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(54) **TELESCOPIC GUIDES USED FOR FIXING NESTABLE DOORS OF RAILWAY WAGONS**

TELESKOPFÜHRUNGEN ZUR BEFESTIGUNG VON INEINANDERGREIFENDEN TÜREN VON EISENBAHNWAGGONS

GUIDES TELESCOPIQUES CONCUS POUR LA FIXATION DE PORTES ENCASTRABLES DU TYPE DE CELLES UTILISEES DANS LES WAGONS DE TRAIN

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a number of improvements made in telescoping guides normally used for locking doors, such as those used in railroad cars, which improvements provide an enclosure for the guides and thereby protect the rolling mechanisms from environmental factors, and provide a better support of the balls on the rolling tracks, as well as a stable positioning of said spheres as regards their separation.

BACKGROUND OF THE INVENTION

[0002] The applicant is the assignee of Spanish invention patent application number 9501451, in which a suspension mechanism is described for locking sliding doors, in which participates a telescoping guide based on several segments which slide on each other so that the door is joined to the end segment of the guide while its initial segment is joined by rods jointed to the car structure, so that by these rods the door may be locked and released, while by the telescoping guide the door may slide in order to open and close.

[0003] A similar structure is seen in the addition certificate to said patent with application number 9600313, in which the telescoping guide is double so that an intermediate segment is attached to the rigid car structure also through rods which enable to lock and release the guides, while the two end sectors of these guides, with the corresponding segments, allow a simultaneous mobility of two opposing doors.

[0004] In any of the two aforementioned records the segments of the telescoping guide have opposing grooves in which are provided the corresponding set of spheres to aid in their sliding.

[0005] However, such guides have a disadvantage which mainly resides in the following aspects:

- The various segments of the guide, or of each guide, are open on one their sides, so that the sliding means, both the tracks and the balls are in an exposed situation implying a likely reception of dust and dirt on said sliding means, with the ensuing problems implied for the functionality of the doors.

- Balls which take part in the sliding means are free inside the corresponding guides, so that they may accumulate at any of their points without an even distribution which would obviously improve their functionality.

- The rolling tracks of the guides have a curved configuration with a radius of curvature which is considerably greater than that of the balls, so that these contact the track on a single point, which in addition to implying a maximum load concentration on said balls allows a certain sideways jolting of the door, which must be limited by additional guides placed underneath the door.

DESCRIPTION OF THE INVENTION

[0006] The improvements disclosed in the invention solve the aforementioned problems in the various aspects considered in a fully satisfactory manner.

[0007] For this purpose and more specifically, according to one of the characteristics of the invention the inner guide adopts a configuration in an shape resembling an "E", so that its rolling tracks are placed in its middle arm, to which is added an enveloping intermediate guide with a U shape, while the outer guide also has a U shape, with its concave surface facing the inner guide and so that the ends of its lateral arms adopt a position of maximum approximation to the extreme guides of the inner guide, providing an enclosure of said inner guide which protects the rolling means provide inside said enclosure.

[0008] According to a further characteristic of the invention each set of balls which relates the two guides is aided by a type of cage which maintains the balls suitably separated from each other, preventing unwanted groupings which would have a negative effect on the guide's operation.

[0009] Finally and according to a further characteristic of the invention, the rolling tracks provided in said guides are given an angular configuration, so that contact of each ball with them occurs in two clearly separated points, which in addition to providing an improved load transmission between said balls, conveniently stabilises the guides against the door's tendency to jolt sideways.

DESCRIPTION OF THE DRAWINGS

[0010] These and further advantages of the invention will be better understood in view of the accompanying drawings of a preferred embodiment, where for purposes of illustration only the following is shown:

Figure 1.- Shows a schematic. cross sectional view of a group of three telescoping guides designed to support a locking door of the type used in railroad cars, according to the improvements object of the present invention.

Figure 2.- Shows an enlarged detail of the previous figure of a ball which relates the various guides, according to another improvement of the invention.

Figure 3.- Shows a side elevation view of one of the cages meant to distribute the balls in each guide of figure 1.

Figure 4.- Shows a plan view of the cage of the previous figure.

Figure 5.- Shows, finally, a side view of the same cage.

PREFERRED EMBODIMENT OF THE INVENTION

[0011] In view of these figures and particularly of figure 1, it may be seen that in accordance with one of the improvements of the invention inner guide (1) has an approximately E-shaped configuration, so that in its middle arm (2) are established, above and below, respective rolling tracks (3) for intermediate guide (4), which in turn has a U-shaped configuration with its concave surface facing inner guide (1), so that the side arms (5) frame middle guide (2) of said inner guide and internally include the corresponding rolling tracks (6), with said side arms of intermediate guide (4) externally provided with tracks (7) for outer guide (8), which is also U-shaped but considerably larger, with its concave surface facing the inner guide (1), so that its side arms (9) are at the same level as end arms (10) of said inner guide (1) in a position of maximum approximation to these, thereby defining only narrow grooves (11) to prevent direct contact between the two guides.

[0012] According to this construction and as derived from observing figure 1, inner guide (1) and outer guide (8) define a nearly closed compartment which houses intermediate guide (4) and all the rolling means, thereby achieving two functions, on one hand eliminating hazards for workers in later maintenance operations by preventing fingers from entering the guide, and in addition providing a well-sealed unit which prevents entry of foreign elements which may damage or hinder its operation.

[0013] In addition to the structure described, and as seen in figure 2, any of said rolling tracks (3), (6) and (7) adopt a dihedral shape, preferably approximating 90°, so that balls (12) which relate them rest on each of the tracks at two points (13) which are considerably distant form each other, providing two beneficial effects: on one hand the load supported by each ball is distributed among two of its points, and furthermore, the guides related by said balls are prevented from pitching, thereby preventing the door from jolting sideways as well.

[0014] Finally, and according to a further characteristic of the invention, balls (12) are placed between guides (2), (4) and (8) with the aid of cages (14) as shown in figures 3 to 5, or any other similar construction, so that these cages (14) adopt a U-shaped grooved configuration, and are attached by orifices (15) of their intermediate arm to one of the guides, and incorporating on their side arms inner protrusions (16) distributed evenly throughout cage (14) and suitably separated so that they retain balls (12) longitudinally without affecting their normal rolling.

Claims

1. Telescoping guides meant to support locking doors used in railroad cars, of those comprising three segments, an inner segment attached to the car, an intermediate segment, and an outer segment attached to the door, and all of which are related mounted together through sets of balls inserted in corresponding rolling tracks provided on the arms of said segments, **characterised in that** the inner segment (1) meant to be attached to the car structure has an E-shaped configuration, whereby the mid arm (2) thereof is provided with rolling tracks (3) for allowing movement of the intermediate segment (4), said intermediate segment adopting a U-shaped configuration whereby the lateral arms (5) are suitably distanced so that they mate with the intermediate arm of inner segment (1), said lateral arms being provided with internal rolling tracks (6) for connection to the inner segment (1) and with external rolling tracks (7) for connection to the third outer segment (8), said outer segment being meant to receive the door, and being also U-shaped and being mounted on and mating with the intermediate segment (4), whereby the ends of the lateral arms (9) of the outer segment in their maximum approximation position are placed opposite to the lateral arms (10) of the inner segment (1), so that a type of case which is markedly closed and houses within it all the rolling means is constituted whereby, on one hand, manipulation hazards by preventing access of fingers to its interior are eliminated and in addition, depending on the tightness obtained, the entry of foreign elements which may affect its operation is prevented.

2. ª.- Telescoping guides meant to support locking doors used in railroad cars, as claimed in claim 1, **characterised in that** rolling tracks (3), (6) and (7) corresponding to the various guide segments adopt a dihedral arrangement, so that balls (12) rest on said rolling tracks at two points (13) which are considerably distanced from each other.

3. ª.- Telescoping guides meant to support locking doors used in railroad cars, as claimed in above claims, **characterised in that** each set of balls (12) which relates links segments (1 - 4 - 8) of the guide is aided by a U-shaped cage (14) provided in its middle arm with orifices (15) or any other means of attachment to the corresponding guide segment, and is provided on its side arms with inner protrusions (16), evenly distributed and which act as spacers which maintain balls (12) suitable distributed along the corresponding entire segment.

Patentansprüche

1. Teleskopführungen dazu gedacht, ineinandergreifende Türen von Eisenbahnwaggons zu befestigen, von der Art, die über drei Abschnitte verfügen, einen inneren Abschnitt, der an dem Waggon befestigt ist, einen Zwischenabschnitt und einen äusseren Abschnitt, die an der Tür angebracht sind und alle sind verbunden durch einen Satz Kugeln, die in den entsprechenden Rollspuren liegen, die in den Armen der besagten Abschnitte vorgesehen sind, **dadurch gekennzeichnet, dass** die innere Führung (1), die an die Waggonstruktur angebracht wird eine Ausbildung in Form eines "E" annimmt, wobei der mittlere Arm (2) die Rollspuren (3) für den Zwischenabschnitt (4) aufnimmt, die eine "U"-Form annimmt, deren Seitenarme (5) angemessen voneinander entfernt sind, so dass sie den Zwischenarm des inneren Abschnitts (1) einrahmen und umschliessen, wobei die besagten seitlichen Arme über innere Rollspuren (6) verfügen, um den inneren Abschnitt (2) zu verbinden und über äussere Rollspuren (7) zur Verbindung mit dem äusseren Abschnitt (8), die dazu gedacht ist, die Tür aufzunehmen und die auch eine Ausbildung in Form eines "U" annimmt und auf den Zwischenabschnitt (4) aufgesetzt ist, so dass die Enden der seitlichen Arme (9) bei der angenähertsten Position gegenüber den seitlichen Armen (10) des inneren Abschnitts (1) liegen und für letzteren einen praktisch geschlossenen Raum ausbilden, in dessen Inneren alle Rollmittel liegen, so dass die Anordnung zum einen das Risiko bei Wartungsarbeiten beseitigt, da die Finger nicht mehr in das Innere der Führung gelangen können und ausserdem wird in Abhängigkeit von der hermetischen Anordnung verhindert, dass Fremdkörper in das Innere gelangen, die die Funktion behindern könnten.

2. Teleskopführungen dazu gedacht, ineinandergreifende Türen von Eisenbahnwaggons zu befestigen, gemäss Anspruch 1, **dadurch gekennzeichnet, dass** die den verschiedenen Führungsabschnitten entsprechenden Rollspuren (3), (6) und (7) eine winklige Ausbildung annehmen, so dass die Kugeln (12) auf jeder dieser Spuren an zwei Punkten (13) mit beträchtlichem Abstand aufliegen.

3. Teleskopführungen dazu gedacht, ineinandergreifende Türen von Eisenbahnwaggons zu befestigen, gemäss den vorangegangenen Ansprüchen, **dadurch gekennzeichnet, dass** jeder Satz Bälle (12), die die Führungsabschnitte (1-4-8) verbinden, von einem Käfig in U-Form (14) unterstützt wird, dessen mittlerer Arm über Öffnungen (15) verfügt oder andere Mittel zur Befestigung an des entsprechenden Abschnitts und an den Seitenarmen über innere Vorsprünge (16), die gleichmässig verteilt sind und einen angemessenen Abstand wahren, um die Kugeln (12) längs auf dem gesamten Führungsabschnitt festzuhalten.

Revendications

1. Guides télescopiques conçus pour supporter des portes encastrables utilisées dans les wagons de trains, du type comprenant trois tronçons, un segment intérieur fixé au wagon, un tronçon intermédiaire et un tronçon extérieur fixé à la porte, et tous ceux-ci sont montés ensemble à travers des jeux de boules insérés dans les chemins de roulement correspondants pourvus sur les bras desdits tronçons, **caractérisé en ce que** le premier tronçon (1) qui est destiné à être fixé à la structure du wagon a une configuration sous forme de «E», sa branche (2) étant pourvue de chemins de roulement (3) pour le tronçon intermédiaire (4), lequel adopte une configuration sous forme de «U», avec ses branches latérales (5) adéquatement espacées pour encadrer et loger en son sein le bras intermédiaire du tronçon intérieur (1), lesdites branches latérales étant pourvues de chemins de roulement intérieurs (6) pour leur mise en rapport avec le tronçon intérieur (1) et lesdits chemins de roulement extérieurs (7) pour leur mise en rapport avec le tronçon extérieur (8), qui est destiné à recevoir la porte, et qui a aussi une forme de «U» et qui est monté sur le tronçon intermédiaire (4), de manière que les extrémités de ses branches latérales (9) à leur position de proximité maximale son opposées aux branches latérales (10) du tronçon intérieur (1), en établissant avec ce dernier un type de boîtier qui est, sensiblement fermée et qui loge en son sein tous les moyens de roulement, de manière que d'une part l'ensemble élimine les risques de manipulation en faisant impossible l'accès des doigts à l'intérieur et d'autre part, en fonction du degré d'herméticité obtenu, il prévient l'entrée d'éléments étrangers pouvant altérer son fonctionnement.

2. Guides télescopiques conçus pour supporter des portes encastrables utilisées dans les wagons de trains, selon la revendication 1, **caractérisés en ce que** les chemins de roulement (3), (6) et (7) correspondant aux divers guides adoptent une configuration dièdre, de manière que les boules (12) reposent sur lesdits chemins de roulements à deux points (13) qui sont considérablement espacés l'un de l'autre.

3. Guides télescopiques conçus pour supporter des portes encastrables utilisées dans les wagons de trains, selon les revendications précédentes, **caractérisés en ce que** chaque jeu de boules (12) qui unit les tronçons (1 - 4 - 8) du guide est aidé d'une

cage (14) sous forme de «U» pourvue sur sa branche moyenne d'orifices (15) ou de tout autre moyen de fixation au tronçon de guide correspondant, et pourvue sur ses branches latérales de protubérances internes (16), uniformément distribuées et qui agissent comme des espaceurs qui maintiennent les boules (12) dûment distribuées le long de tout le tronçon correspondant.

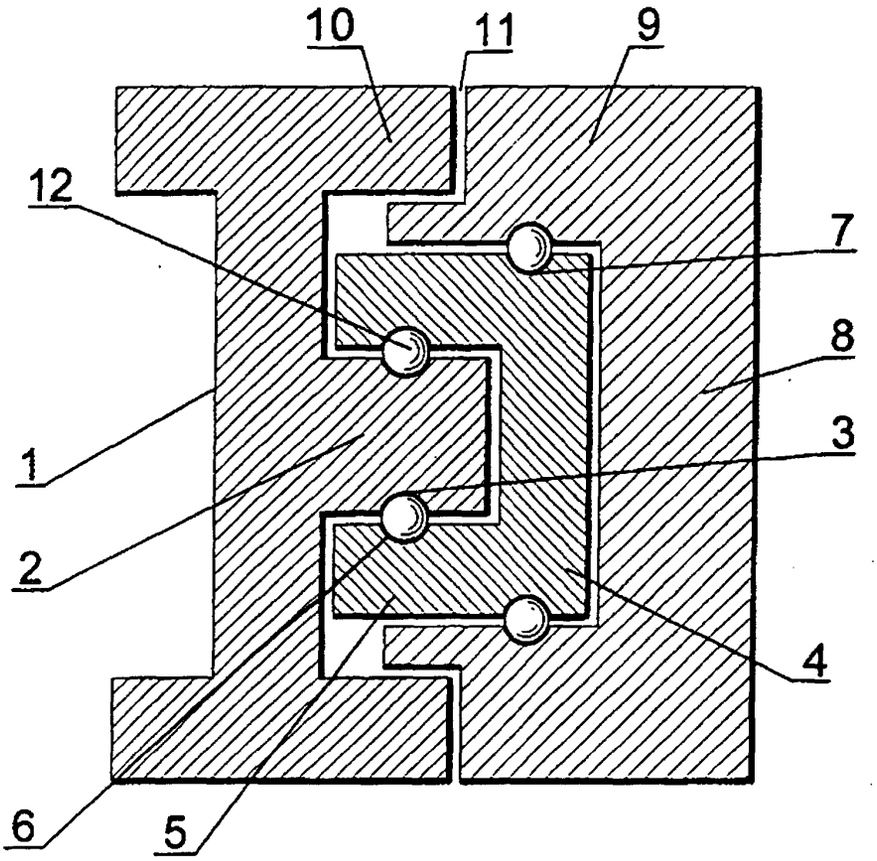

FIG. 1

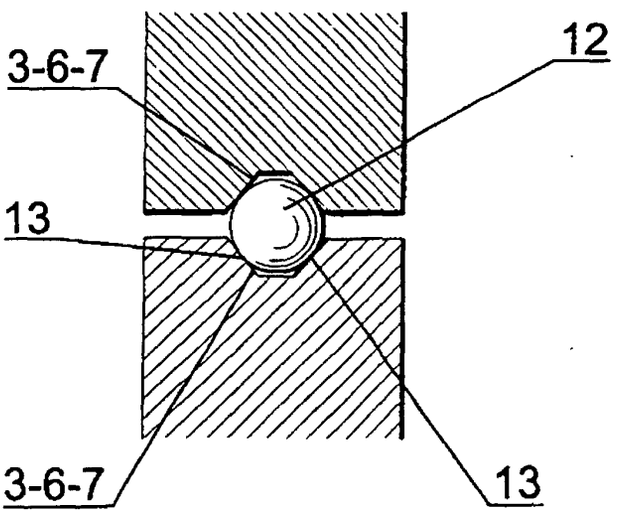

FIG. 2

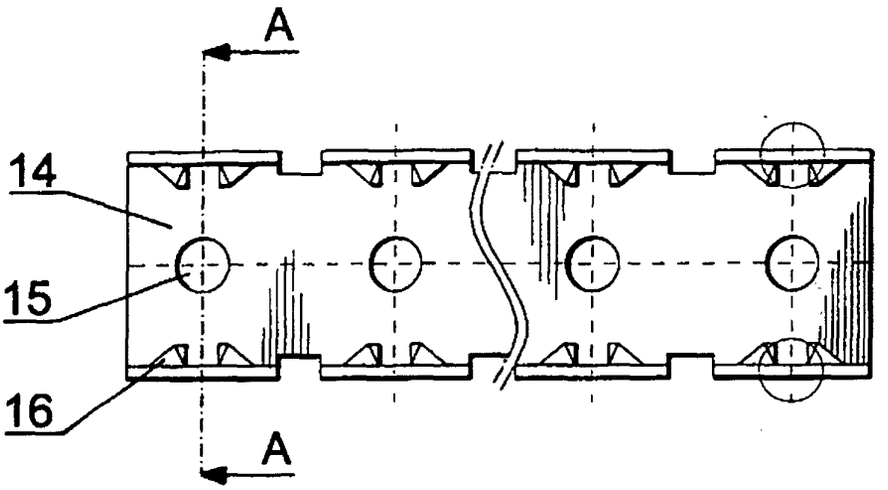

FIG. 3

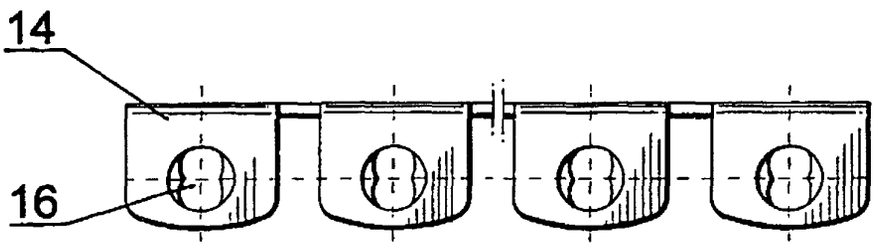

FIG. 4

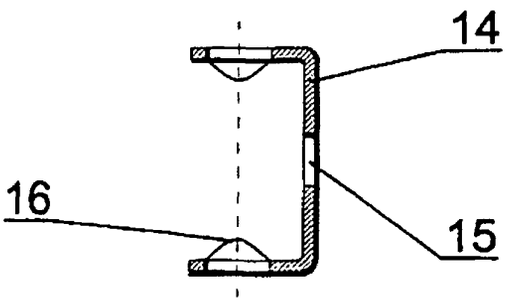

FIG. 5

A-A