April 10, 1962 A. J. MATTER 3,028,703

AUTOMATIC WOBBLE-STOPPING GLIDES FOR FURNITURE

Filed Nov. 26, 1958

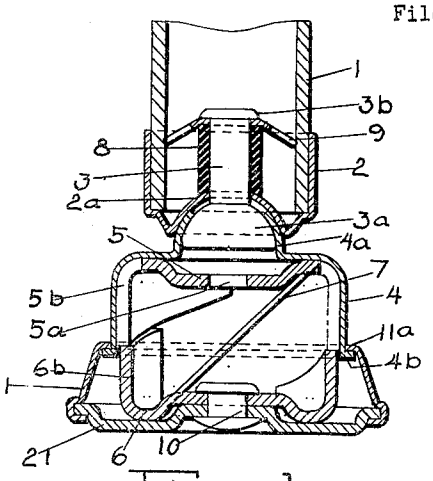


Fig. 1

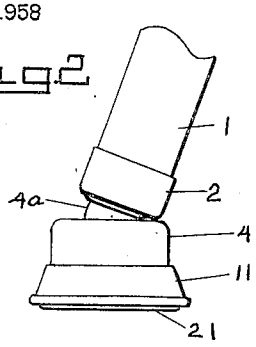


Fig. 2

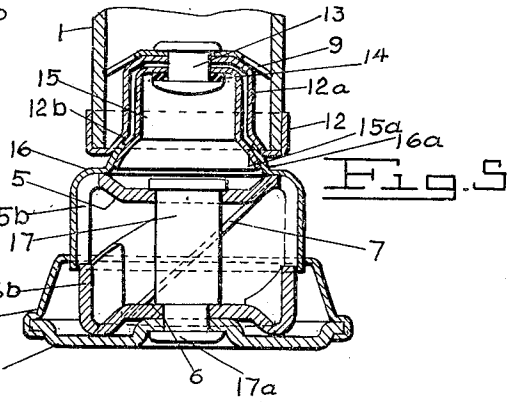


Fig. 5

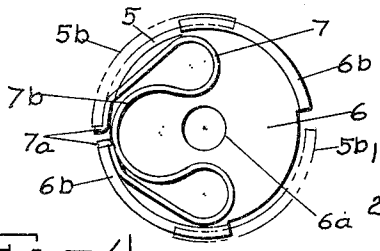


Fig. 4

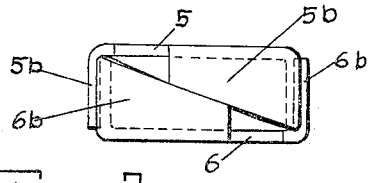


Fig. 3

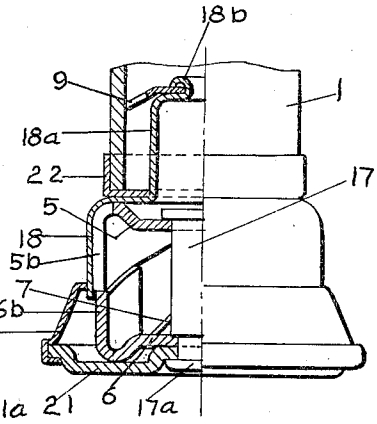


Fig. 6

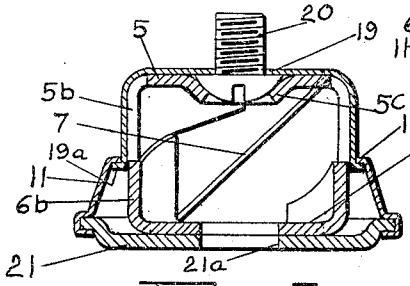


Fig. 7

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AUTOMATIC WOBBLE-STOPPING GLIDES FOR FURNITURE

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This invention relates to improvements in automatic wobble-stopping glides for furniture.

All floors are uneven and irregular in spots and permit tables, desks and other furniture thereon to wobble.

It is desirable therefore to provide such furniture with automatic means to prevent wobbling without detracting from the appearance of said furniture. To this end I have invented a wobble stopping glide which can be made to resemble standard glides now in use.

As many tables and desks now have angular tubular legs tapering to a small end I have provided this wobble stopping glide with swivel means between the glide and its attaching means, adapted to accommodate leg angles up to 20 degrees or more.

Another object is to provide means, incorporated in the device, to limit the expansive action of automatic adjustment which enables the device to follow the irregularities in a floor when the furniture is slid into place, so that it maintains a uniform, non-wobbling support at four points, two or three of which may be non-adjusting.

It has been found in practice that only one self adjusting glide is required with three or more non-adjusting glides, except that in cases of extreme irregularities in a floor surface two of my self-adjusting glides attached diagonally opposite will provide double adjustment.

The standard self-adjusting glide with ¼" adjustment is considered generally satisfactory as it takes care of hills and valleys ⅛" above and ⅛" below normal level of three or more adjacent stationary glides.

Another object is to provide a spring and construction of the various parts which are easily assembled and relatively inexpensive to make.

In my Patents No. 2,682,131 and No. 2,851,820 I describe an automatic wobble stopper and enclosing tamper-proof cover which however is limited in its smallest outside diameter in order to accommodate adjusting elements having three up-standing inclined wings on one or both of said elements. This is due to the necessity of providing the correct angles on the sliding edges of said wings and the right circumferential length thereof to provide easy automatic compressing action when sliding into place and at the same time provide an angle which will prevent compression under full load when stationary.

In order to reduce the diameter of the self-adjusting glide while retaining the desired angles referred to I have provided the adjusting elements with only two wings each instead of three.

These objects are attained by means of the improvements shown in the accompanying drawings, in which—

FIG. 1 is an elevation, in cross section, showing my preferred construction, on a scale of 2 to 1.

FIG. 2 is an elevation of the same in full size and shows a leg angle of about 20 degrees.

FIG. 3 shows the automatic adjusting elements in elevation, in compressed position.

FIG. 4 is a top view of the lower element shown in FIG. 3 with the end compression spring in place and the upper element shown in construction lines.

FIG. 5 is a cross sectioned elevation of a modified form of the device, wherein a center stud is attached, as by riveting, to the lower element, and serves to guide it and limit its movement when expanding. To provide space for the upward movement of the stud a hollow form of swivel joint is required as shown.

FIG. 6 shows another modified form, partially in cross-sectional elevation, wherein the swivel connection is omitted when used with vertical tubular legs. This reduces the number of parts required and costs less to manufacture.

FIG. 7 is a cross-sectional elevation of a modified form similar to that shown in FIG. 1, but with the swivel omitted and replaced by a screw for attachment to the flat under-surface of furniture bases. The machine screw shown may be replaced by a rivet or wood screw or other means of attachment.

Like reference numerals indicate similar parts throughout the several views.

2 indicates a cup-shaped ferrule adapted to fit a tubular furniture leg 1. As shown in FIG. 1, said ferrule has a perforated bottom 2*a* of hemispherical form adapted to receive a swivel-pin 3 provided with a hemispherical head 3*a* and having its stem slideably mounted in the perforated center of said ferrule 2. A sleeve 8 of rubber or other resilient material surrounds the stem of pin 3, and an umbrella-type spring fastener 9 is riveted on said stem.

A cup-shaped adjuster holder 4, having a flanged open end 4*b* is provided with a hemispherical extension 4*a* adapted to fit between the bottom 2*a* of the ferrule and the head 3*a* of the swivel pin and is held therebetween in light frictional contact by means of rubber sleeve 8 which has been compressed into assembly by riveting at 3*b* so as to provide rattle-proof but free moving swivel action.

The automatic wobble-stopping-action unit comprises two elements 5 and 6, similar in form, as shown in FIGS. 3 and 4, each comprising a circular disc perforated in the center at 5*a* and 6*a*, respectively and having axially extending wings 5*b* and 6*b* respectively. These wings have inclined cam-like edges, those on element 5 slidingly engaging those on element 6 so as to raise or lower element 5 when element 6 is rotated and thus cause the unit to expand or compress.

As it is desirable to normally hold the unit in expanded position a spring 7 is provided. Its unique shape is due to the necessity of using wire of a certain diameter and length and forming it to fit within the unit in such manner as to properly rotate element 6 from its compressed position to its expanded position. Spring 7 has bent ends 7*a* which engage wing ends of elements 5 and 6 so as to urge them apart, and the center portion of the spring is formed in a partial circle 7*b* in order to clear a center stud or screw when used as shown in the modified forms.

In order to function automatically it is necessary that the adjusting unit compress or expand easily when slid along a floor and not compress when the supported load is stationary. This requires that the wing edge angles be about 15 degrees from the horizontal and the spring must have just enough tension to properly rotate the bottom element 6 and maintain its bottom disc 21 in frictional contact with the floor surface upon which it sets. As upper adjusting element 5 must be held stationary relative to the load it supports it is attached to adjuster holder 4 as by press-fitting it therein. Lower adjusting element 6 is fitted freely in said adjuster-holder 4 which serves to guide the wings 6*b* in contact with wings 5*b*.

21 indicates a disc-like bottom member, preferably of hardened steel, and attached to adjusting element 6 as by a rivet 10 as shown in FIG. 1 or by welding as in FIG. 7.

A tamper-proof cover 11 is crimped onto the periphery of bottom 21, or may be integral therewith, and surrounds adjuster-holder 4 freely, so that it can slide and rotate thereon. An inturned edge 11*a* is provided and in conjunction with flanged rim 4*b* on the adjuster-holder 4 it limits the expansion of the adjuster unit.

In FIG. 5 is shown a modified form with a central stud

17 and a cupped swivel connection designed to provide room for the stud head to raise.

In this form the stud serves to further guide adjusting element 6 and limit its expanding action.

12 indicates a ferrule with a cup-shaped upward extension 12*a* having an arcuate lower surface 12*b* and perforated in the center for a rivet 13 which holds in assembly an umbrella-shaped spring fastener 9, a resilient washer 14, preferably of rubber, and an inner cup 15 having an arcuate lower rim 15*a*, adapted to resiliently hold between the aforesaid arcuate surfaces 12*b* and 15*a*, the up-standing arcuate extension 16*a* provided on a cup-shaped adjuster-holder 16.

The adjuster elements 5 and 6 are similar to those shown in FIG. 1 except that a headed stud 17 passes freely through element 5 and rivets together at 17*a*, element 6 and bottom disc 21. Spring 7 and cover 11 are similar to those shown in FIG. 1. Adjuster-holder 16 may have a plain un-flanged rim as limitation of expansion is herein accomplished by the headed stud 17.

For some applications it is not necessary to provide the more expensive swivel connection and this may be eliminated as shown in FIG. 6 wherein the adjuster-holder 18 is cup-shaped and provided with an extension 18*a* for stud space and formed at the center for attaching an umbrella-shaped spring fastener 9 by riveting as at 18*b*. The stud 17, adjuster elements 5 and 6, bottom disc 21, cover 11 and spring 7 are like those shown in FIG. 5. A ferrule 22 surrounds cup-shaped projection 18*a* and fits tubular leg 1.

For attachment to the under surface of a flat-bottomed base or furniture leg, the unit can be made as shown in FIG. 7 wherein the adjuster-holder 19 is cup-shaped and perforated for a center screw 20 which may have a machine screw thread or a wood screw thread or if preferred a rivet may be used instead of a screw. Either of these can be held in place loosely or rigidly as desired, by means of the embossment 5*c* in element 5 which is preferably press-fitted in the adjuster-holder 19.

Said adjuster-holder 19 is shown flanged at 19*a* in order to engage inward flange 11*a* of cover 11 for the purpose of limiting the expansion of the device. Bottom disc 9 and adjusting element 6 are joined rigidly as by welding or otherwise, and are perforated at 21*a* to admit a screw driver bit for operating screw 20.

All of these units are similar in operation for automatically stopping wobble of the supported furniture or appliance.

When attached along with three or more non-adjusting glides it is desirable that the self-adjusting glide, when at the central point of adjustment, have its bottom surface below the average level of the bottoms of the non-adjustable glides a distance equal to one half of the total adjustment, so that the bottom of the adjustable glide may raise or lower an equal distance above or below the normal level of the bottoms of the non-adjustable glides.

This will permit the adjustable glide to follow the irregularities in a floor surface when slid across the floor. Due to the wing surface angles and the expanding spring action, the adjustable unit will not collapse under the load to be supported, when stationary. Friction between the floor surface and the bottom surface of the adjustable unit is responsible for this and thereby provides the instant-acting wobble-stopping action.

What is claimed is:

1. The combination of a wobble-stopping glide comprising a two element self-expanding adjuster having an upper element rigidly attachable to an object to be supported upon a floor and a lower element rotatable on the same axis as said upper element, each of said elements having two interengageable coaxially disposed wings, inclined at their engaging surfaces at about 15 degrees from the horizontal, and a spring having ends urging said elements to rotate on their common axis so as to spread the elements apart; and means surrounding said elements, and limiting said spreading movement.

2. An expanding adjuster as described in claim1, wherein the said means for limiting spreading movement comprises a cup-shaped holder for said upper element having a peripheral flange, an enclosing cover and bottom member having an inturned peripheral flange adapted to rotate and slide upon said holder and by interengagement of said flanges limit said spreading movement.

3. An expanding adjuster as described in claim 1, wherein said means for limiting spreading movement comprises a central stud passing freely through said upper element and attached to said lower element and limited in its downward expanding movement by a head on the upper end of said stud.

4. The combination of a wobble-stopping glide as described in claim 1 having upper and lower elements automatically expansible; and a holder for said upper element having swivel means for attachment to an object to be supported upon a floor.

5. A wobble-stopping glide as described in claim 4, wherein said swivel means comprises an arcuate upper extension of said holder, a load supporting member having an arcuate lower portion resting upon said arcuate upper extension, and a swivel pin passing through said holder and load supporting members and having a hemispherical head fitting snugly within said upper arcuate extension and attachable to said load supporting member.

6. A wobble-stopping glide as described in claim 5 wherein said swivel pin is resiliently held up.

7. A wobble-stopping glide as described in claim 5 wherein said load supporting member has a cup-shaped upper portion adapted to fit onto a tubular leg and said swivel pin is held upwardly by a spring fastener attached thereto above an intervening elastic collar resting upon the bottom of said load supporting member.

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