shoe 10. In this form of the invention the ball portion 50 has an annular skirt portion 51 provided with an outwardly extending peripheral flange 52 similar to the skirt 32 and flange 33 of the socket portion 29 and an upwardly extending convexly curved central portion 53 centrally apertured at 54 to loosely receive the post 19. The convexly curved portion 53 is designed to be received in the inverted dish-shaped portion 55 of the socket portion 56 which is likewise provided with a central aperture 57 to receive the post 19. The socket portion 56 is further provided with an upwardly extending rim 58 and an outwardly extending flange 59 which together with the inverted dish-shaped portion 55 cooperate with the wear plate 14 to grip the compressible washer 60 therebetween. This form of the invention functions in a manner similar to that of the device shown in Figs. 1 to 6, relative movement of the ball portion 50 and socket portion 56 permitting relative tilting movement of the shoe 10 and post 19.

In the modified form of fastener plate 61 in Figs. 10 and 11 a smaller aperture 62 adjoins the

central post-receiving aperture 63 so that the edges of the material surrounding the central aperture may be laterally bent to form a helical thread. This permits the plate 61 to be threaded on the post 19 and suitably adjusted thereon in any desired position. The skirt portion 64 of the fastener plate extends outwardly and downwardly from the central aperture 63 and is divided into a plurality of segments 65 by the inwardly extending notches 66. The segments 65 are further divided into individual furniture leg-engaging portions 67 by the semi-circular notches 68 and are transversely curved into a round cone-shape as shown in Fig. 11. This provides a particularly effective construction for use with square furniture legs and will securely grip the inner surfaces thereof to anchor the glider in position.

The modified form of wear plate 70 shown in Figs. 12 and 13 is particularly designed for use with a square furniture leg. However, the novel features thereof could be equally well adapted for a wear plate for use with round legs. The wear plate 70 is similar in construction to the wear plate 14 previously described except that the skirt portion 71 is scalloped to provide spaced indentations 72. These serve to locate the rubber washer 40 centrally, avoiding the necessity of a large washer and also to clear the lock seams of metal legs.

It will thus be seen that the present invention provides a simple and economical glider which is substantially noiseless and which permits the glider shoe to be disposed at an angle to the leg so that it may remain flush with the floor when the chair leg is tilted.

Various modifications of the invention described and illustrated will most likely occur to those skilled in the art to which the invention relates; and may be made without departing from the spirit of the invention, the scope of which is indicated in the attached claims.

I claim:

1. A furniture leg glider comprising a glider shoe, cooperating ball and socket members, a supporting post extending through both of said members and having a head retained by one of said members, said members being relatively movable to permit tilting of said post, compressible means securing said one of said members in said glider shoe, a wear plate movably positioned on said post and having a portion thereof for engaging the lower edge of a furniture leg, a second compressible means disposed between said wear plate and the other of said members for transmitting the load on said wear plate to said other member, and means for securing said post to a furniture leg.

2. A furniture leg glider comprising a glider shoe, cooperating ball and socket members, one of said members being anchored in said shoe, a supporting post extending through both of said members and having a head loosely retained by said one of said members, said members being relatively movable to permit tilting of said post, a wear plate mounted on said post above said ball and socket members and adapted to support the lower end of a furniture leg, and resilient compressible means mounted between said wear plate and the other of said members for transmitting the load on said wear plate to said other member and thence to said one member and said shoe.

3. A furniture leg glider comprising: a glider shoe; sheet metal ball and socket members hav-

ing cooperating opposed convex and concave surfaces and centrally disposed apertures, one of said members being secured to said shoe; a post extending through the apertures in said members and having a head disposed behind said one member; a wear plate surrounding said post to provide supporting surfaces for engagement with the wall of the furniture leg with which the glider shoe may be used; compressible means disposed between said wear plate and the other of said members to provide a resilient support of said wear plate by said other member; and means on said post for gripping engagement within the interior of such a furniture leg.

4. A furniture leg glider comprising: a glider shoe; sheet metal ball and socket members having cooperating opposed convex and concave surfaces and centrally disposed apertures, one of said members having a laterally extending peripheral flange disposed within said shoe; compressible means engaging said flange and said shoe and securing said one member to said shoe; a post extending through the apertures in said members and having a head disposed behind said one member; a wear plate surrounding said post to provide supporting surfaces for engagement with the base of the furniture leg with which the glider shoe may be used; a resilient member disposed between said wear plate and the other of said members to provide a resilient support of said wear plate by said other member; and means on said post for gripping engagement within the interior of such a furniture leg.

5. A furniture leg glider comprising: a glider shoe; a sheet metal ball member secured to said shoe, said ball member providing a convex outer surface and a concave inner surface and having an aperture extending therethrough; a post extending through said aperture and provided with a head disposed within said ball member; a socket member having a concave surface in engagement with the convex surface of said ball member and an aperture through which said post extends; a wear plate surrounding said post for engagement with the end of a hollow furniture leg; a resilient compressible member disposed between said wear plate and said socket member to provide resilient support of said wear plate by said socket member; and means on said post for engaging the interior wall of a hollow furniture leg and securing said wear plate against the end of such a furniture leg and said post head against the inner concave surface of said ball member.

6. A furniture leg glider comprising: a glider shoe having a base portion and an inwardly curl-

ing peripheral flange; a sheet metal ball member having a convexly curved central portion with an aperture extending therethrough and an outwardly extending peripheral flange disposed within said glider shoe; a compressible washer member disposed between said outwardly extending flanges of said ball member and said inwardly curling flange of said shoe securing said ball member to said glider shoe; a post having a head disposed within said ball member behind said curved central portion and extending through the aperture in said ball member; a socket member having a centrally disposed concave portion in engagement with the convex portion of said ball member and an aperture through which said post extends; a wear plate surrounding said post for engagement with the end of a hollow furniture leg; a resilient compressible member disposed between said wear plate and said socket member to provide resilient support of said wear plate by said socket member; and means on said post for gripping engagement with the interior surfaces of such hollow furniture leg to secure said wear plate against the end of such furniture leg and said post head in sliding engagement against the interior surfaces of the central portion of said ball member and thereby to secure the furniture leg glider in assembly with such furniture leg.

7. A furniture leg glider comprising a glider shoe, cooperating sheet metal ball and socket members having opposed cooperating convex and concave surfaces, said ball member being anchored in said shoe, and a supporting post extending through both of said members and having a head loosely retained by said ball member, said members being relatively movable to permit tilting of said post, and said socket member having a portion for bearing the load imposed by a furniture leg when the glider is attached to a furniture leg and transmitting such load through the cooperating surfaces to the glider shoe.

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