

[54] INDEXING FURNITURE GLIDE
[75] Inventor: **Anthony J. Balchunas**, Rahway, N.J.
[73] Assignee: **Robert E. Miller & Co., Inc.**, New York, N.Y.
[22] Filed: **May 1, 1972**
[21] Appl. No.: **248,877**

2,998,197 8/1961 Kachergis 151/49
3,021,551 2/1962 Kramcsak, Jr. 16/42 T
3,006,673 10/1961 Swick 16/42 T

Primary Examiner—James T. McCall
Assistant Examiner—Doris L. Troutman
Attorney—Albert H. Kirchner

[52] U.S. Cl. 16/42, 248/188.9
[51] Int. Cl. A47b 91/06
[58] Field of Search 16/42, 42 T, 44,
16/19; 248/188.9; 151/49, 50

[56] **References Cited**
UNITED STATES PATENTS

3,430,287 3/1969 Schroeder 16/42
3,321,243 5/1969 Ferrara 151/49

[57] **ABSTRACT**

A glide is made adjustable axially in protruding relation to the hollow leg of an article of furniture by indexing means comprising extensions integrally projecting from the top of a housing that is fixed in the bore of the leg, thus forming spring fingers that are yieldably biased into engagement with flat sides of a stud that is threaded into a nut mounted in the bottom of the housing.

5 Claims, 5 Drawing Figures

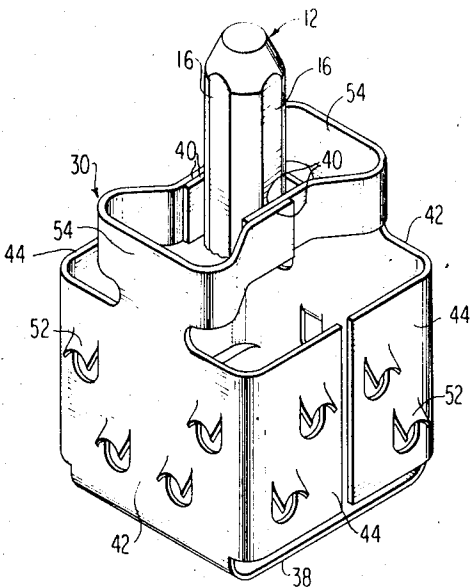


FIG1

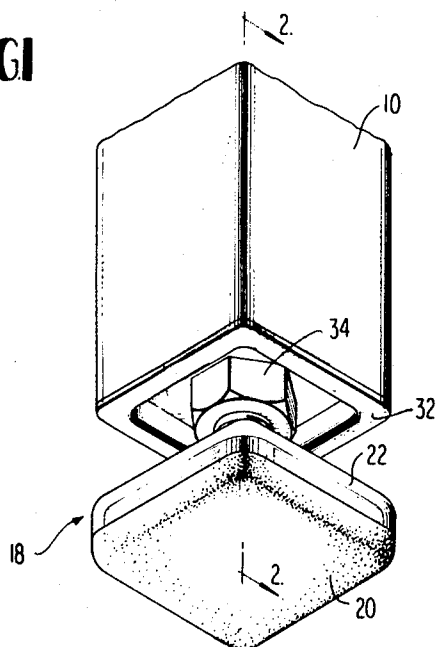


FIG2

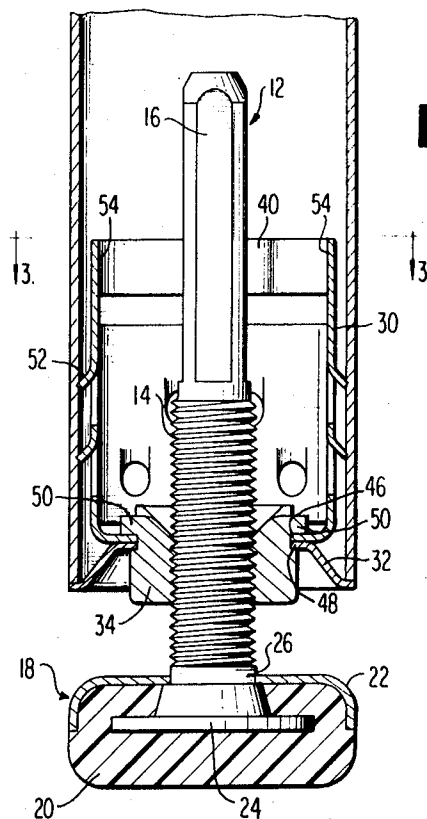


FIG3

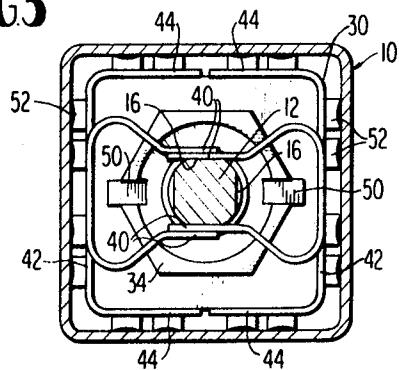


FIG4

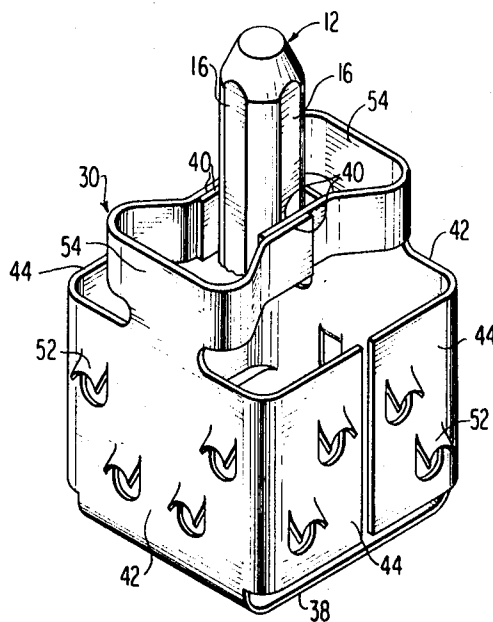
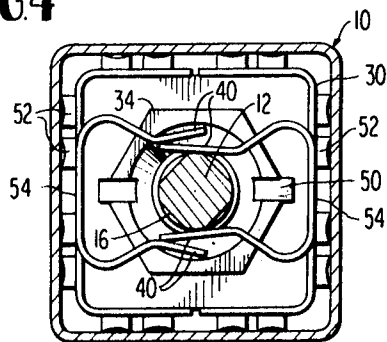


FIG5

INDEXING FURNITURE GLIDE

BACKGROUND OF THE INVENTION

It is frequently necessary to adjust the manufactured effective leg length of an article of furniture to enable the article to be positioned in stable mounting on a floor, particularly on a portion of a floor that may not be accurately smooth or level. This is particularly true in the case of metal furniture, or furniture such as chairs, tables, stools, bedsteads and the like which have legs of tubular metal which are not readily or desirably shortened by cutting, as is possible in the case of wooden legs. Moreover, it is generally required that such legs be tipped with shoes of rubber or the like to provide a cushion mounting of the article on the floor and prevent the scratching and marring that would otherwise result from movement of the naked metal edges across surfaces of wood or tile, or the tearing of rugs and carpets.

Both of these objects are traditionally accomplished by inserting up into each hollow metal leg a small protruding glide that has its lower end provided with a resilient shoe and has its upper end portion threaded into a nut fixed in the leg. Rotating the foot or protruding portion of the glide turns the stud more or less up into or downwardly from the nut and thus alters the effective length of the leg, so that such adjustment of all or some of the generally four legs of a chair, table or the like very effectively compensates for inequalities in the floor on which the article is to be set.

Improvements in the foregoing basic structure have been concerned with yieldably fixing the adjusted position of the stud in the nut, and hence in the spatial relation of the foot to the leg end so as to prevent unintended rotation of the stud and consequent maladjustment of the glide. This has generally required the use of spring means in the glide assembly, with means pre-setting the spring at a desirable degree of tension or pressure, but difficulty has been experienced with continued use causing variations on the spring force.

One improvement in the structure and mounting of the spring means is disclosed in a copending application, Ser. No. 187,335, filed Oct. 7, 1971, by the present applicant jointly with another, in which spring means are provided in the form of special leaf springs set in a housing which is adjustable in and out of the lower end of the leg by rotation of a stud carried by the housing and threaded in a nut that is fixed in the leg.

SUMMARY OF THE INVENTION

The present invention makes a further improvement. In the new construction a single metallic stamping is formed into a housing that fixes itself in the leg bore upon insertion therein and provides a complete set of spring fingers and mounts a nut into which the adjustable stud is threaded, thus substantially reducing the number of parts making up the whole assembly, simplifying the construction, and reducing the cost of manufacture, while at the same time producing a glide that is equal if not superior to the best of the prior art glides in respect of durability and operative dependability.

SHORT DESCRIPTION OF THE DRAWING

In the drawing,

FIG. 1 is a perspective view of the lower end portion of the square tubular metal leg of an article of more or less conventional furniture, such as a table, chair or the

like, showing a glide embodying the principles of the invention installed in operative position;

FIG. 2 is an axial cross sectional view taken on the line 2—2 of FIG. 1;

FIG. 3 is a transverse cross sectional view taken on the line 3—3 of FIG. 2, showing the glide set in adjusted position;

FIG. 4 is a similar view, showing, however, the glide in process of being adjusted to a set position; and

FIG. 5 is a perspective view of the box housing and a portion only of the stud showing the spring fingers seated in set position on the flats of the stud as in FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In these figures the reference numeral 10 designates the lower end portion of a metal leg or foot of any one of many specifically different kinds of articles of furniture, e.g., tables, chairs, stools, bedsteads and the like. The leg is of hollow or tubular shape, sometimes being made of wood with a cylindrical bore but generally of metal, in the particular case chosen for illustration being made of extruded or sheet metal and being square in cross section, with a bore of corresponding shape.

The glide provided by the invention comprises principally a stud 12 having its lower portion, amounting to substantially half the length of the stud, threaded as shown at 14, and the remaining half of its length, which may be left unthreaded, formed with a plurality of flat side faces, such as the four shown at 16. In the illustrated example of the invention the upper portion of the stud is substantially square in cross section, as appears in FIGS. 3 and 4. At its lower end the stud terminates in non-rotatable embedment in a foot 18. As shown particularly in FIGS. 1 and 2, this foot comprises a lower cushion element 20 in the form of a block of rubber or equivalent elastomeric composition capped by a top 22 of sheet metal. Non-rotatable mounting of the foot on the stud may be conveniently effected by providing the end of the stud with an enlarged head 24, with the neck portion 26 of the shank made polygonal in section between the head and the threaded portion 14. The stud is passed up through a hole in the cap 22 conforming to the shape of the neck 26, and the cushion 20, in the form of a block as shown in FIG. 2, is then molded around the embedded head.

The shape of the foot forms no part of the invention. It is desirably made square for application of the glide to a leg of square cross section, as shown in the illustrated embodiment of the invention. For use with legs of circular cross section the foot could be made circular in form.

The glide is completed by a box housing 30, a washer 32, and a nut 34 which mounts the housing and the washer on the stud.

The housing is made from a single piece of spring steel formed in the special shape best shown in the perspective view of FIG. 5. This comprises a body portion having a bottom 38 and a plurality of spring fingers 40 at the top of each of a pair of opposite sides 42.

The body portion is shown as square in cross section in the illustrated embodiment, thus conforming to the shape of the bore of the leg into which this particular glide is to be fitted. For use with a leg of circular or other cross section, the housing could be made with

correspondingly curved sides. Those two opposite sides heretofore identified as designated 42, 42 are each formed from a single area of the sheet metal upturned from one of the end edges of the bottom, and each of the other two sides is formed from two abutted halves 44, 44, each of which is a side extension inturned from one of the side areas 42 and bent right angularly at its lateral edges to combine with an identical opposite extension to make up the opposed third and fourth sides of the box shape.

The bottom 38 of the box housing is centrally apertured to provide a polygonal opening 46, and the washer 32 is centrally apertured to provide an identical opening 48. With the washer applied to the bottom of the housing 30, and the openings 46 and 48 in register, the nut 34 is slipped through the openings, and the nut is then fastened in place as by peening over two or more points on its top, as shown at 50. The margins of the opening in the bottom and of the hole in the washer may be seated in slots cut in opposite sides of the nut, or against shoulders formed by filing away short lengths of diametrically opposite corners of the hex shape of the nut.

The washer 32 is of inverted dish shape, with a perimeter larger than that of the housing 30, so that when the housing is inserted up into the bore of the leg 10 the washer will conform to the external outline of the leg end and neatly close the leg bore and, by seating against the margins of the leg opening, limit penetration of the housing up into the bore, as best shown in FIG. 2.

To hold the box housing fixed in the leg bore the several sides of the housing are provided with barbs 52 struck out from the sides and each best provided with sharp edge points as shown in FIG. 5.

The spring fingers are formed by extending central portions of the two solid sides 42, 42, upwardly beyond the tops of the sides, as shown at 54, 54, and then turning inwardly elongated side extensions each of which constitutes one of the fingers. The four fingers are bent toward the longitudinal axis of the assembly so that the terminal portions of the two fingers of each pair, which overlap in normally flat contact with each other as shown in FIG. 5, are, by the resilient character of the spring steel of which the box housing is made, yieldably biased against opposite sides of the stud 12.

The proportions of the threaded and flattened side portions of the stud are such that when the stud is inserted into the housing 30 and threaded into the nut 34, the spring fingers 40 will successively engage two opposite flats throughout the whole range of adjustment of the stud in the nut.

With the housing fixed in place in the leg bore by biting of the barbs into the surface of the bore, and being prevented thereby, as well as by the mating polygonal shapes of the housing and the bore in the illustrated embodiment, turning the foot 18 will adjust the degree of foot extension from the leg end by turning the stud further into or out of the nut 34. As the stud is turned, the spring fingers shift from their normal position of flat contact with each other and with one of the flat sides of the stud, shown in FIG. 3, through the temporarily expanded positions shown in FIG. 4, and then snap back again to their normal positions seen in FIG. 3. The engaged relation of the FIG. 3 position is maintained, so as to preserve the setting against all possibility of accidental or undesired rotation to maladjustment, but

rotation to a new adjustment is readily effected by the yieldability of the fingers through the FIG. 4 position. The adjustment can be made with a high degree of accuracy, inasmuch as the indexing is at quarter turn increments, in view of the formation of the stud shank with four flat sides as shown in the illustrated embodiment.

The new glide thus achieves its desired objectives, by a structure comprising a minimum number of parts. These comprise particularly the principal novel element of the combination, which is the box housing 30, providing in one piece, by a single sheet metal stamping, the means for securing the glide in the leg, the connection of the stud-mounting nut thereto, and the fingers that make the indexing connection with the stud.

It will be noted that all this is accomplished by elements that, with the exception of the foot cushion, are made of durable metal, so that there is nothing to wear out or become deteriorated with resulting loss of resilience as in the case of certain prior art glides that use plastic indexing members.

Within the broad principles of the invention as defined by the appended claims the illustrated specific embodiment may be altered and modified to different forms without departure from the scope and purview of the claims.

I claim:

1. An adjustable indexing glide for a hollow leg of an article of furniture comprising
 - a nut,
 - a box housing carrying said nut non-rotatably at its lower end and having side walls upstanding from said lower end adapted to make fastening engagement with the inner surface of the lower end portion of said hollow leg so as to mount the nut fixedly therein,
 - a stud having a lower threaded portion engaged in the nut and having an upper unthreaded portion provided with opposed flat surface areas,
 - and a foot non-rotatably fixed on the lower end of the stud and adapted to project from the lower end of the leg,
 - said box housing having at its upper end spring finger means inwardly extending toward the stud and being resiliently biased against the flat surfaces thereof,
 - thereby yieldably opposing rotation of the stud and indexing the degree to which the stud penetrates the nut on rotation therein and hence the extent to which the foot projects from the leg.
2. An adjustable indexing glide as claimed in claim 1 in which the box housing is formed from a single piece of spring sheet metal,
 - having sides defining a shape corresponding to the cross sectional shape of the leg bore,
 - and having barbs struck out from said sides for making said fastening engagement with the inner surface of the hollow leg.
3. An adjustable indexing glide as claimed in claim 1 in which the box housing is fastened in the leg against upward movement therein by a washer carried by the nut with its periphery underlying the bottom of the leg and in engagement therewith,
 - and against downward movement in the leg by barbs struck out from the side walls of the housing and engaged with the inner surface of the leg.

5

4. In an adjustable indexing glide for a hollow leg of an article of furniture,
 a box housing mounting a nut into which a stud having a terminal foot is threaded for adjustable protrusion from the lower end of said leg,
 and means securing said housing in said leg comprising a plurality of side walls each adapted to be positioned in close parallelism to a portion of the surface of the bore of said hollow leg,
 and a plurality of barbs struck out from each of said side walls for biting engagement with said bore surface,
 each barb comprising an obliquely downwardly directed tab having its distal edge centrally indented to provide sharp points at the outer corners of the tab.
 6. An adjustable indexing glide for a hollow leg of an article of furniture comprising
 a nut,
 a box housing formed from a single piece of spring sheet metal
 having a bottom portion mounted non-rotatably on the nut
 and having side walls adapted to make fastening engagement with the inner surface of the lower end portion of said hollow leg so as to mount the nut therein,

6

opposite end portions of said bottom portion being upturned to form a first opposed pair of said side walls of the housing,
 and opposite side portions of each of said first pair of side walls being inturned to form half portions of a second opposed pair of said side walls of the housing,
 whereby the housing is rectangular in cross section and has an open top and closed bottom,
 a stud having a threaded portion engaged in the nut and having an unthreaded portion provided with opposed flat surface areas,
 a foot non-rotatably fixed on the lower end of the stud and adapted to project from the lower end of the leg,
 and upper extensions formed on each of said first named pair of opposed side walls
 having their lateral end portions inturned to form spring finger means inwardly extending toward the stud and being resiliently biased against the flat surfaces thereof,
 thereby yieldably opposing rotation of the stud and indexing the degree to which the stud penetrates the nut on rotation therein and hence the extent to which the foot projects from the leg.

* * * * *

30

35

40

45

50

55

60

65