June 5, 1956 M. KRAMCSAK, JR 2,748,419

CASTER GLIDE

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Fig. 1.

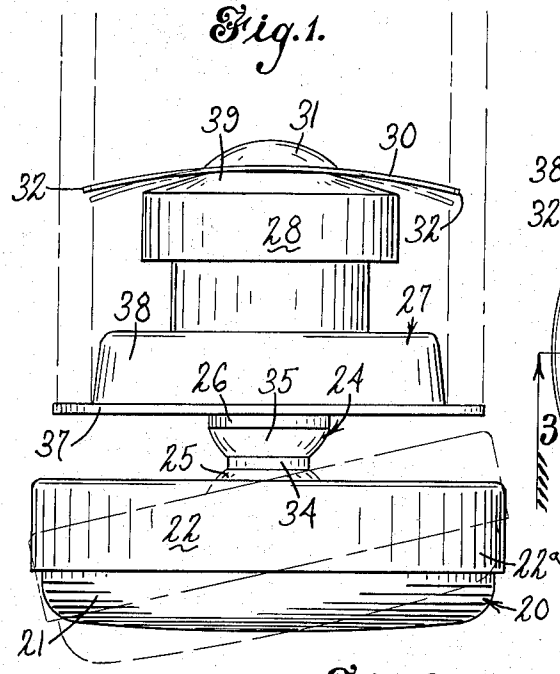

Fig. 2.

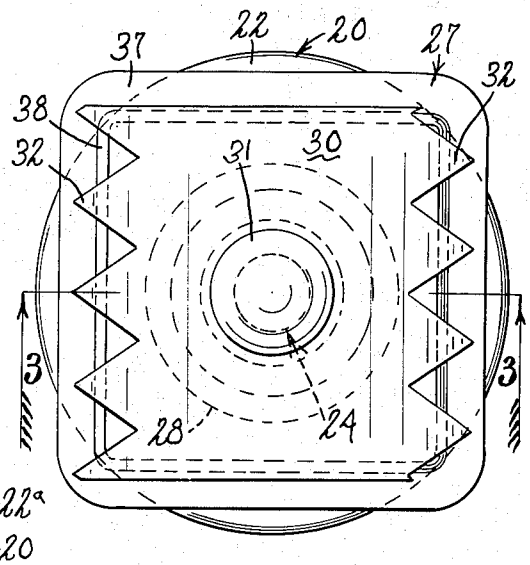

Fig. 3.

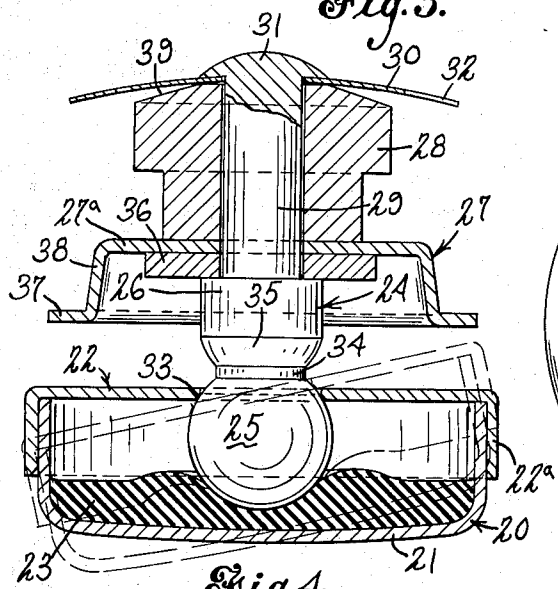

Fig. 5.

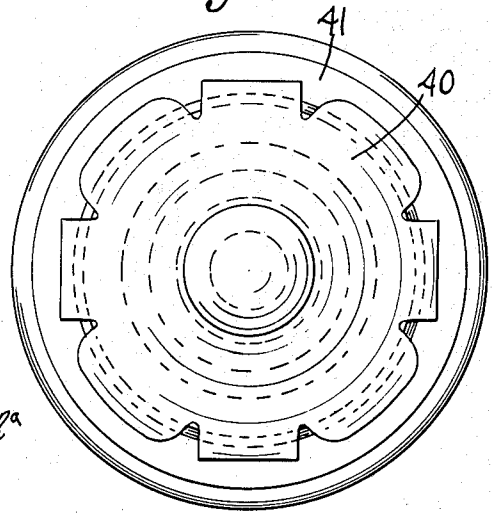

Fig. 4.

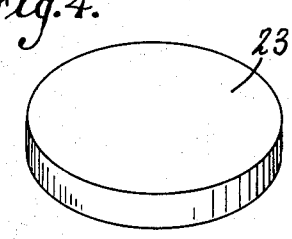

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Fig. 6.

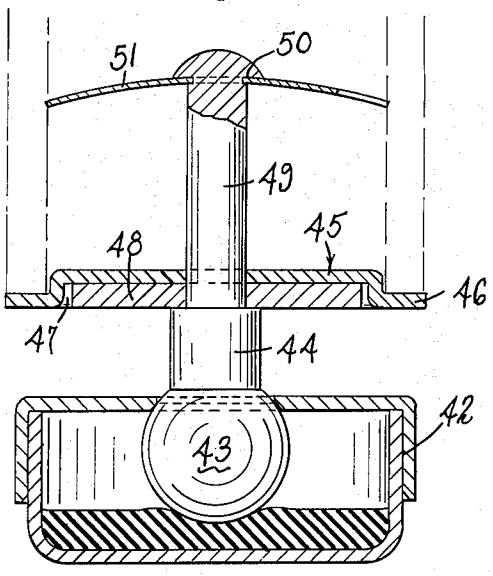


Fig. 7.

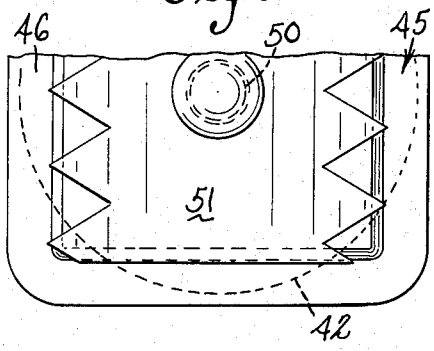


Fig. 8.

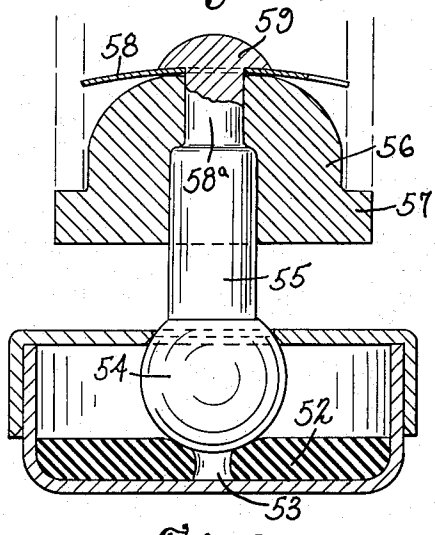


Fig. 10.

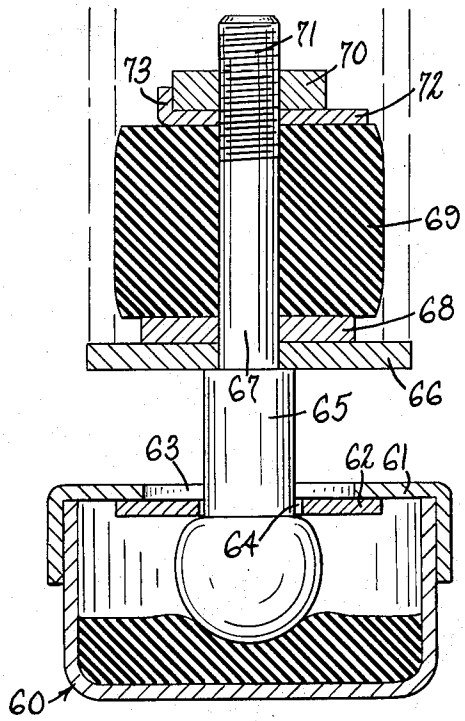


Fig. 9.

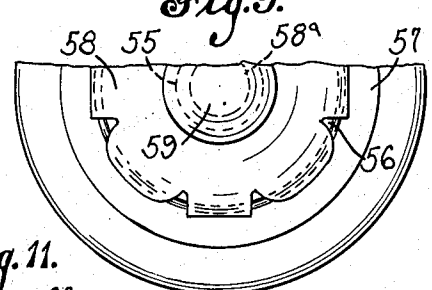
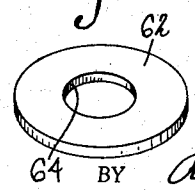


Fig. 11.



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2,748,419

CASTER GLIDE

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Application March 12, 1954, Serial No. 415,725

3 Claims. (Cl. 16—38)

This invention relates to caster glides and has special reference to those known as tilting glides where the base that is engageable with the floor can be arranged at any of a number of acute angles to the furniture leg. The glide is intended for use particularly with furniture having hollow legs, usually of metal, that are disposed at an acute angle to the floor, but it can be used also with legs that are normal to the floor. Where the leg is at an acute angle to the floor, the glide base can be readily adjusted to suit the angle of the leg within certain limits.

One of the objects is to provide a simple, inexpensive caster glide that can be readily installed in a secure manner and readily adjusted to the angle of the leg in order to meet different conditions of use.

Another object is to provide a caster glide of the type indicated having effective provisions for damping vibrations so that vibrations imparted to the base portion of the glide will not be transmitted to the furniture leg.

In the accompanying drawings:

Fig. 1 is a side elevation of a caster glide embodying the invention, a portion of the furniture leg being shown by broken lines;

Fig. 2 is a top plan view of the glide shown in Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a detail of the rubber disk serving as a cushion member;

Fig. 5 is a top plan view showing a modified form of glide;

Fig. 6 is a vertical central section of another modified form of glide;

Fig. 7 is a fragmentary top plan view of the glide shown in Fig. 6;

Figs. 8 and 9 are respectively a vertical central section and a fragmentary top plan view of a further form of glide;

Fig. 10 is a vertical central section of another glide; and

Fig. 11 is a detail perspective view of a base closing member shown in Fig. 10.

In the form shown in Figs.1 to 4, inclusive, the glide has a round tiltable base and is intended to be used in connection with a hollow metal leg of substantially square cross section. The base of the glide comprises telescoping sheet metal members, one acting as a cup and the other as a cover, and this base encloses a disk-like rubber member serving as a cushion which supports an upright tiltable stem, the lower end of which has a ball-like base enclosed within the hollow base. The part of this stem that projects upwardly from the base is provided with an integral collar or shoulder portion upon which is supported a leg-supporting plate of sheet metal having an outstanding flange engaging the lower edge of the leg. Above this leg-supporting plate, the stem has a cylindrical shank portion passing through a bore in a spacer member in the form of a body or block with an enlarged round dome-shaped upper end. The shank is extended upwardly beyond this spacer member and formed into

a riveted head for the purpose of holding in place a resilient rectangular dished metal retainer provided at opposite edges with teeth that bite into the inner surface of the leg wall when the glide is installed in the leg.

In the drawings, the base of the glide is indicated generally at **20**, the lower or cup member of the base at **21**, the cover at **22**, the rubber cushion at **23**, the tilting stem at **24**, the ball-shaped stem head at **25**, the outstanding collar portion of the stem at **26**, the leg-supporting plate at **27**, the spacer at **28**, the cylindrical shank portion of the stem at **29**, the resilient retainer at **30**, and the riveted-over head portion of the shank at **31**. The retainer **30** is generally of rectangular shape and bowed and its toothed edge portions at opposite ends of the bow are indicated at **32**.

Referring now to the details of this structure, it will be noted that the base **20** is a round base that is comparatively shallow, the lower member having an integral upstanding side wall and the upper member or cover **22** having a depending flange **22a** that is outside of said side wall and in tight press fit therewith, the upper edge of the side wall of the cup member being in firm engagement with the upper wall of the cover. As shown in Fig. 3, the rubber disk **23** which is made of rather soft rubber takes up somewhat less than half of the depth of the base cup, and when the stem is in the assembled position with respect to the base, the ball portion **25** of the stem is pressed into the rubber disk so as to deform it, as shown in Fig. 3, thus providing in the disk or cushion a substantial depression conforming to the contour of the ball-shaped portion.

In this form, the ball-shaped portion **25** is extended slightly beyond the upper surface of the base (Fig. 3) and the upper part of the ball portion is disposed in a round aperture **33** in the cover **22**, the edge of which aperture is preferably chamfered to conform closely to the ball portion. The cover **22** has a press fit over the cup **21** and when the cover is applied, the ball portion of the stem is forcibly held in a socket provided by deformation of the rubber disk. The result is that the cover forms part of the turning socket in which the ball can turn against resilient pressure so as to have a universal movement, the ball being under pressure from below from the compressed rubber disk and thus being firmly seated in the curved conforming and closely fitting seat formed in the metal cover as well as in the partly spherical seat in the rubber formed by impingement of the ball. Consequently there is always sufficient pressure on the ball to hold it firmly in a position to which it is adjusted and prevent displacement owing to a loose mounting. Thus the ball member can be tilted only upon exertion of substantial force in contradistinction to a stem mounting that would allow too free a movement. The socket part in the rubber is created by impingement of the ball against an initially plain or undistorted area of the rubber disk.

Between the ball portion **25** and the collar or shoulder **26** of the stem, the profile may be as shown in Fig. 3, there being a narrow neck portion **34** between the ball and the shoulder, the shoulder **26** being cylindrical and having a lower curved portion **35** leading downwardly to the neck **34**. The neck **34** is so located as to present a flattened upper boundary for the otherwise spherical part **25**.

On top of the upper surface of shoulder **26** and around the lower part of shank **29** is a round metal washer **36**. Overlying the washer **36** is the upwardly bent body portion **27a** of the plate **27**, the shank **29** extending through registering holes in the washer and in this body portion and in the spacer **28**.

The leg-supporting plate **27** is of substantially square shape to support a substantially square-shaped leg, having

an outturned lower flange 37 for supporting the leg and an upwardly inclined wall 38 joining the flange with the body portion or web 27a, the inclination of the wall 38 serving to center the plate 27 in the lower end of the leg.

The spacer 28 preferably has the form shown in the drawings, the same being provided with a cylindrical lower portion of reduced diameter integral with a cylindrical upper portion or head, said upper portion having a dome-shaped top 39. When the dished rectangular retainer plate 30 is in its normal position shown in Fig. 3, there is substantial divergence between the under surface of the retainer and the downwardly and outwardly curved surface 39 of the spacer. This divergence of the retainer from the dome-shaped support enables the retainer to be contracted sufficiently upon insertion into the leg to provide an effective anchoring of the glide in the leg.

By the arrangement described, the retainer and the leg-supporting plate are effectively and strongly mounted on the stem. The base of the glide is strongly and rigidly supported from the stem structure by the provision of the ball connection, as described above. However, on the other hand, the connection between the stem and the base is not too rigid for the intended purposes inasmuch as it is possible to tilt the leg and base relatively to each other without exerting an undue amount of force. When the angular adjustment between the base and the stem has been made, this adjustment will be maintained by the effective resilient pressure member provided within the base member, which pressure member presses the ball of the stem upwardly against its seat in the cover member of the base.

By the construction described, the leg-supporting plate 27 will be very strongly and firmly held in place above the shoulder portion of the stem.

Fig. 5 shows a modified form of the article adapted to be used with a metal hollow leg of round cross section. Here, the base is of the kind described above and the modifications of structure involve only the leg-supporting plate and the resilient retainer. The resilient retainer indicated at 40 is a round umbrella-type retainer similar to that disclosed in my Patent No. 2,641,016 of June 9, 1953. The leg-supporting plate 41 corresponds to the plate 27, previously described, but it is a round plate having substantially the same cross section as the plate 27.

Figs. 6 and 7 show a form adapted to a leg of the same kind as used with the glide of Figs. 1–3, but the arrangement for connecting the glide to the leg is different. Here, the base 42 corresponds substantially to the base 20 described above, but from the flattened top of the stem ball indicated at 43, a cylindrical body 44 on the stem extends upwardly. This portion supports a leg-supporting plate 45 which is substantially square, having a lateral leg-supporting flange 46 and having its perforated body portion or web lying only slightly higher than the flange 46 so as to provide a shallow rectangular pocket 47. This pocket 47 is of the proper depth to accommodate a substantially square perforated washer 48 surrounding the stem. The part of the stem surrounded by the elements 45 and 48 is a cylindrical shank 49 integral with the body 44. The body 44 supports the washer 48 from beneath, as shown. This washer supports the plate 45 on which the leg is supported. At the top of the shank 49, an annular groove 50 is provided in which is accommodated the apertured portion of a retainer 51 similar to the retainer 30. The upper extremity of the shank 49 is riveted or peened over to hold the retainer firmly in the groove 50.

It will be seen that this form of the article omits the separate spacer member such as 28 of the first form. The retainer is held in place by being clinched between supporting portions integral with the upper end of the shank.

In the form shown in Figs. 8 and 9, the base structure is similar to that shown in Figs. 3 and 6, although, in this case, the rubber disk 52 supporting the lower end of the stem has a hole or perforation 53 providing a starting point for the socket in which the ball 54 is seated. The perforation or hole 53 is of relatively small diameter and the ball rests on the rubber surrounding the hole.

In this form, a stem body 55 integral with the ball extends upwardly and into a spacer element 56 provided with an integral foot or flange 57 that supports the lower edge of the furniture leg which, in this case, is of round cross section. The spacer 56, 57 is similar to the spacer 55, 56 shown in Fig. 9 of Patent No. 2,641,016, mentioned above. This spacer presents a block-like dome, and a round apertured umbrella 58 is supported between the upper end of the dome and the upper end of the stem structure. The body 55 of the stem extends well up into the body of the spacer, as shown in Fig. 8, and integral with the body 55 is a short shank 58a of reduced diameter. The spacer has a bore portion of large diameter to receive body 55 and a bore portion of small diameter to receive shank 58a. The upper extremity of shank 58a is riveted or headed over, as shown at 59, so as to hold the umbrella 58 firmly in place against the upper end of the spacer. This is a simple and effective form of glide in which the angle between the leg and the base can be changed readily, as in the forms previously described.

In the form shown in Figs. 10 and 11, the base 60 is similar to the base 20 although somewhat deeper, and the cover 61 of the base has an underlying shiftable member 62 serving as a closure for an aperture 63 provided in the cover, said member being in the form of a washer engaging the under surface of the cover. The washer 62 has a central hole 64 surrounding the body 65 of the stem, and the washer is held in the upward position of Fig. 10 by making the lower end portion of the stem of shouldered form. As the stem is tilted in relation to the base, the washer 62 has a certain amount of lateral movement.

In this form of Figs. 10 and 11, the body 65, as before, provides a shoulder supporting a member upon which the lower end of the leg is supported. In this case, the leg is of round cross section and the leg-supporting member is a round perforated disk 66, a portion of the lower surface of which engages the part 65 around the cylindrical shank portion 67 of the stem. Above the disk 66 is a metal washer 68 on which rests a round block 69 of rubber, this block being compressed so that its side face is forced into tight contact with the inner surface of the leg. This compression of the rubber block is effected by a nut engaging a threaded portion on the upper end portion of the shank. The nut is indicated at 70 and the threaded shank portion at 71 and a metal plate 72 underlies the nut and rests on the top surface of the rubber block. This metal plate 72 is held in rigid angular relationship to the nut 70 by an upstanding flange 73 on the plate 72.

It will be noted that the shoulder support for the leg-supporting member provided upon the lower part of the stem above the ball is employed in the form of Fig. 6 and the forms of Figs. 8 and 10, as well as in Fig. 3. Fig. 6 has no spacer separate from the stem but a separate spacer is used in the forms of Figs. 3 and 8, respectively. In the form of Fig. 8, the spacer is made in one piece with the leg-supporting part, but in the form of Fig. 3 a separate spacer is employed above the leg-supporting member.

The cushioning member provided within the hollow base not only serves to hold the stem firmly with the base in adjusted position, but also acts as a damper to inhibit the transmission of vibrations from the floor to the stem structure on which the lower portion of the furniture leg is supported.

Various changes can be made in the structural details without departure from the principles of the invention and the scope of the claims.

What I claim is:

1. In a caster glide of the tilting type, a hollow base for engaging the floor, and a stem partially disposed in and

rising from the base and tiltably related to the base, said base comprising a shallow sheet metal cup with a substantially flat bottom and an upstanding substantially cylindrical wall, a sheet metal cover for the cup resting on said wall and having a depending substantially cylindrical flange standing outside of and tightly against said cup wall, and an elastic cushion member in the lower part of said cup in the form of a disk lying flatwise against the bottom of the cup, said stem having at the lower end an integral partly spherical head held by said cover against said disk under pressure and in distorting relationship thereto to form a socket, said cover where it is adjacent the upper portion of said head being shaped to conform closely to the head and thereby to hold the head in distorting relationship to said disk, said head extending partially below the disk level to a slight extent, but the greater part of the head standing above the level of the disk, said stem having a portion extending upwardly beyond the seat provided in said cover and provided with an upwardly facing shoulder for supporting a furniture leg, said shoulder being disposed at a level substantially above said cover.

2. In a caster glide of the tilting type, a hollow base for engaging the floor, and a stem partially disposed in and rising from the base and tiltably related to the base, said base comprising a shallow sheet metal cup with a substantially flat bottom and an upstanding substantially cylindrical wall, a sheet metal cover for the cup resting on said wall and having a depending substantially cylindrical flange standing outside of and tightly against said cup wall, and an elastic cushion member in the lower part of said cup in the form of a disk lying flatwise against the bottom of the cup, said stem having at the lower end an integral partly spherical head held by said cover against said disk under pressure and in distorting relationship thereto to form a socket, said cover where it is adjacent the upper portion of said head being shaped to conform closely to the head and thereby to hold the head in distorting relationship to said disk, said head extending partially below the disk level to a slight extent, but the greater part of the head standing above the level of the disk, said stem having a portion extending upwardly beyond the seat provided in said cover provided with an upwardly facing shoulder for supporting a furniture leg, said shoulder being disposed at a level substantially above said cover, a leg-supporting member around the stem supported from said shoulder, a spacer member surrounding said stem above said leg-supporting member and having integral upper and lower portions of which the lower is of smaller

diameter, and a dished retainer held against the upper face of said spacer by an enlargement at the upper extremity of said stem.

3. In a caster glide of the tilting type, a sheet metal cup of shallow formation having a generally cylindrical upstanding integral side wall, the bottom of the cup being substantially flat, an elastic disk fitted into and overlying the bottom of the cup and of substantial thickness but said thickness being substantially less than the vertical dimension of the cup, said disk providing at its upper face an initially plain or undistorted middle portion adapted to be impinged and deformed by a ball-shaped member, a sheet metal cover for said cup having an upper wall resting upon the side wall or rim portion of said cup and having a cylindrical depending wall overlying and in tight engagement with the side wall of said cup for securing the cover to the cup, a ball-shaped member within the cup impinging and distorting the upper middle part only of said elastic disk to form a shallow socket, said ball-shaped member being disposed in an opening in said cover, the edge portion of said opening conforming to the curvature of the ball-shaped member to provide a close conforming seat therefor, said ball-shaped member being held by the cover in deforming and socketed relationship to said elastic disk and the ball-shaped member being thereby held tightly relatively to the base member formed by said cup and said cover whereby the ball member can be tilted relatively to the base structure only upon exertion of substantial force, said ball-shaped member having at a part thereof, protruding from said cover, an integral upstanding stem provided with an integral shoulder at a substantial distance above said cover adapted to act as a support for a furniture leg, and said stem being continued integrally upwardly beyond said shoulder to provide a connection between said stem and a hollow furniture leg having its lower part supported from said shoulder.

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