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(54) SLIDING ACCESSORY WITH DAMPING DEVICE

(57) The present invention discloses a sliding accessory with a damping device (03), comprising the damping device (03), a sliding mechanism, a spring (05) and a fixed seat. It is suggested that the fixed seat comprises a fixed front seat (01) and a fixed back seat (02). One end of the fixed front seat (01) is provided with a first pulley (011) or a first sliding block (04), and the other end of the fixed front seat (01) is provided with a second pulley (012). A first fastening assembly is placed at the position of the middle of the fixed front seat (01) and close to the first pulley (011) or the first sliding block (04), and/or a first fastening assembly is placed at the position close to the second pulley (012). The fixed back seat (02) is provided with a second fastening assembly matched with the first fastening assembly. A cavity is formed inside the fixed front seat (01) and the fixed back seat (02) after being clamped, and the damping device (03) is placed in the cavity. The present invention intends to provide a sliding accessory with a damping device that possesses simple structure, convenient assembly and reliable performance, while realizing the sliding function and buffering deceleration.

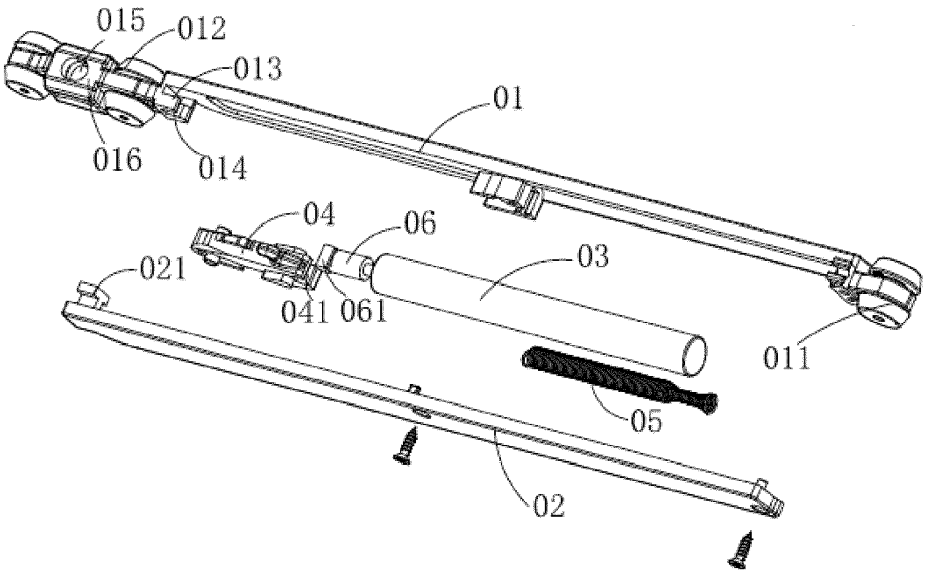

FIG. 2

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a sliding accessory, and particularly relates to a damping device used on a sliding accessory.

BACKGROUND OF THE INVENTION

[0002] Nowadays the sliding door is widely applied to pieces of furniture in general, and how to optimize the sliding effect of a sliding door becomes the main concern of the sliding door manufacturers. The sliding accessory provided with a damping device can realize sliding function and buffering deceleration effect by using pulley and damping device in combination. However, all mounting structures of the damping device and the pulley in the sliding door in the prior art are separated and connected with each other by additional accessories. Hence, structures of existing sliding accessories are sophisticated.

[0003] A partial solution to these drawbacks is known from WO 2009/ 076 785 A1, which discloses a sliding door device for moving a sliding door supported by a moving mechanism in a rail into an end position, and a shell body to move together with the moving mechanism since the shell body is connected with the moving mechanism. However, in the actual use process, the device has several shortcomings as follows: 1) an independent connection accessory is required to connect the shell body with the moving mechanism; 2) the structure of the device is sophisticated, so as to cause a complex and cumbersome assembling process; 3) the connection accessory is easy to loose during the moving process of sliding door, so as to result in the poor stability and poor reliability.

SUMMARY OF THE INVENTION

[0004] In order to overcome the deficiencies in the prior art, the present invention intends to provide a sliding accessory with a damping device that possesses simple structure, convenient assembly and reliable performance, while realizes the sliding function and buffering deceleration.

[0005] In order to achieve the aim, the present invention provides a sliding accessory with a damping device which comprises a damping device, a sliding mechanism, a spring and a fixed seat, wherein the fixed seat comprises a fixed front seat and a fixed back seat. One end of the fixed front seat is provided with a first pulley or a first sliding block, and the other end of the fixed front seat is provided with a second pulley. A first fastening assembly is placed at the position of the middle of the fixed front seat and close to the first pulley or the first sliding block, and/or the first fastening assembly is placed at the position close to the second pulley. The fixed back seat is provided with a second fastening assembly matched with the first fastening assembly. A cavity is formed inside the fixed front seat and the fixed back seat after being clamped, and the damping device is placed in the cavity.

[0006] According to the present invention, the fixed front seat is integrally formed, and the pulleys are directly installed on the fixed front seat. Consequently, the connection portion is not required for the connection between the pulley and the fixed seat, so the whole sliding accessory is simple in structure and convenient to assemble.

[0007] Another better scheme is that the first fastening assembly is a clamping groove or a clamping protrusion, and the second fastening assembly is a clamping protrusion or a clamping groove corresponding to the first fastening assembly. The fixed front seat and the fixed back seat are positioned and clamped through the clamping groove and the clamping protrusion, so that the fixed front seat and the fixed back seat are convenient to assemble and disassemble, and the assembly is convenient.

[0008] Another better scheme is that the cross-section of the clamping protrusion is T-shaped, and the cross-section of the clamping groove is T-shaped. The clamping protrusion of T-shape is clamped into the clamping groove of T-shape. By means of the special clamping mode between the clamping groove and the clamping protrusion, the positioning is more accurate.

[0009] Another better scheme is that the clamping protrusion is composed of two elastic buckles, and the two buckles are arranged oppositely at intervals, and the buckle is a protrusion extending from the fixed back seat or the fixed front seat to the other seat, and a protruding portion is formed on the top of the protrusion towards the outer side. What's more, the two sides of the bottom part of the clamping groove in the up-down direction are provided with recesses for clamping the protruding portions. The protruding portion of the buckle is clamped into the sunken portion, so that the fixed front seat and the fixed back seat can be prevented from falling off; at the same time, the sunken portion can be arranged through the whole bottom of the clamping groove, so as to form two openings in the up-down direction for the protruding portion of the buckle to protrude out, and therefore the detachable function is achieved.

[0010] Another better scheme is that the fixed front seat is provided with a door body connecting assembly at the second pulley. The door body connecting assembly is arranged to enable the pulley assembly to be connected with the door body, so that the linkage effect is achieved.

[0011] Another better scheme is that the door body connecting assembly comprises a through hole formed in the second pulley of the fixed front seat, the inner side of the through hole is provided with threads, which is matched with a connecting screw rod of a door body. The connecting screw rod extends into the through hole to be connected with the second pulley, so that the pulley can be better connected with the sliding door body.

[0012] Another better scheme is that the second pulley is provided with two sets of wheels, and the through holes

are located between the two sets of wheels. By the adoption of the two sets of wheels, the sliding assembly can slide in the guide rail stably.

[0013] Another better scheme is that one end of the fixed front seat is provided with a protruding block, and the through hole is located in the middle of the protruding block, and the two sets of wheels are located at the two ends of the protruding block respectively. The wheels are arranged at the two ends of the protruding blocks, and the through holes are formed in the middle of the protruding blocks, the protruding block is used for forming the through hole, and the strength of the fixed front seat at the through hole can be enhanced, so as that the strength of the door body hung on the pulley component can be enhanced. In addition, the pulley can be firmly installed on the fixed seat, and the pulley is connected with the sliding door body.

[0014] The present invention provides a sliding door mechanism comprises with a rail and a sliding door body, and a sliding accessory with a damping device mentioned above, wherein the sliding accessory slides in the rail, and the sliding accessory is connected with the sliding door body through the door body connecting assembly at the second pulley. The sliding accessory is connected with the sliding door body through the door body connecting assembly, which realizes the synchronous sliding of the sliding accessory and the sliding door.

[0015] Another better scheme is that the sliding door mechanism comprises the connecting screw rod, and the door body connecting assembly comprises a through hole which is formed in the second pulley of the fixed front seat, and threads are arranged on the inner side of the through hole, and one end of the connecting screw rod is matched with the through hole, and the other end of the connecting screw rod is used for hanging the sliding door body. The door body connecting assembly and the connecting screw rod are arranged to firmly connect the pulley assembly with the door body, so that the linkage effect is achieved, and the structure is simple.

[0016] Compared with the prior art, the fixed front seat is integrally formed, and the pulley is directly mounted on the fixed front seat, and the pulley is not required to be installed on the fixed seat through the connecting piece, so that the sliding assembly can achieve sliding and buffered deceleration, while the structure is simple, the assembly is convenient, and the reliability is high.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

FIG. 1 is a schematic diagram of a connection mode between a moving mechanism and a shell body in the prior art;

FIG. 2 is an exploded view of the sliding accessory according to Example 1 of the present invention;

FIG. 3 is a schematic diagram of the sliding accessory according to Example 1 of the present invention;

FIG. 4 is an exploded view of the sliding accessory according to Example 2 of the present invention;

FIG. 5 is an exploded view of the sliding accessory according to Example 3 of the present invention;

DETAILED DESCRIPTION OF ILLUSTRATED EMBODIMENTS

[0018] The left-and-right direction mentioned in present invention is the running direction of the pulley on the rail, the front-back direction mentioned in present invention is perpendicular to the direction of the fixed front seat to the fixed back seat, and the up-down direction is the direction penetrating through the fixed front seat or the fixed back seat.

[0019] The preferred embodiments of the present invention are further described below when taken in connection with the accompanying drawings.

[0020] The present invention provides a sliding accessory with a damping device which comprises a damping device, a sliding mechanism, a spring and a fixed seat, wherein the fixed seat comprises a fixed front seat and a fixed back seat. One end of the fixed front seat is provided with a first pulley or a first sliding block, and the other end of the fixed front seat is provided with a second pulley. The first fastening assembly is placed at the position of the middle of the fixed front seat and close to the first pulley or the first sliding block, and/or the first fastening assembly is placed at the position close to the second pulley. The fixed back seat is provided with a second fastening assembly matched with the first fastening assembly. A cavity is formed inside the fixed front seat and the fixed back seat after being clamped, and the damper is placed in the cavity.

[0021] In the present invention, the fixed front seat is integrally formed, and the pulley is directly mounted on the fixed front seat, and the pulley is not required to be installed on the fixed seat through the connecting piece, so that the sliding assembly can achieve sliding and buffered deceleration, while the structure is simple, the assembly is convenient, and the reliability is high.

[0022] As shown in FIG. 1, the moving assembly 09 and the shell body 017 in the prior art are separated, and a special connecting assembly required to achieve connection, and the structure is complex, and the assembling process for the sliding accessory is complicated. The present invention provides a solution to get the questions mentioned above avoided effectively.

[0023] In order to make the objectives, features and advantages of the present invention comprehensible, the preferred embodiments of the present invention are described below in detail with reference to the accompanying drawings.

Example 1

[0024] In example 1, as shown in FIG. 2 and FIG. 3, an exploded view and a combined diagram of a sliding accessory with a damping device are shown. The sliding accessory comprises a fixed front seat 01, a fixed back seat 02, a damping device 03, a sliding block 04 and a spring 05; one end of the fixed front seat 01 is provided with a first pulley 011, and the other end of the fixed front seat 01 is provided with a second pulley 012; the first fastening assembly is arranged at the position of the middle of the fixed front seat 01 and close to the second pulley 012; the fixed back seat 02 is provided with the second fastening assembly matched with a clamping assembly 013; a cavity is formed inside the fixed front seat 01 and the fixed back seat 02 after being clamped, and the damping device 03 is placed in the cavity.

[0025] The sliding block 04 is connected with a spring 05, a connecting rod 06 is connected to the damping device 03, and the connecting rod comprises a connecting portion and a rod portion, the rod portion extends into the damping device 03, and the connecting portion is provided with a cylindrical connecting block 061; a cylindrical clamping hole 041 is formed in one end of the sliding block 04, the cylindrical clamping hole 041 is clamped with the cylindrical connecting block 061 of the connecting rod 06, and therefore the connecting rod is connected with the sliding block 04. The middle of the up-down directions of the fixed base is provided with a sliding groove in the horizontal direction, and the sliding groove is close to the second pulley; the sliding groove extends downwards to form a hook portion, protrusions are arranged on the two sides of the sliding block and are hung on the sliding grooves, and the sliding blocks slide along the sliding grooves. When the sliding block slides in the direction of the second pulley, the sliding block drives the connecting rod to pull out of the damping device and stretch the spring; when the protrusions on the two sides of the sliding block reach the hook portion of the sliding groove, the sliding block stops; when the bulge on the side edge of the sliding block slides out of the hook portion, the retraction force of the spring drives the sliding block to slide in the direction of the first pulley, and at the moment, the rod portion of the connecting rod is retracted into the damping device, the speed of retraction of the spring can be slowed down by the damping device, and therefore the function of buffering deceleration is achieved.

[0026] In this example, as shown in FIG. 1, the first fastening assembly is a clamping groove 013, and the second fastening assembly is a clamping protrusion 021 corresponding to the clamping groove of the first fastening assembly. For the fastening assembly, the clamping connection mode is adopted, and other connection modes such as riveting, welding and the like are also feasible and should be within the protection scope of the present invention. When a clamping connection mode is adopted, the priorities of being easy to assemble and disassemble and convenient to assemble are enhanced.

[0027] A clamping groove 013 is formed at the position of the middle of the fixed front seat 01 and close to the second pulley 012; a clamping protrusion 021 is arranged on the fixed seat 02 at the corresponding position to the clamping groove 013. Therefore one end of the fixed front seat close to the second pulley 012 and the fixed back seat are clamped and positioned through the clamping groove 013 and the clamping protrusion 021, and the middle of the fixed front seat 01 and the middle part of the fixed back seat 02 are fixed and connected through screws; one end close to the first pulley 11 of the fixed front seat 01 and one end close to the first pulley 11 of the fixed back seat 02 are fixed and connected through screws.

[0028] In this example, the clamping protrusion 021 is a protrusion with a T-shaped cross-section in the up-down direction, and the clamping groove 013 extends from the fixed front seat to the fixed back seat, and the clamping groove 013 is a groove with a T-shaped cross-section, the clamping groove 013 is provided with a U-shaped clamping portion 014, and a gap is reserved between the U-shaped clamping portion 014 and the fixed front seat 01, and the width of the gap is slightly larger than the width of the transverse part of the T-shaped protrusion; the transverse part of the T-shaped protrusion is clamped in a gap between the clamping portion and the fixed front seat, the vertical part of the T-shaped protrusion is clamped into the opening of the U-shaped clamping portion.

[0029] The fixed front seat 01 is provided with a door body connecting assembly at the second pulley 012. The door body connecting assembly is arranged to enable the pulley assembly to be connected with the door body, so that the linkage effect is achieved.

[0030] The fixed front seat 01 is provided with a through hole 015 at the position of second pulley 012 for being connected with the sliding door body. A threaded hole is set in the inner side of the through hole and it is matched with a connecting screw rod of the hanging door body. The connecting screw rod extends into the through hole to connect with the second pulley, so that the pulley assembly can steadily connect with the sliding door body.

[0031] The second pulley 012 is provided with two sets of wheels, the through hole 015 is located between the two sets of wheels, and the first pulley 11 is provided with a set of wheels. By the adoption of the two sets of wheels, the sliding assembly can slide in the guide rail stably.

[0032] One end of the fixed front seat 01 is provided with a protruding block 016, the through hole 015 is located in the middle of the protruding block 016, and the two sets of wheels are located at the two ends of the protruding block 016 respectively. The wheels are arranged at the two ends of the protruding block 016, and the through holes are set in the middle of the protruding block 016, the protruding block 016 is used for forming the through hole, and the strength of the fixed front seat at the through hole can be enhanced, and the strength

of the door body hung on the pulley component can be enhanced. In addition, the pulley can be firmly installed on the fixed seat, and the pulley is connected with the sliding door body.

[0033] A sliding door comprises a rail and a sliding door body, and comprises the sliding accessory with the damping device mentioned above, slides in the rail, and the sliding accessory is connected with the sliding door body through a door body connecting assembly at the second pulley. The sliding accessory is connected with the sliding door body by the connecting assembly, so as that synchronous sliding of the sliding accessory and the connecting assembly in the rail is realized.

[0034] The sliding door mechanism further comprises a connecting screw rod, and the door body connecting assembly comprises a through hole which is formed in a second pulley of the fixed front seat, threads are set on the inner side of the through hole, and one end of the connecting screw rod is matched with the through hole, and a sliding door body is hung at the other end of the connecting screw rod. The door body connecting assembly and the connecting screw rod are arranged to well connect the pulley assembly with the door body, so that the linkage effect is achieved, and the structure is simple.

Example 2

[0035] As shown in FIG. 4, in this example, and the two ends of the fixed front seat 01 and the two ends of the fixed back seat 02 are clamped and positioned through a clamping connection mode, and the middle parts of the fixed front seat and the fixed back seat are fixed and connected through screws.

[0036] The clamping groove 013 at one end of the fixed front seat 01 close to the second pulley 012 is a groove with a T-shaped section, and is provided with a U-shaped clamping portion 014, and a gap is reserved between the U-shaped clamping portion 014 and the fixed front seat 01, and the width of the gap is just equal to the transverse part of the T-shaped protrusion, the transverse part of the T-shaped protrusion is clamped into the gap between the U-shaped clamping portion 014 and the fixed front seat 01, and the clamping protrusion 021 of the corresponding fixed back seat 02 is a protrusion with a T-shaped cross-section in the vertical direction, and the vertical part of the T-shaped protrusion is clamped into the opening of the U-shaped clamping portion 014.

[0037] The clamping protrusion at the corresponding position, close to the first pulley 11 of the fixed back seat 02 and the fixed front seat 01, is composed of two elastic clamping buckles 022, and the two clamping buckles 022 are oppositely arranged, and a gap is reserved in the middle of the two clamping buckles 022; the clamping buckle 022 is a protrusion which extends towards the direction of the fixed front seat 01 towards fixed the back seat 02, and a protruding portion 023 is formed on the top of the protrusion towards the outer side, and the cross-section of the protruding portion 023 is a right-angled trapezoid shape, and the right-angled trapezoid shaped protruding portion 023 is provided with a slope extending towards the direction of the fixed back seat; a clamping hole 017 is set close to one end of the first pulley 011 of the fixed front seat 01 and the hole diameter of the clamping hole 017 is smaller than the distance between the two elastic buckling protruding portions 023, and an opening 018 is set in the upper side face and the lower side face of the clamping groove, when the clamping protrusion is clamped into the clamping hole 017, the protruding portion 023 of the buckle 022 protrudes out of the opening 018; when the two protruding portions 023 are pushed to the middle of the clamping hole, the disassembly function can be realized, and openings set in the two side faces of the clamping groove is convenient for disassembly.

Example 3

[0038] As shown in FIG. 5, in this example, and the two ends of the fixed front seat 01 and the two ends of the fixed back seat 02 are clamped and positioned through a clamping connection mode, and the middle parts of the fixed front seat and the fixed back seat are fixed and connected through screws.

[0039] The clamping protrusions at the two ends of the fixed back seat 02 are composed of two elastic clamping buckles 022, and the two clamping buckles 022 are oppositely arranged, and a gap is reserved in the middle of the two clamping buckles 022; the clamping buckle 022 is a protrusion which extends towards the direction of the fixed front seat 01 towards fixed the back seat 02, and a protruding portion 023 is formed on the top of the protrusion towards the outer side, and the cross-section of the protruding portion 023 is a right-angled trapezoid shape, and the right-angled trapezoid shaped protruding portion 023 is provided with a slope extending towards the direction of the fixed back seat; a clamping hole 017 is set two ends of the fixed front seat 01 and the hole diameter of the clamping hole 017 is smaller than the distance between the two elastic buckling protruding portions 023, and an opening 018 is set in the upper side face and the lower side face of the clamping groove, when the clamping protrusion is clamped into the clamping hole 017, the protruding portion 023 of the buckle 022 protrudes out of the opening 018; when the two protruding portions 023 are pushed to the middle of the clamping hole 017, the disassembly function can be realized, and openings set in the two side faces of the clamping groove is convenient for disassembly.

[0040] In the examples above, the first pulley 011, which is mounted at one end of the fixed front seat 01, can be replaced with a first sliding block, and the first sliding block is a sliding block pair. After the fixed front seat 01 and the fixed back seat 02 are clamped and positioned, the fixed front seat 01 and the fixed back seat 02 can be riveted through screws, welding, bonding and the like, or only a clamping assembly is adopted.

[0041] We have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention. In addition, although some specific terms are used in this specification, but the terms are only used for convenience and do not make any limitation on the invention.

Claims

1. A sliding accessory with a damping device (03), comprising:

   the damping device (03), a sliding mechanism, a spring (05) and a fixed seat, **characterized in that**
   the fixed seat comprises a fixed front seat (01) and a fixed back seat (02), one end of the fixed front seat (01) is provided with a first pulley (011) or a first sliding block (04), and the other end of the fixed front seat (01) is provided with a second pulley (012);
   a first fastening assembly is placed at the position of the middle of the fixed front seat (01) and close to the first pulley (011) or the first sliding block (04), and/or a first fastening assembly is placed at the position close to the second pulley (012);
   the fixed back seat (02) is provided with a second fastening assembly matched with the first fastening assembly;
   a cavity is formed inside the fixed front seat (01) and the fixed back seat (02) after being clamped, and the damping device (03) is placed in the cavity.

2. The sliding accessory with a damping device (03) as claimed in claim 1, wherein the first fastening assembly is a clamping groove (013) or a clamping protrusion (021), and the second fastening assembly is a clamping protrusion (021) or a clamping groove (013) corresponding to the first fastening assembly.

3. The sliding accessory with a damping device (03) as claimed in claim 2, wherein the cross-section of the clamping protrusion (021) is T-shaped, and the cross-section of the clamping groove (013) is T-shaped, the clamping protrusion (021) of T-shape is clamped into the clamping groove (013) of T-shape.

4. The sliding accessory with a damping device (03) as claimed in claim 2, wherein the clamping protrusion (021) is composed of two elastic buckles (022), and the two buckles (022) are arranged oppositely at intervals, and each buckle (022) is a protrusion extending from the fixed back seat (02) or the fixed front seat (01) to the other seat (01; 02), and a protruding portion (023) is formed on the top of the protrusion towards the outer side, and the two sides of the bottom part of the clamping groove (013) in the up-down direction are provided with recesses for clamping the protruding portions (023).

5. The sliding accessory with a damping device (03) as claimed in any one of claims 1-4, wherein the fixed front seat (01) is provided with a door body connecting assembly at the second pulley (012).

6. The sliding accessory with a damping device (03) as claimed in claim 5, wherein the door body connecting assembly comprises a through hole (015) formed in the second pulley (012) of the fixed front seat (01), and the inner side of the through hole (015) is provided with threads, which are matched with a connecting screw rod (06) of a door body.

7. The sliding accessory with a damping device (03) as claimed in claim 6, wherein the second pulley (012) is provided with two sets of wheels, and the through hole (15) is located between the two sets of wheels.

8. The sliding accessory with a damping device (03) as claimed in claim 7, wherein one end of the fixed front seat (01) is provided with a protruding block (016), and the through hole (015) is located in the middle of the protruding block (016), and the two sets of wheels are located at the two ends of the protruding block (016), respectively.

9. A sliding door mechanism provided with a rail and a sliding door body, **characterized by**
   a sliding accessory with a damping device (03) as claimed in any one of claims 5-8, wherein the sliding accessory slides in the rail, and the sliding accessory is connected with the sliding door body through the door body connecting assembly.

10. The sliding door mechanism as claimed in claim 9, wherein the sliding accessory is connected with the sliding door body through the door body connecting assembly at the second pulley (012).

11. The sliding door mechanism as claimed in claim 9 or 10, wherein the sliding door mechanism further comprises a connecting screw rod (06), and the door body connecting assembly comprises a through hole (015) and threads are arranged on the inner side of the through hole (015), and one end of the connecting screw rod (06) is matched with the through hole (015).

12. The sliding door mechanism as claimed in claim 11, wherein the through hole (015) is formed in the second pulley (012) of the fixed front seat (01).

13. The sliding door mechanism as claimed in claim 11 or 12, wherein the other end of the connecting screw rod (06) opposite to the end matched with the through hole (015) is used for hanging the sliding door body.

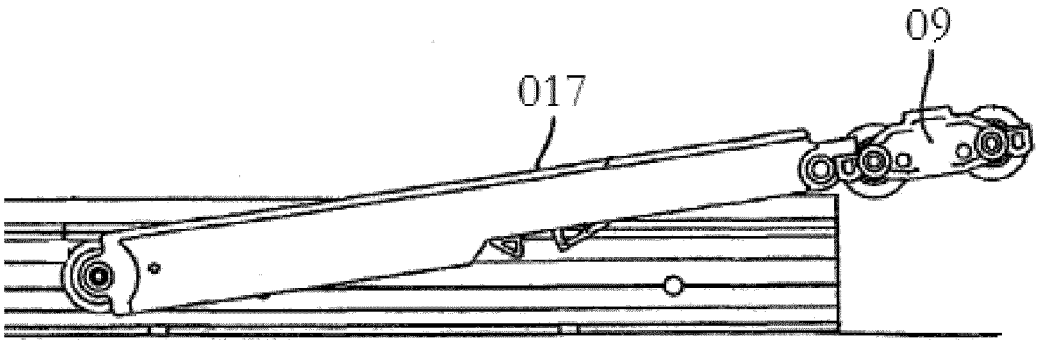

FIG. 1

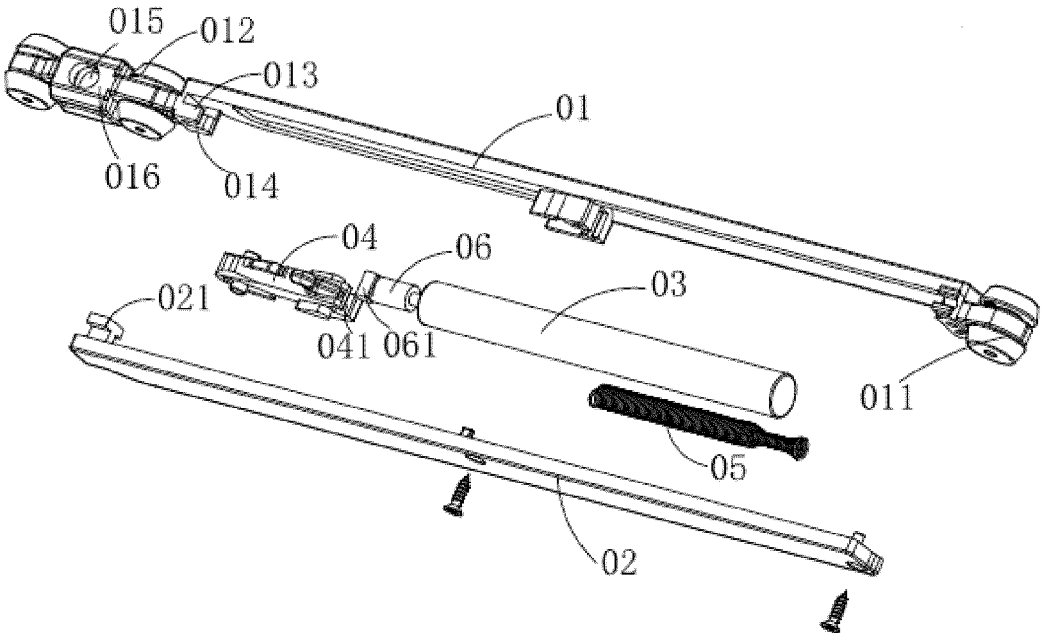

FIG. 2

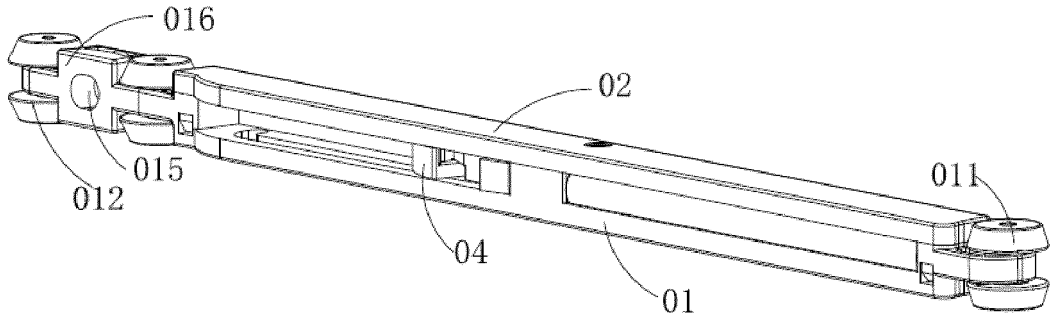
016
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FIG. 3

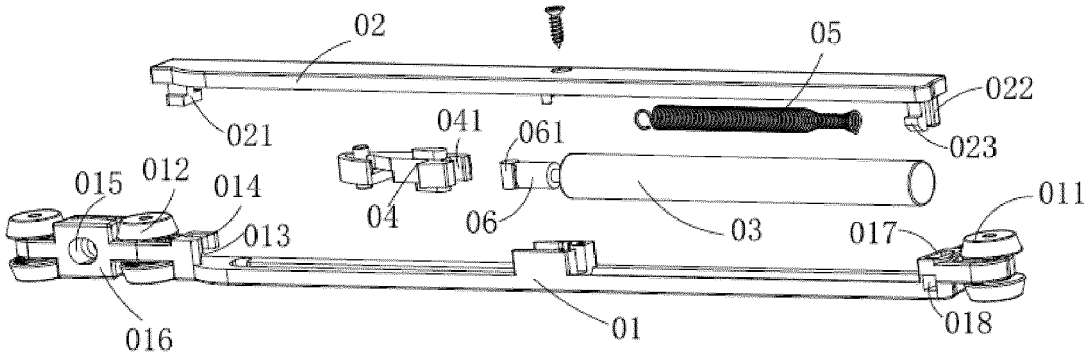
02
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FIG. 4

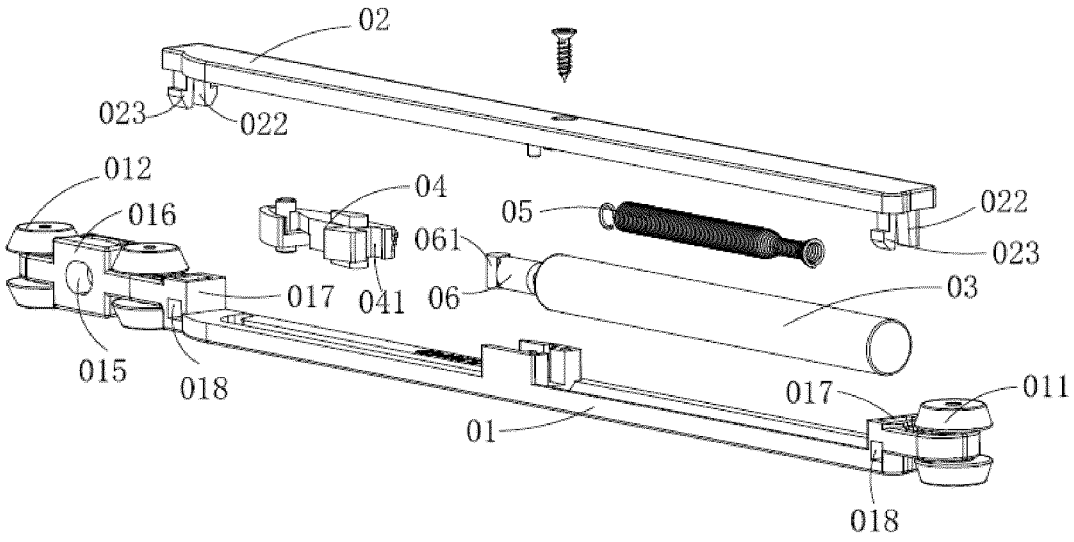
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FIG. 5

Europäisches Patentamt
European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 18 16 9738

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	CN 201 843 427 U (DUNSHENG ZHAN) 25 May 2011 (2011-05-25) * figures 1,2,3,9 *	1,5-13 2,3	INV. E05F5/00 E05D15/06 E05F1/16
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Y	EP 3 045 075 A1 (GEZE GMBH [DE]) 20 July 2016 (2016-07-20) * paragraph [0039]; figure 5 *	2,3	
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A	EP 3 095 941 A1 (TAMAR S R O [CZ]) 23 November 2016 (2016-11-23) * abstract; figure 2 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

E05F
E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 October 2018	Witasse-Moreau, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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