



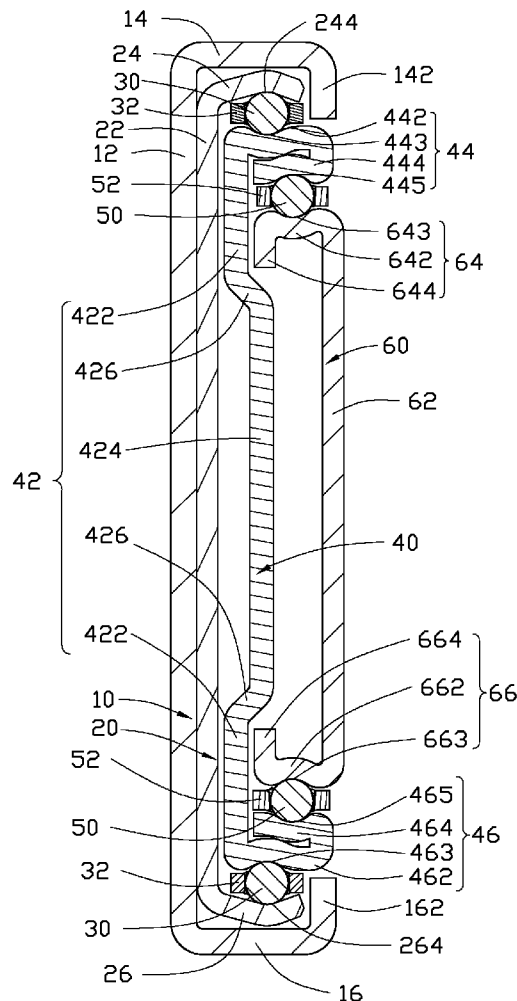
US 20120087604A1

(19) **United States**(12) **Patent Application Publication**
YU et al.(10) **Pub. No.: US 2012/0087604 A1**(43) **Pub. Date: Apr. 12, 2012**(54) **SLIDE RAIL FOR RACK SEVER****Publication Classification**(75) Inventors: **MO-MING YU**, Shenzhen City
(CN); **ZE-HONG CHEN**,
Shenzhen City (CN)(51) **Int. Cl.**
A47B 88/10 (2006.01)(52) **U.S. Cl.** **384/18**(73) Assignees: **HON HAI PRECISION**
INDUSTRY CO., LTD., Tu-Cheng
(TW); **HONG FU JIN**
PRECISION INDUSTRY
(ShenZhen) CO., LTD., Shenzhen
City (CN)(57) **ABSTRACT**

A slide rail includes an outer slide bracket, an outer slide, a middle slide, an inner slide, a plurality of first ball bearings, a first ball bearing bracket, a plurality of second ball bearings and a second ball bearing bracket. The outer slide is received in the outer slide bracket. The middle slide is received in the outer slide. The inner slide is received in the middle slide. The plurality of first ball bearings and the first ball bearing bracket are positioned between the outer slide and the middle slide. The first ball bearing bracket holds the first ball bearings. The plurality of second ball bearings and the second ball bearing bracket are positioned between the middle slide and the inner slide. The second ball bearing bracket holds the second ball bearings.

(21) Appl. No.: **12/954,660**(22) Filed: **Nov. 25, 2010**(30) **Foreign Application Priority Data**

Oct. 12, 2010 (CN) 201010504159.9



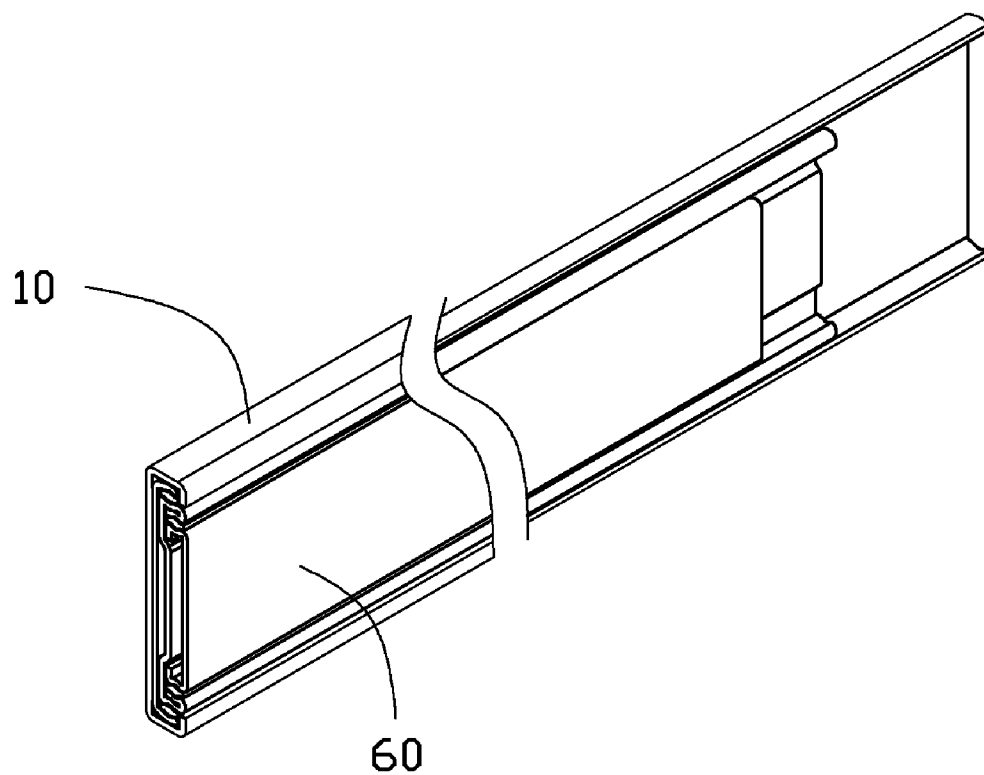


FIG. 1

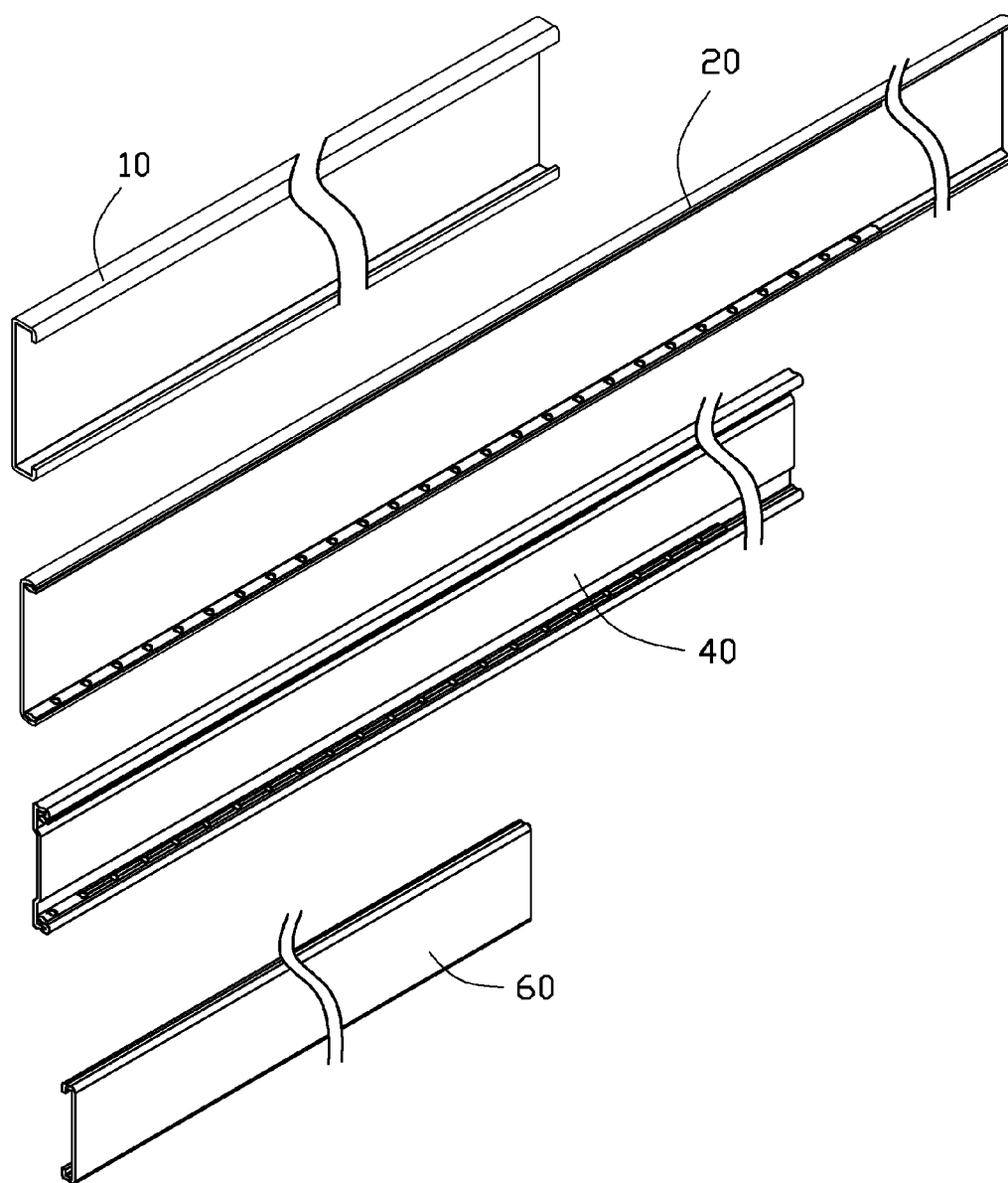
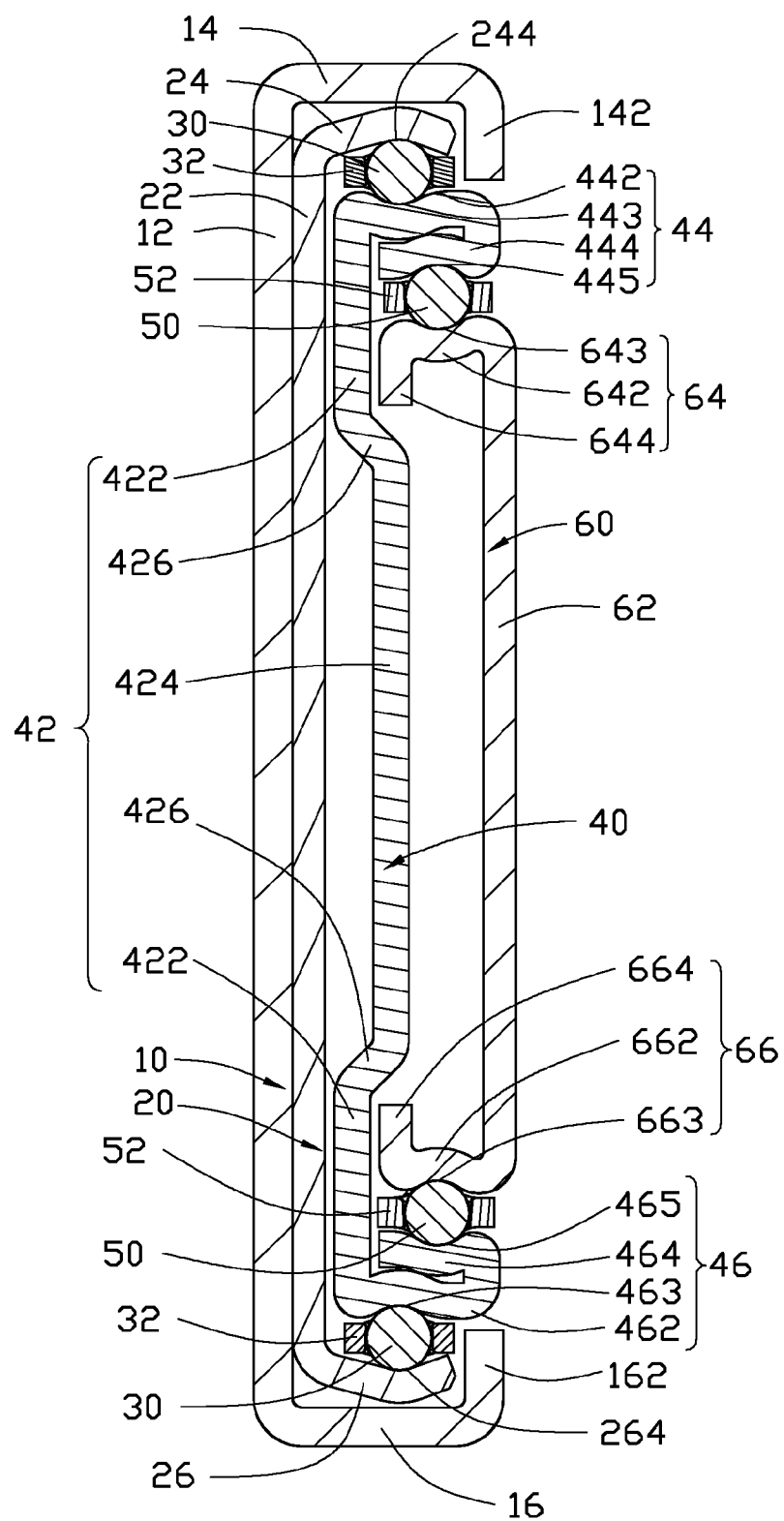


FIG. 2



SLIDE RAIL FOR RACK SEVER

BACKGROUND

[0001] 1. Technical Field

[0002] The present disclosure relates to device mounting, and particularly, to a slide rail for mounting a sever to a server rack.

[0003] 2. Description of Related Art

[0004] A typical slide rail for mounting a server to a rack includes a first slide mounted to the rack and a second slide mounted to the server. The second slide is extendable relative to the first slide, so that the server can be extended from the rack. However, when the server is extended from the rack, the server may be damaged due to insufficient support strength between the first slide and the second slide.

[0005] Therefore, a slide rail is desired to overcome the limitations described.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Many aspects of the disclosure can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the present apparatus. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

[0007] FIG. 1 is an assembled, isometric view of a slide rail according to an exemplary embodiment.

[0008] FIG. 2 is an exploded, isometric view of FIG. 1.

[0009] FIG. 3 is a cross-section of FIG. 1.

DETAILED DESCRIPTION

[0010] Referring to FIGS. 1-3, a slide rail in accordance with an exemplary embodiment includes an outer slide bracket 10, an outer slide 20, a middle slide 40, and an inner slide 60. The outer slide bracket 10 is fixed to a stable surface, such as a server rack. The inner slide 60 can be fixed on a movable object, such as a server to be installed in the rack. The outer slide 20 is received in the outer slide bracket 10. The middle slide 40 is received in the outer slide 20 between the outer slide 20 and the inner slide 60. The outer slide 20, the middle slide 40, and the inner slide 60 are movable relative to the outer slide bracket 10. Through the motion between the three slides 20, 40, 60 and the outer slide bracket 10, the movable object can be pushed into or pulled out from the stable object. A plurality of first ball bearings 30 and a first ball bearing bracket 32 are positioned between the outer slide 20 and the middle slide 40. The plurality of first ball bearings 30 eases movement between the outer slide 20 and the middle slide 40, and the first ball bearing bracket 32 fixes the plurality of first ball bearings 30 therein. A plurality of second ball bearings 50 and a second ball bearing bracket 52 are positioned between the middle slide 40 and the inner slide 60. The plurality of second ball bearings 50 eases movement between the middle slide 40 and the inner slide 60, and the second ball bearing bracket 52 fixes the plurality of second ball bearings 50 therein.

[0011] The outer slide bracket 10 includes a bottom wall 12 and two sidewalls 14, 16 extending from two edges of the bottom wall 12. Ends 142 and 162 of the two sidewalls 14 and 16 are respectively turned inward to be parallel with the bottom wall 12 and opposite to each other. The two sidewalls

14, 16 and the bottom wall 12 cooperatively define a receiving space receiving the outer slide 20 therein.

[0012] The outer slide 20 includes a first main plate 22, a first top side part 24, and a first bottom side part 26. The two first side parts 24 and 26 are symmetrically disposed on two opposite sides of the first main plate 22, integrally extending from the first main plate 22 respectively. The two first side parts 24 and 26 are substantially V-shaped. At each inner side of the two first side parts 24 and 26, first recesses 244, 264 are formed respectively.

[0013] The middle slide 40 includes a second main plate 42, a second top side part 44, and a second bottom side part 46. The two second side parts 44 and 46 are symmetrically disposed on two opposite sides of the second main plate 42, integrally extending from the second main plate 42 respectively.

[0014] The second main plate 42 includes a pair of end portions 422, a flat panel 424, and a pair of connection portions 426. The end portions 422 are disposed on two edges of the flat panel 424 and parallel with the flat panel 424 respectively. The connection portions 426 connect the pair of end portions 422 and the flat panel 424 at two edges of the flat panel 424, respectively. The connection portions 426 are symmetrically inclined to the flat panel 424.

[0015] The two second side parts 44 and 46 have symmetrically the same structure, so the second bottom side part 46 is mainly described below for simplicity. The second bottom side part 46 includes a first curve 462, and a second curve 464. The first curve 462 is extended from the end portion 422 of the main plate 42. The second curve 464 is extended inward from a distal end of the first curve 462 and superposed to the first curve 462. The first curve 462 is substantially V-shaped. At outer side of the first curve 462, a second recess 463 is formed. The second curve 464 is substantially V-shaped. At inner side of the second curve 464, a third recess 465 is formed.

[0016] Similarly, the second top side part 44 includes a first curve 442, and a second curve 444. The first curve 442 is substantially V-shaped. A second recess 443 is formed at the outer side of the first curve 442. The second curve 444 is substantially V-shaped. At the inner side of the second curve 444, a third recess 445 is formed.

[0017] The inner slide 60 includes a third main plate 62, a third top side part 64, and a third bottom side part 66. The two third side parts 64 and 66 are symmetrically disposed on two opposite sides of the third main plate 62, integrally extending from the third main plate 62 respectively. The third main plate 62 can be fixed to the movable object when in use.

[0018] The third top side part 64 includes a curved portion 642 extending from a top edge of the third main plate 62, and a free end 644 turning inward to be generally parallel with the third main plate 62. The curved portion 642 is substantially V-shaped. At outer side of the curved portion 642, a fourth recess 643 is formed.

[0019] Similarly, the third bottom side part 66 includes a curved portion 662 extending from a bottom edge of the third main plate 62, and a free end 664 turning inward to be generally parallel with the third main plate 62. The curved portion 662 is substantially V-shaped. At the outer side of the curved portion 662, a fourth recess 663 is formed. The two free ends 664 and 644 enhance structural strength of the inner slide 60.

[0020] In assembly of the inner slide 60 to the middle slide 40, the inner slide 60 is received between the two second side parts 44 and 46 of the middle slide 40. The plurality of second ball bearings 50 is received between the fourth recess 643 of

the third top side part **64** and the third recess **445** of the second top side part **44**, and between the fourth recess **663** of the third bottom side part **66** and the third recess **465** of the second bottom side part **46**.

[0021] In assembly of the middle slide **40** to the outer slide **20**, the middle slide **40** is received between the two first side parts **24** and **26** of the outer slide **20**. The plurality of first ball bearings **30** is received between the first recess **244** of the first side part **24** and the second recess **443** of the second top side part **44**, and between the first recess **264** of the first bottom side part **26** and the second recess **463** of the second bottom side part **46**.

[0022] In assembly of the outer slide **20** to the outer slide bracket **10**, the outer slide **20** is received between the two sidewalls **14** and **16** of the outer slide bracket **10**. The ends **142** and **162** of the two sidewalls **14** and **16** respectively abut the two first side parts **24** and **26** of the outer slide **20** to maintain the outer slide **20** received between the two sidewalls **14** and **16**, and the ends **142** and **162** enhance structural strength of the outer slide bracket **10**.

[0023] While the disclosure has been described by way of example and in terms of the embodiments, it is to be understood that the invention is not limited thereto. To the contrary, it is intended to cover various modifications and similar arrangements as would be apparent to those skilled in the art. Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:

1. A slide rail comprising:
 - an outer slide bracket comprising a bottom wall and two sidewalls extending from two edges of the bottom wall, wherein each of the two sidewalls comprises an end turned inward to be parallel with the bottom wall;
 - an outer slide received in the outer slide bracket;
 - a middle slide received in the outer slide;
 - an inner slide received in the middle slide;
 - a plurality of first ball bearings and a first ball bearing bracket positioned between the outer slide and the middle slide, the first ball bearing bracket holding the first ball bearings; and
 - a plurality of second ball bearings and a second ball bearing bracket positioned between the middle slide and the inner slide, the second ball bearing bracket holding the second ball bearings.
2. The slide rail of claim 1, wherein the outer slide comprises a first main plate, a first top side part, and a first bottom side part, and wherein the first top side part and the first

bottom side part are symmetrically positioned on two opposite sides of the first main plate, integrally extending from the first main plate respectively.

3. The slide rail of claim 2, wherein the first top side part and the first bottom side part are substantially V-shaped, and at each inner side of the first top side part and the first bottom side part, first recesses are defined respectively.

4. The slide rail of claim 3, wherein the middle slide comprises a second main plate, a second top side part, and a second bottom side part, and wherein the second top side part and the second bottom side part are symmetrically positioned on two opposite sides of the second main plate, integrally extending from the second main plate respectively.

5. The slide rail of claim 4, wherein each of the second top side part and the second bottom side part comprises a first curve, and a second curve, and wherein the first curve is extended from the main plate, and the second curve is extended inward from a distal end of the first curve and superposed to the first curve.

6. The slide rail of claim 5, wherein the first curve is substantially V-shaped, and at outer side of the first curve, a second recess is defined, and wherein the second curve is substantially V-shaped, and at inner side of the second curve, a third recess is defined.

7. The slide rail of claim 6, wherein the first ball bearings and the first ball bearing bracket are positioned between the first recesses and the second recesses.

8. The slide rail of claim 7, wherein the inner slide comprises a third main plate, a third top side part, and a third bottom side part, and wherein the third top side part and the third bottom side part are symmetrically positioned on two opposite sides of the third main plate, integrally extending from the third main plate respectively.

9. The slide rail of claim 8, wherein each of the third top side part and the third bottom side part comprises a curved portion extending from a top edge of the third main plate, and a free end turning inward to be generally parallel with the third main plate.

10. The slide rail of claim 9, wherein the curved portion is substantially V-shaped, and at outer side of the curved portion, a fourth recess is defined.

11. The slide rail of claim 10, wherein the second ball bearings and the second ball bearing bracket are positioned between the third recesses and the fourth recesses.

* * * * *