

[54] **ADJUSTABLE ROLLER DEVICE FOR SLIDING CLOSURES**

[72] Inventor: **Joseph F. Steigerwald**, 3240 East 59th Street, Long Beach, Calif. 90805

[22] Filed: **June 10, 1970**

[21] Appl. No.: **44,993**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 484,065, Aug. 31, 1965, abandoned.

[52] U.S. Cl. **16/105, 16/100, 16/19, 49/425**

[51] Int. Cl. **E05d 13/02**

[58] Field of Search **16/105, 100, 19; 49/425**

References Cited

UNITED STATES PATENTS

3,512,205	5/1970	Povoden.....	16/105
3,289,243	12/1966	Milete.....	16/105
2,980,947	4/1961	Rust et al.....	16/105
3,208,109	9/1965	Buck, Jr.....	16/105 X
3,097,401	7/1963	Riegelman.....	16/105
2,668,318	2/1954	Le Bon	16/105 X
3,175,255	3/1965	Saunders.....	16/105 X

809,695	1/1906	Keil	16/100
587,492	8/1897	Prouty	16/105

FOREIGN PATENTS OR APPLICATIONS

44,227 7/1927 Norway16/105

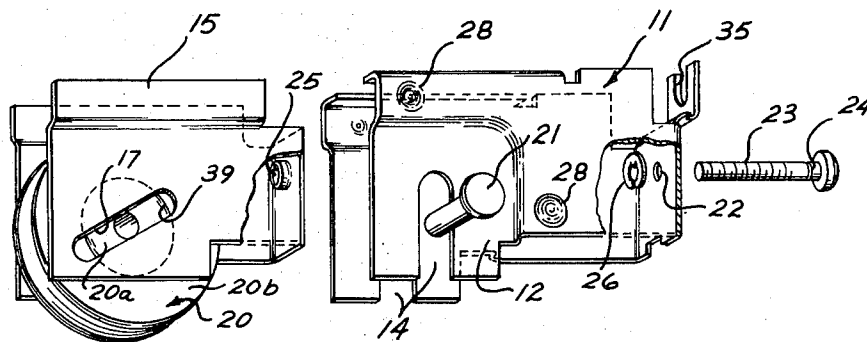
Primary Examiner—Bobby R. Gay
Assistant Examiner—Peter A. Aschenbrenner
Attorney—Sokolski & Wohlgemuth

[57]

ABSTRACT

A stationary outer frame member is attached to the bottom portion of a sliding closure, this outer frame having a pair of oppositely positioned vertical slots formed therein. An inner frame member having a pair of oppositely positioned canted slots formed therein is slidably mounted in the outer frame member. A roller wheel is mounted for rotation within the inner frame member on a pin which passes through the slots of both the inner and outer members, this pin holding these members and the wheel together. Vertical adjustment of the wheel without any lateral movement thereof is provided by means of an adjustment screw which causes the inner frame member to move relative to the outer frame member thereby causing vertical motion on the pin in the vertical slots formed in the outer frame member.

2 Claims, 10 Drawing Figures



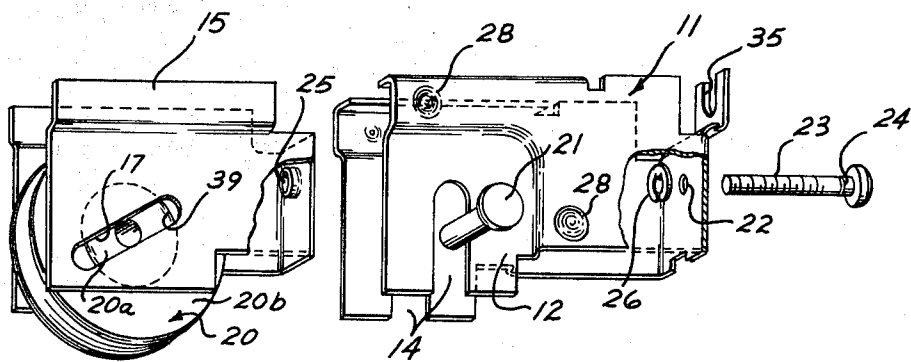


FIG. 1

FIG. 2

FIG. 3

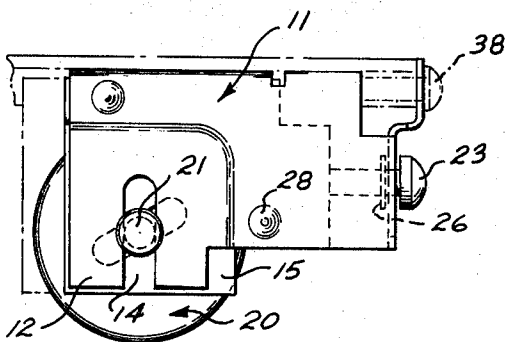
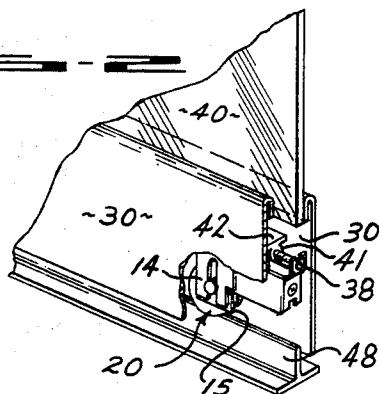
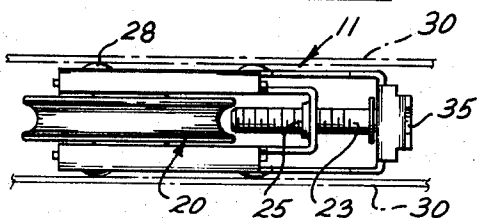


FIG. 4

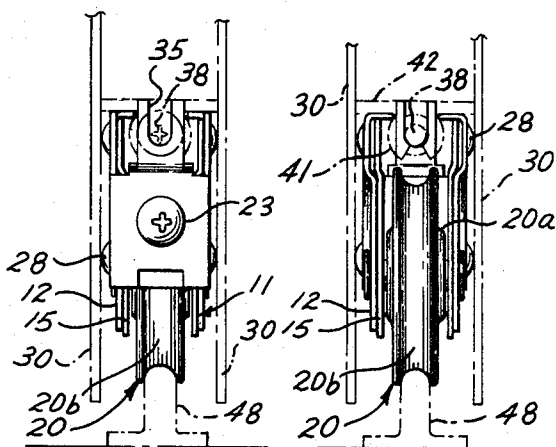


FIG. 5

INVENTOR.

JOSEPH F. STEIGERWALD

BY

Edward A. Sokolowski

ATTORNEY

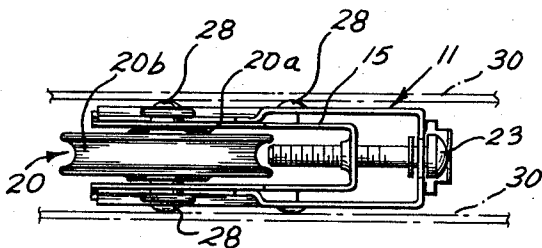


FIG. 7

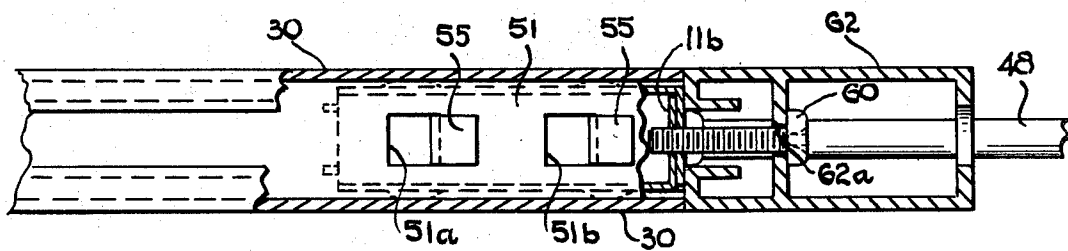
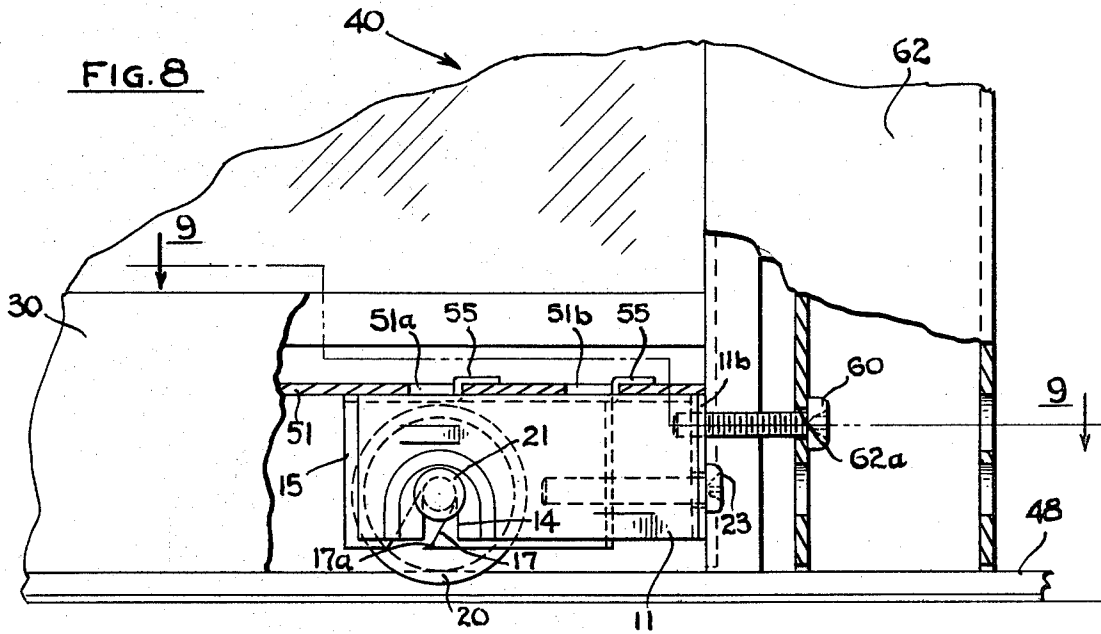


FIG. 9

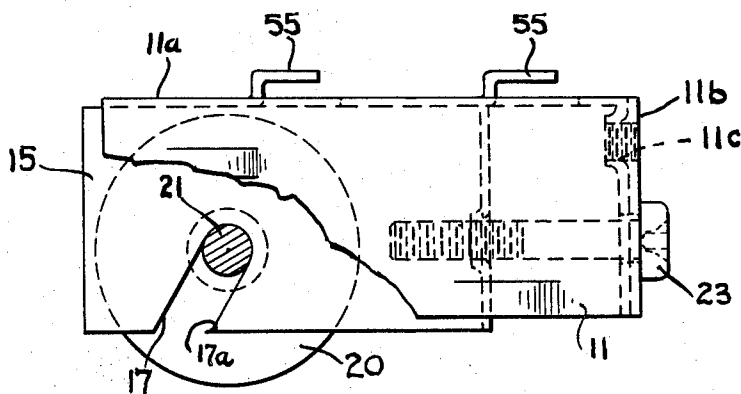


FIG. 10

INVENTOR
JOSEPH F. STEIGERWALD

BY

SOKOLSKI & WOHLGEMUTH
ATTORNEYS

ADJUSTABLE ROLLER DEVICE FOR SLIDING CLOSURES

This application is a continuation in part of my application Ser. No. 484,065, filed Aug. 31, 1965, now abandoned.

This invention relates to an adjustable roller device for sliding closures and more particularly to such a device which can be utilized to adjust the effective height of a closure relative to its support frame after such closure has been installed.

Sliding closures such as sliding doors and windows generally utilize roller members mounted along the bottom rails thereof which roll along a track attached to the base of the door or window aperture. Such roller devices are often made so that they can be removed from the closure and replaced when damaged or worn out. Further, it is highly desirable that means be provided to adjust such rollers vertically so that the closure can be made to properly fit in the support frame after installation has been completed. Thus, variations in the height of the closure aperture, both at the time of the initial installation and occurring later due to dimensional changes, can be accommodated by adjustment of the roller members to provide ideal sliding action.

While roller devices have been provided in the prior art which are readily removable for replacement and can be vertically adjusted with the closure installed, many of these devices exhibit certain shortcomings. Firstly, in achieving the vertical adjustment, a pivotal mount is often utilized with which a lateral displacement of the roller wheel occurs as vertical adjustment is made. This changes the load bearing position from the predetermined optimum point.

Still further, in many of the prior art devices, vibration loads tend to be transmitted to the wheel surfaces, thereby causing vibrational chatter with the noise and wear incidental thereto as well as the misadjustment caused thereby.

The device of this invention overcomes the above enumerated shortcomings in providing a roller device in which the roller wheel has no lateral movement as vertical adjustment is being made. The roller wheel is tightly coupled to its support frame for both upward and downward motion so that vibrational chatter of the wheel is minimized. Further, adjustment of the wheel member height under heavy loads is greatly facilitated by means of a canted slot in which the wheel member rides.

The device of the invention in achieving the desired improvement utilizes a stationary outer frame member which is attached to the closure, having a pair of oppositely positioned vertical slots formed therein, in which is slidably mounted an inner frame member having a pair of oppositely positioned canted slots formed therein. The roller wheel is mounted for rotation within the inner frame member on a pin member which passes through the slots of both the inner and outer assembly members and holds these members and the wheel together. Vertical adjustment is provided by means of an adjustment screw member for laterally positioning the inner frame member relative to the outer frame member, thereby causing vertical motion of the support pin in the vertical slots formed in the outer frame member.

It is therefore an object of this invention to provide an improved adjustable roller device for sliding closures.

It is another object of this invention to provide a roller device for sliding closures in which no lateral movement occurs with vertical adjustment thereof.

It is still another object of this invention to facilitate the vertical adjustment of sliding closures under heavy load conditions.

It is still a further object of this invention to provide an adjustable roller device for sliding closures in which vibration chatter is minimized.

Other objects of this invention will become apparent from the following description taken in connection with the accompanying drawings, of which:

FIG. 1 is a perspective exploded view of one embodiment of the device of the invention;

FIG. 2 is a perspective view illustrating the device of the invention as installed in a sliding glass door;

FIG. 3 is a top plan view of the embodiment of FIG. 1;

FIG. 4 is a side elevation view of the embodiment of FIG. 1; FIG. 5 is an end elevation view of the embodiment of FIG. 1 as taken from one end thereof;

FIG. 6 is an end elevation view of the embodiment of FIG. 1 as taken from the end thereof opposite to that of FIG. 5;

FIG. 7 is a bottom plan view of the embodiment of FIG. 1;

FIG. 8 is a side elevational view of a second embodiment of the invention as installed in a sliding glass door;

FIG. 9 is a view taken along the plane indicated by 9—9 in FIG. 8; and

FIG. 10 is a side elevational view with a partial cutaway of the second embodiment of the invention.

Referring now to FIGS. 1-7, one embodiment of the device of the invention is illustrated. Outer frame member 11 includes a recessed portion 12 which has a pair of vertical slots 14 formed therein. Inner frame member 15 has a pair of oppositely positioned canted slots 17 formed therein. Wheel member 20 has a central portion 20a which is mounted on a pin member in the form of rivet 21, and an outer portion 20b rotatably mounted on central portion 20a by means of ball bearing race 39. Rivet 21 not only serves as an axle for the wheel member but also is used to join frame members 11 and 15 and wheel member 20 together to form a unitary assembly. Rivet 21 is made to hold frame members 11 and 15 loosely enough so as to permit slidable motion of the frame members relative to each other.

Adjusting screw 23 fits slidably through aperture 22 formed in outer frame 11 and threadably engages threaded aperture 25 formed in inner frame 15. Screw 23 has a groove 24 formed therein in which lock ring 26 is engaged, the screw thereby being restrained from any substantial longitudinal movement relative to outer frame 11. Outer frame 11 has projections 28 formed in the outer walls thereof to provide frictional engagement with the bottom rails 30 of the closure. Outer frame 11 has a stepped portion 35 with a U-shaped slot formed therein for receiving an attachment screw 38 which is used to attach the roller device to the bottom rails 30 of closure 40, which may be a sliding glass door. Screw 38 threadably engages receptacle 41 which extends downwardly from web portion 42 which interconnects rails 30. The roller assembly is thus held tightly to the rail assembly of the closure by means of screw 38 and the frictional holding action of projections 28, yet can readily be removed therefrom merely by loosening screw 38.

Roller wheel 20 preferably includes a ball bearing race 39 on which outer wheel portion 20b rotates with the central wheel portion 20a being held to inner and outer frames 11 and 15 by rivet 21. Wheel 20 rides on track 48 which is attached to the base of the closure frame.

Vertical adjustment of wheel 20 is achieved by turning screw 23, a clockwise rotation of this screw drawing inner frame member 15 further within outer frame member 11, and vice versa. As screw 23 is rotated in a clockwise direction and frame member 15 is drawn further within frame member 11, rivet 21 is caused to ride further down on the inclined walls of slot 17 and thus further down in slot 14. This causes a downward motion of wheel 20. Due to the lateral restraint provided by the edges of slot 14, only vertical displacement occurs. Counter clockwise rotation of screw 23 causes inner frame 15 to move out of frame 11, thereby causing rivet to ride upwards in inclined slot 17 to effect an upward vertical motion of wheel 20. It is to be noted that wheel 20 is held firmly in the vertical position set by means of screw 23 at all times. Thus, the wheel is restrained against vertical and lateral movement so that vibration chatter, which might occur should the wheel strike an imperfection or foreign object on track 48, will be minimized. Screw 23 is always under tension, assuring the holding of the set position over long periods of operation. The mechanical advantage afforded by virtue of the inclined plane provided by canted slots 17 makes for substantially easier adjustment under load.

Referring now to FIGS. 8-10, a second embodiment of the device of the invention is illustrated. This second embodiment functions in the same general manner as the first, but differs therefrom in that the canted slots of the inner frame member

have open ends to permit the removal of the wheel member for replacement. Further, the second embodiment utilizes novel attachment means which facilitates the attachment of the roller assembly to a device such as a sliding glass door, and its removal therefrom. Like numerals have been utilized to identify like parts of the first embodiment. In view of the similar basic operation of the second embodiment to that of the first, only the newly added features will now be described.

Outer frame member 11 has a pair of oppositely positioned vertical slots 14 formed therein similar to those of the outer frame of the first embodiment. Inner frame assembly 15 has a pair of oppositely positioned canted slots 17. These slots differ from those of the first embodiment in that they are open ended so that rivet 21, which forms an axle for wheel 20, can be slid out of the slots to permit the removal of the wheel. The wheel is prevented from inadvertently dropping out of the slot 17 when being handled, by means of retainer lip portions 17a, formed at the entrance to the slots, these lip portions effectively narrowing the width of the slots at their open ends. The rivets can thus be slid out of the slots when positive pressure is applied for such removal but will not drop out inadvertently. The vertical positioning of wheel 20 is adjusted by means of screw 23 in the same fashion as described for the first embodiment.

Outer frame 11 has a pair of tabs 55 punched out of the top wall 11a thereof. In attaching the roller assembly to the bottom frame of a sliding glass closure 40, tabs 55 are fitted through apertures 51a and 51b formed in web structure 51 which interconnects the bottom rails 30 of the sliding glass closure. Looking at FIGS. 8 and 9, tabs 55 are seated to the right on web portion 51 so that they overlap the top surface of the web structure to provide hanging support for the roller assembly. Screw 60 fits through aperture 62a formed in vertical stile 62 of the closure, and threadably engages apertured portion 11c of the end wall of outer frame assembly 11. Screw 60 thus is utilized to hold the stile 62 to the rails 30 with the roller assembly providing the attachment medium by virtue of the engagement of tabs 55 with web 51 and the holding action of screw 60. This provides a simple and convenient means for joining the roller assembly to the bottom of the closure and with the same joiner mechanism holding the vertical stile 62 to the bottom rails 30 of the closure.

While the device of the invention has been described and illustrated in detail, it is to be clearly understood that this is to be intended by way of illustration and example only and is not to be taken by way of limitation, the spirit and scope of this invention being limited only by the terms of the following claims.

I claim:

1. In combination, a sliding closure having a pair of bottom rails and a web portion joining said rails together and an adjustable roller device attached to said web portion, said roller

device comprising:

an outer frame assembly having a pair of oppositely positioned walls and an end wall joining said oppositely positioned walls together, said pair of oppositely positioned walls having similar open ended vertical slots formed therein, said vertical slots being oriented opposite each other,

an inner frame assembly having a pair of oppositely positioned walls and an end wall joining said pair of walls together, said oppositely positioned walls of said inner frame assembly having similar canted open ended slots formed therein, said canted slots being oriented opposite each other,

a roller wheel having an aperture at the center thereof, defining the rotation axis of said wheel,

pin means for joining said wheel and said first and second frame assemblies together, said pin means fitting through the vertical slots in said outer frame assembly, the canted slots of said inner frame assembly, and the aperture in the center of said wheel, with said wheel and said frame members being held by said pin means in slidable relationship, said inner frame assembly having inwardly directed retainer lip portions formed at the entrance to the slots thereof, said lip portions narrowing the widths of the slot entrances to a width slightly less than that of said pin means,

adjustment means for positioning said inner frame member relative to said outer frame member along an axis normal to the longitudinal axes of said vertical slots and the rotation axis of said wheel, and

means for attaching said roller device to said web portion, whereby said wheel is capable of being positioned along an axis parallel to the longitudinal axes of said vertical slots in accordance with the setting of said adjustment means,

said means for attaching said roller device to said web portion comprising a pair of tab portions extending from the top wall of said outer frame assembly and having a portion thereof with a broad flat surface extending in a direction substantially parallel to said top wall, said web portion having apertures therein for receiving said tab portions, said sliding closure having a vertical stile portion extending along a vertical edge thereof, and screw attachment means for joining said stile portion to an end wall of said outer frame assembly, said screw attachment means holding said roller device with the flat surfaces of said tab portions thereof in close overlapping engagement with the web portion.

2. The combination of claim 1 wherein said screw attachment means comprises a single screw extending through said stile portion and threadably engaging the end wall of said outer frame assembly.

* * * * *

55

60

65

70

75