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(54) **DRAWER ADJUSTING MECHANISM**

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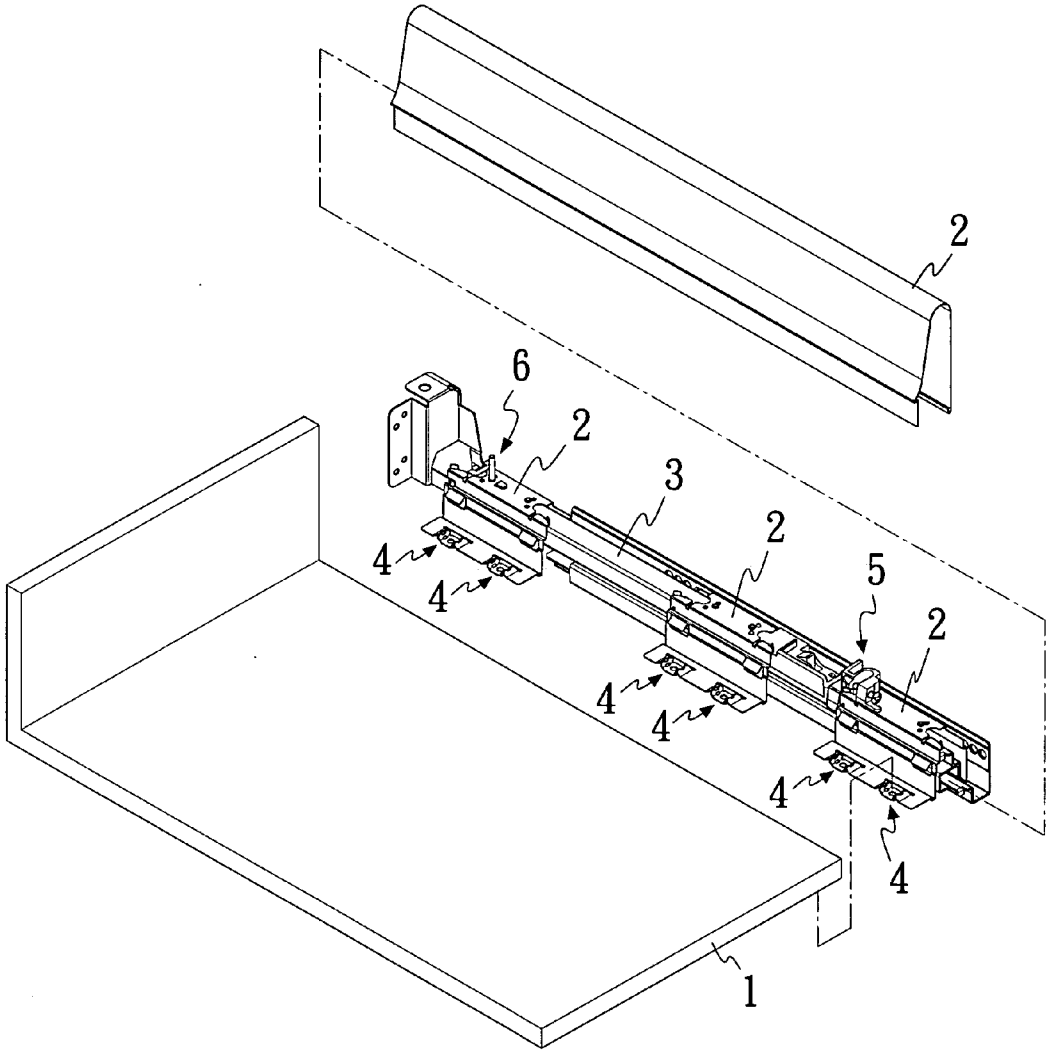
(57) **ABSTRACT**

A drawer adjusting mechanism is able to adjust dimensional errors of a drawer, so that the drawer may be accurately mounted and smoothly slide on two rails of the drawer. The drawer adjusting mechanism includes a drawer bottom level adjusting mechanism adapted to adjust any error in the drawer bottom level caused by errors in the thickness and dimensions of the drawer bottom, a drawer sliding direction adjusting mechanism adapted to adjust any error in the sliding direction of the drawer caused by a drawer front panel not centered at a front end of a drawer box, and a drawer slope adjusting mechanism adapted to adjust any axial slope of the drawer to enable smooth sliding of the drawer along the rails thereof.



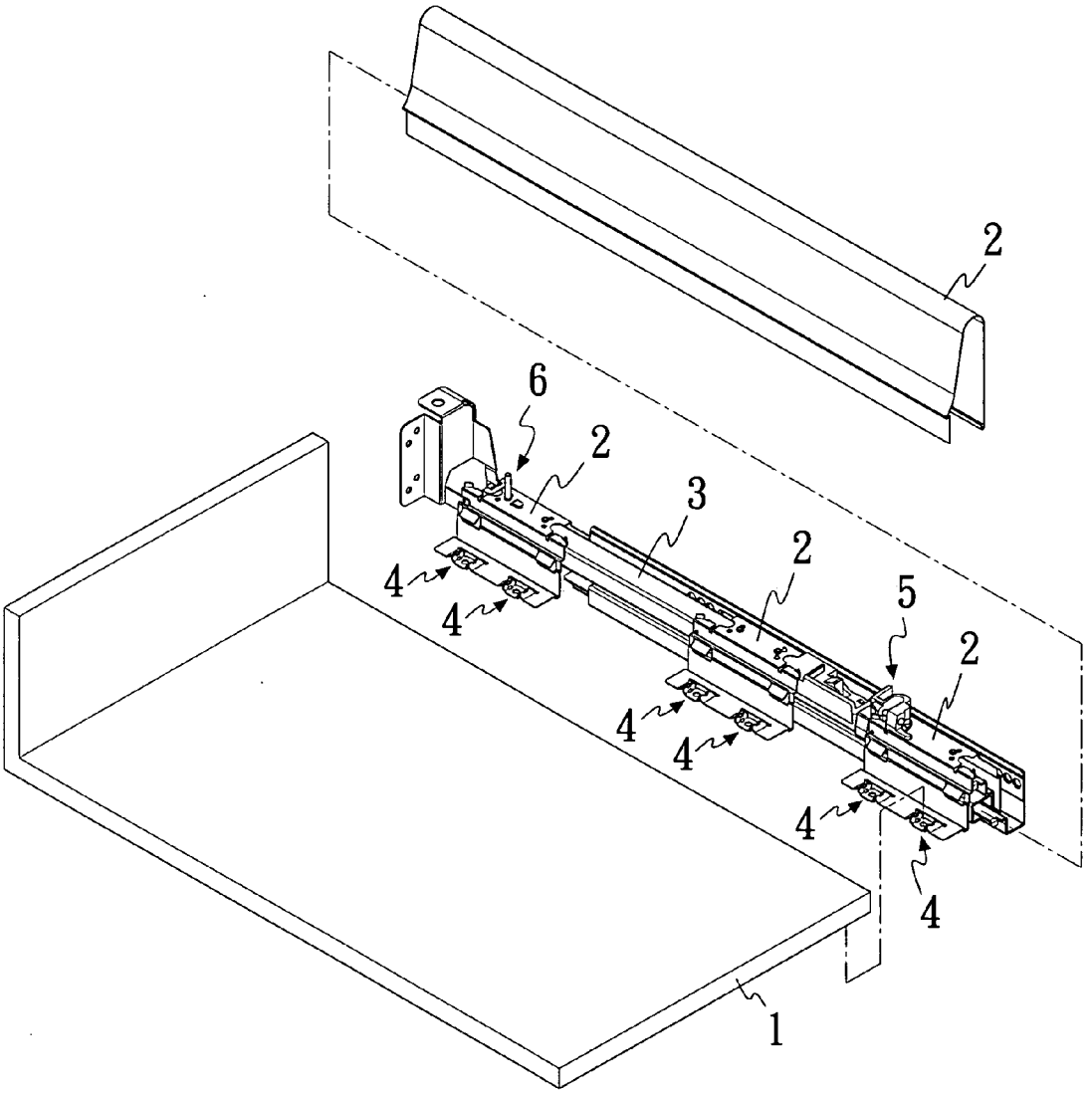


Fig. 1

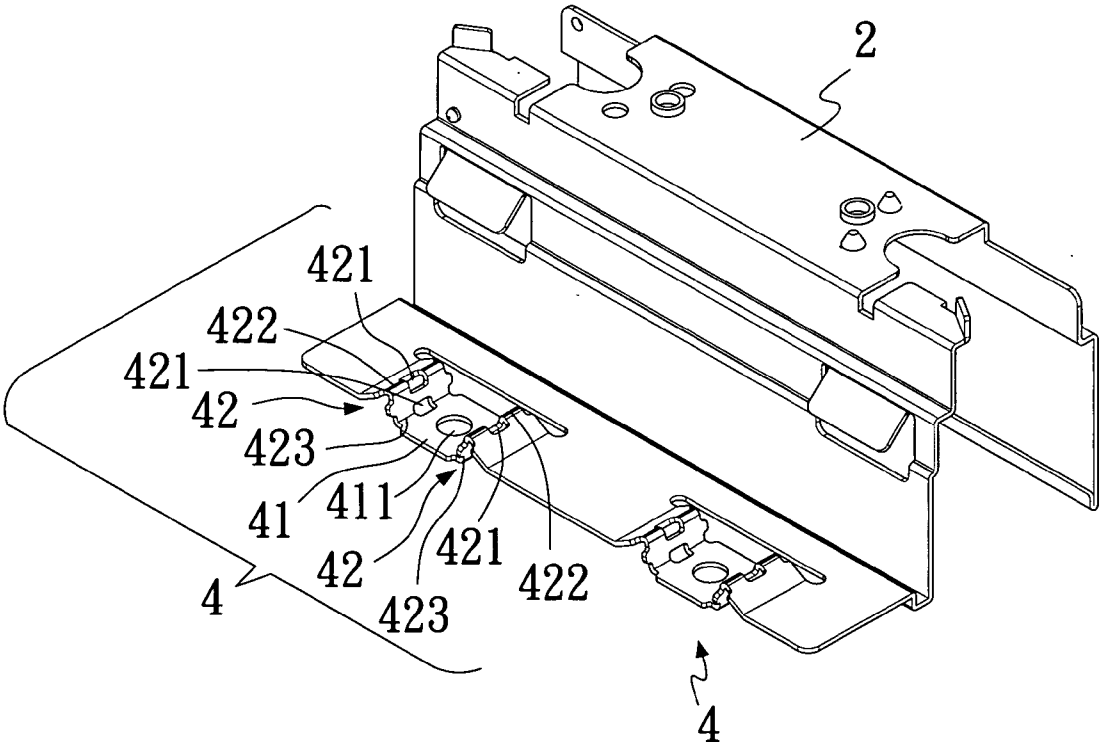


Fig. 2

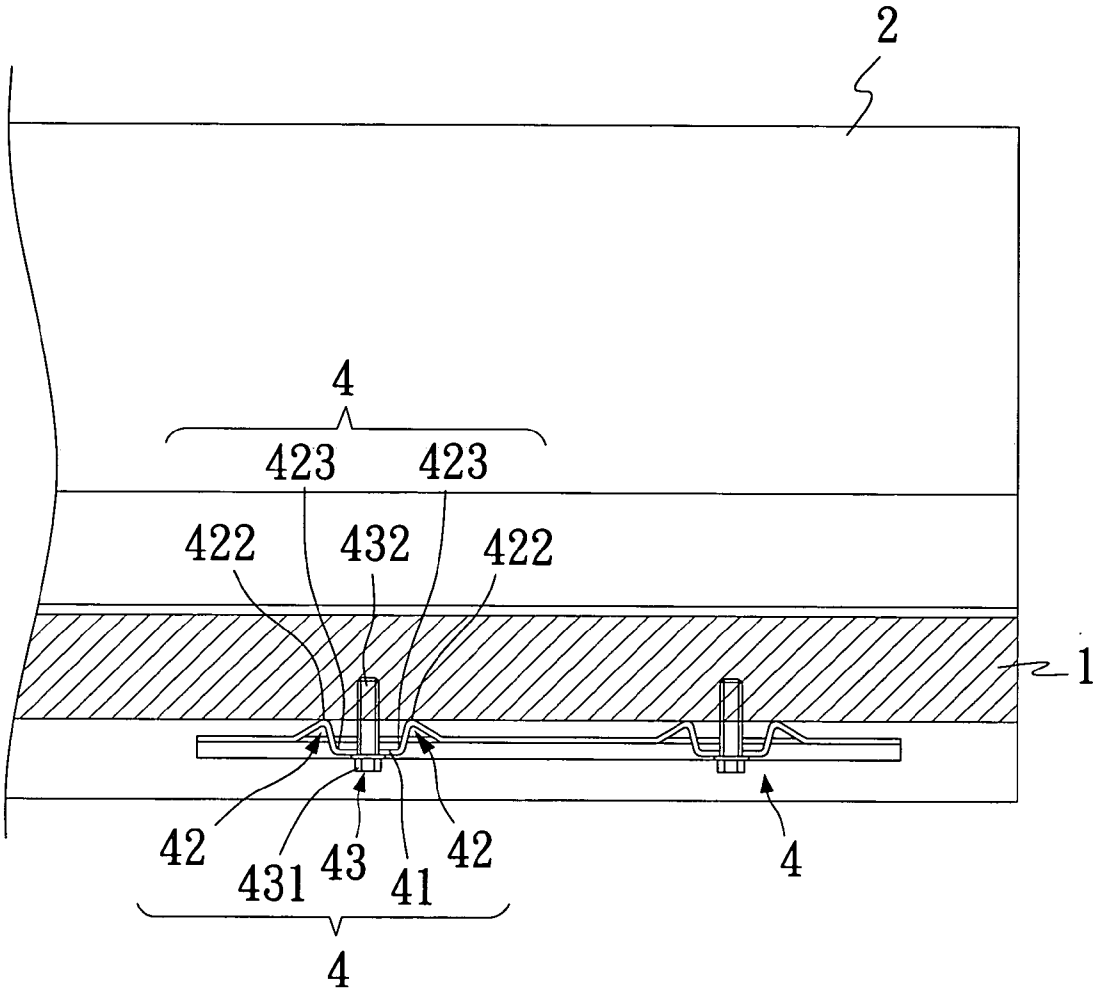


Fig. 3

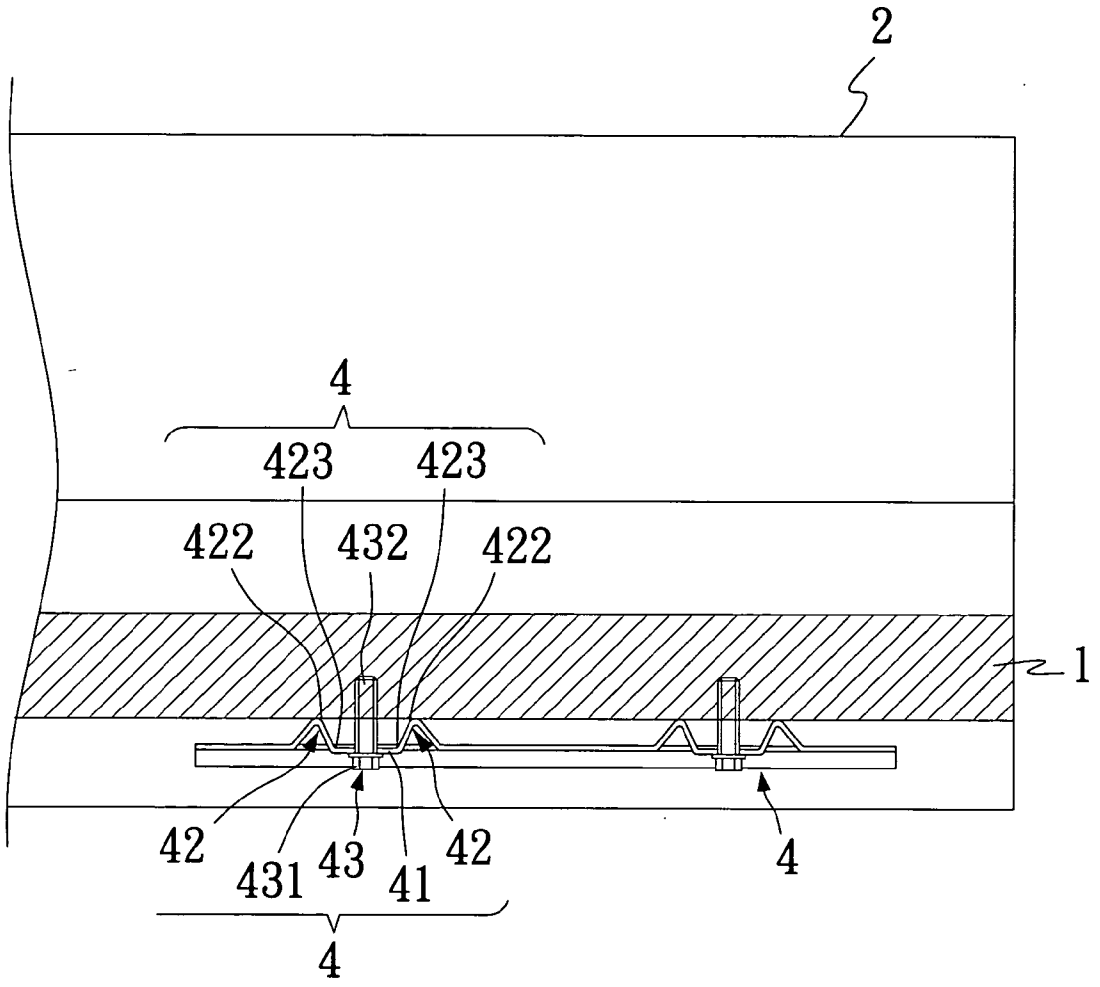


Fig. 4

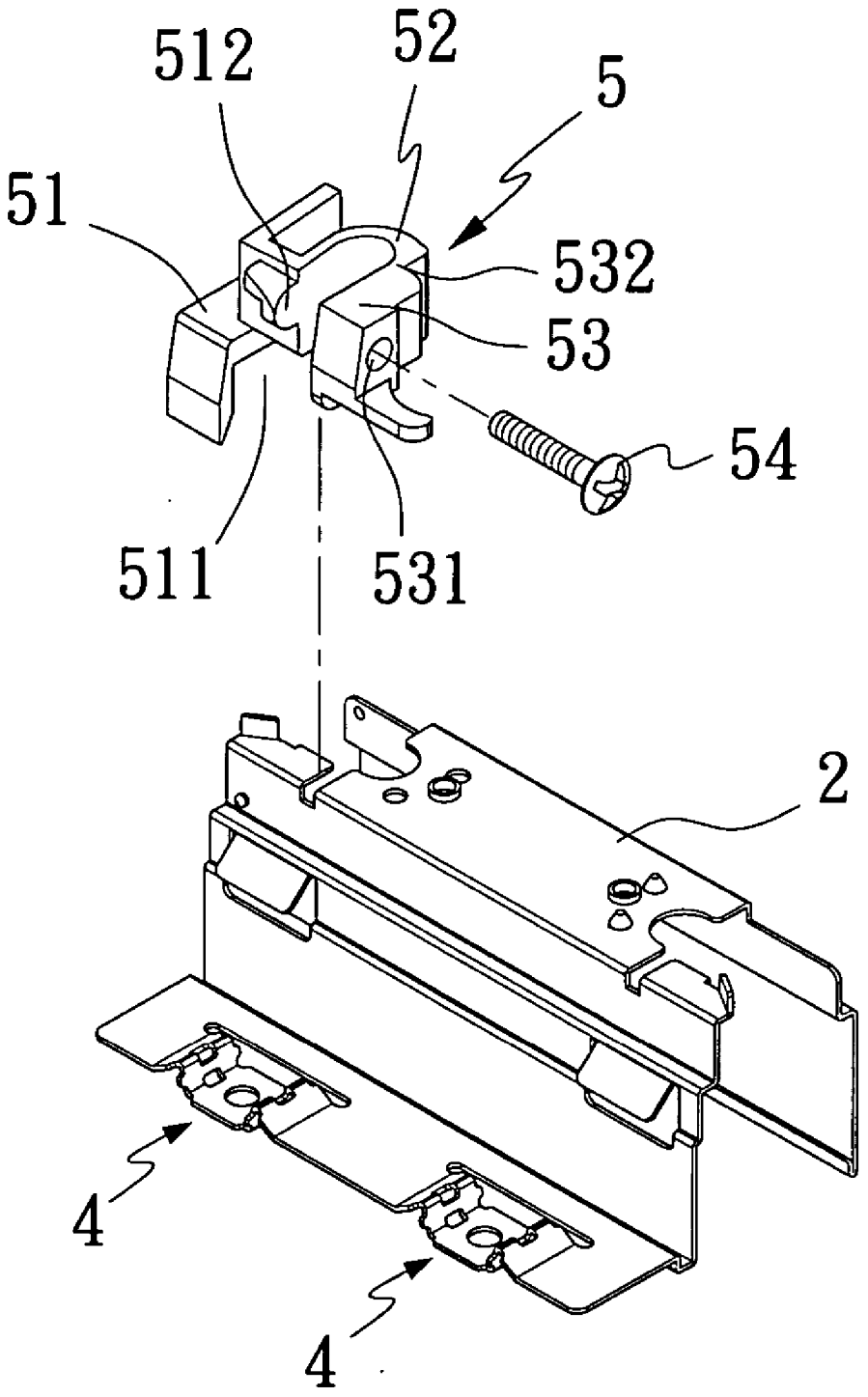


Fig. 5

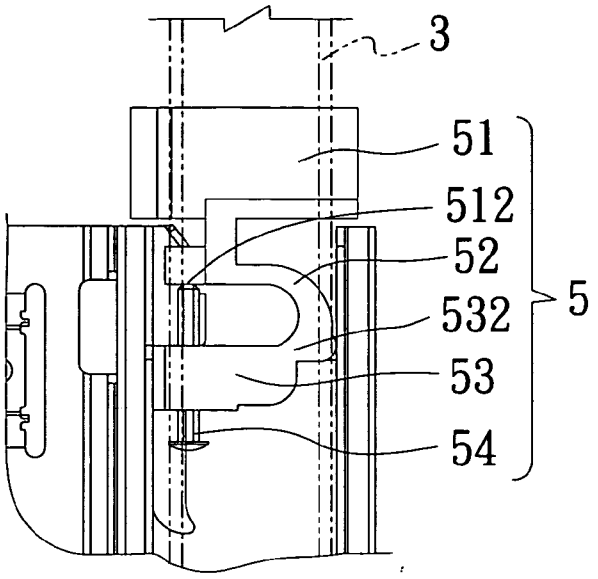


Fig. 6

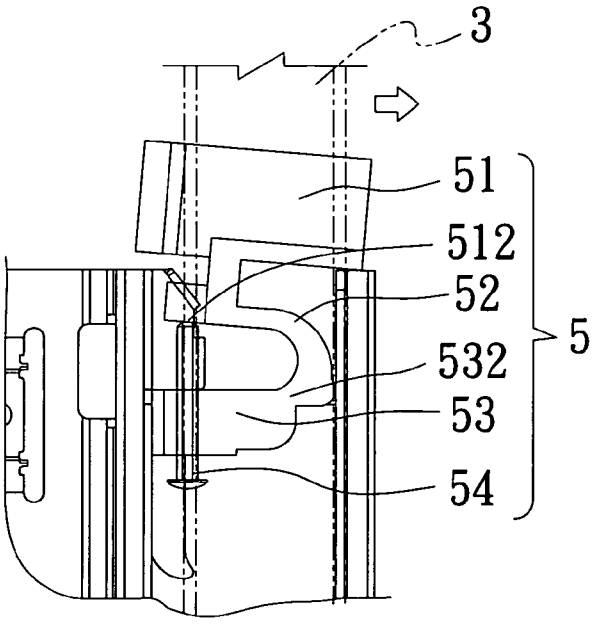


Fig. 7

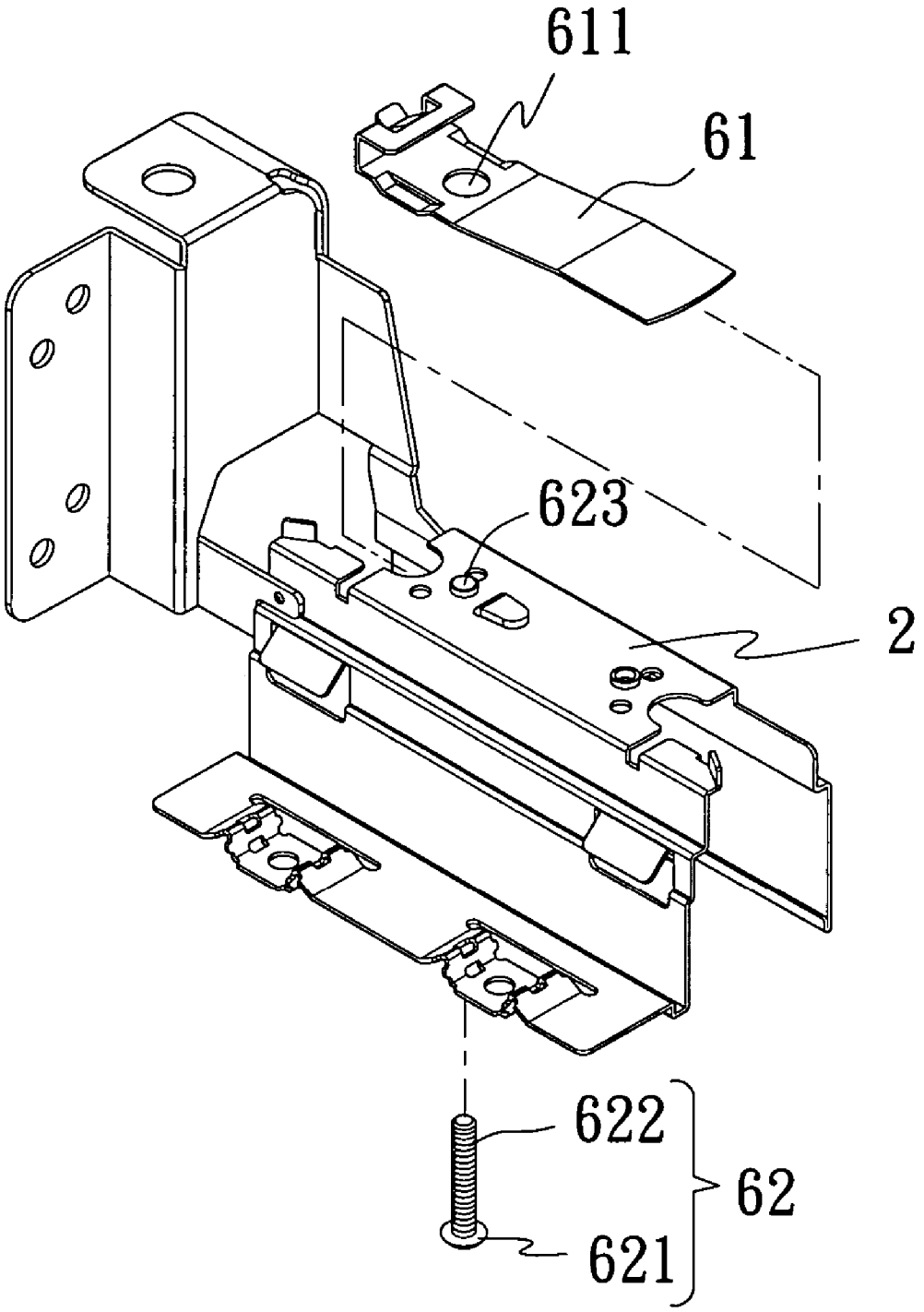


Fig. 8

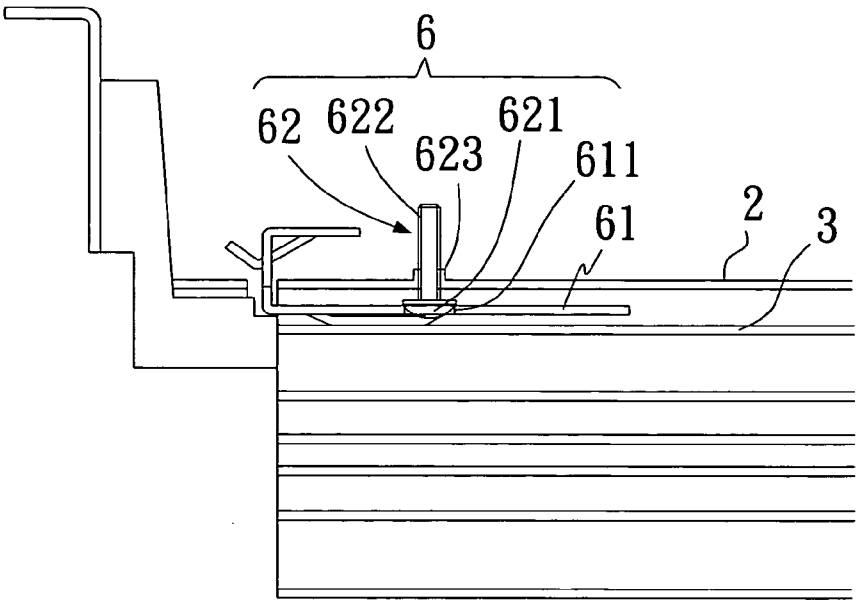


Fig. 9

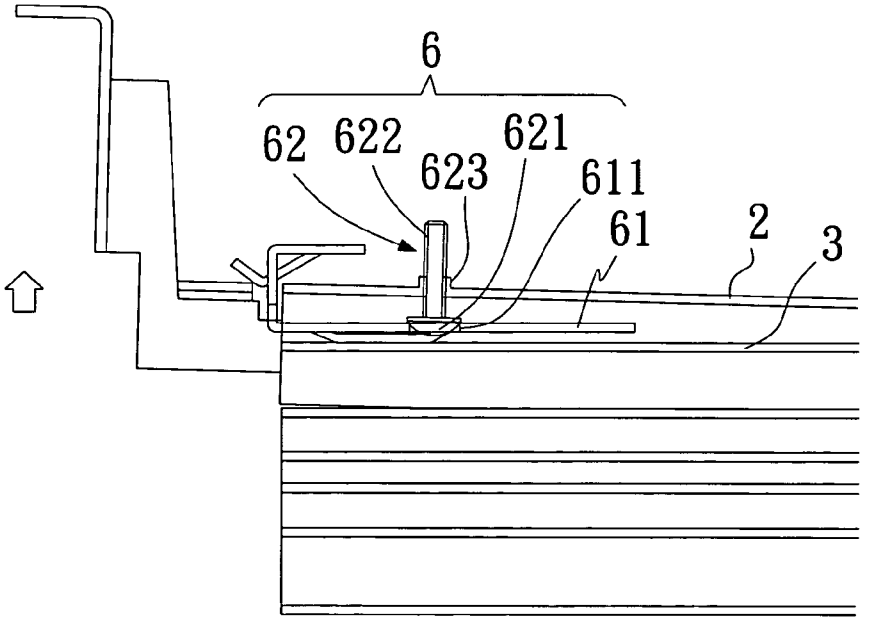


Fig. 10

DRAWER ADJUSTING MECHANISM

FIELD OF THE INVENTION

[0001] The present invention relates to a drawer adjusting mechanism, and more particularly to a drawer adjusting mechanism adapted to adjust dimensional errors of a drawer for the drawer to smoothly slide on the rails thereof.

BACKGROUND OF THE INVENTION

[0002] Drawers have become an indispensable item in people's daily life, and are widely used in governmental agencies and private enterprises for document management, as well as in most families for holding various articles. Currently, most drawers available in the markets are mass-produced on production lines in factories. It is very possible these mass-produced drawers are not accurately produced and assembled to result in many problems, such as errors in the drawer bottom level caused by errors in the thickness and dimensions of the drawer bottom, errors in the sliding direction of the drawer caused by a drawer front panel not centered at a front end of a drawer box, and an axial slope of the drawer preventing the drawer from smoothly sliding along the rails thereof. A lot of time and efforts are needed to disassemble and reassemble the drawers or replace some parts thereof, so that the drawers may be smoothly slid along the rails thereof. When a consumer purchases the currently very popular DIY (Do It Yourself) furniture and tries to assemble different parts thereof, the drawers included in the DIY furniture might also have the same dimensional errors.

[0003] It is therefore tried by the inventor to develop a drawer adjusting mechanism for adjusting any error in the dimensions of a drawer, so that the drawer could be smoothly slid on the rails thereof.

SUMMARY OF THE INVENTION

[0004] A primary object of the present invention is to provide a drawer adjusting mechanism, which includes a drawer bottom level adjusting mechanism, a drawer sliding direction adjusting mechanism, and a drawer slope adjusting mechanism to enable an assembled drawer with errors to smoothly slide along the rails thereof.

[0005] In a first aspect of the present invention, there is provided a drawer bottom level adjusting mechanism, which includes a fastening plate provided with a centered through hole; two bent plates, each of which has an upward peak being in contact with a lower surface of a bottom of a drawer, the two bent plates being connected at respective inner ends to two opposite ends of the fastening plate to form two joints, and at respective outer ends to a first rail of the drawer; and a connecting element having a shank and an expanded head, the shank being extended through the central hole on the fastening plate to partially screw into the drawer bottom while the expanded head is abutted on an outer side of the central hole; whereby when the connecting element is further screwed into the drawer bottom, the expanded head of the connecting element is brought to press against the fastening plate, and the peaks of the two bent plates and the drawer bottom are brought to displace in a direction generally parallel to a normal of the drawer bottom.

[0006] In a second aspect of the present invention, there is provided a drawer sliding direction adjusting mechanism, which includes a slide section defining an open-bottom recess, which extends across a full length of said slide section and has an open direction generally parallel to a normal of a bottom of a drawer; the recess being engaged with a second rail of the drawer for the slide section to slide in a movement direction defined by the second rail; and the open direction of the recess and the movement direction of the slide section being contained in the same plane; a fixing section being fixedly connected to a first rail of the drawer, and having an axial bore provided at a predetermined position on the fixing section; an elastic connecting section connecting the fixing section to the slide section, and being connected to the fixing section at a joint; and a push element extended through the axial bore on the fixing section to press against a push block formed on the slide section; the push block and the joint of the fixing section and the elastic connecting section being located at two opposite side of the plane containing the open direction of the recess and the movement direction of the slide section; whereby when the push element is pressed against the push block of the slide section, an angular displacement of the slide section occurs to cause the first rail to displace relative to the second rail in a direction generally parallel to a bottom of the drawer.

[0007] In a third aspect of the present invention, there is provided a drawer slope adjusting mechanism, which includes a supporting plate being provided at a predetermined position with a first through hole, and disposed between a first and a second rail of a drawer, and the first rail being slidable in a movement direction defined by the second rail; and a push element having a shank and an expanded head, the expanded head being located between the first rail and the supporting plate while the shank being extended through a second through hole provided on the first rail, the expanded head being partially surrounded by the first through hole and in surface contact with the first through hole at a curved contact surface; whereby when the push element is adjusted to push the expanded head against the first through hole, the first rail is angularly displaced relative to the second rail in a direction generally parallel to a normal of a bottom of the drawer.

[0008] With the above adjusting mechanisms, any errors in an assembled drawer mounted on the rails may be adjusted for the drawer to smoothly slide on the rails.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

[0010] FIG. **1** is an exploded perspective view of a drawer adjusting mechanism according to a preferred embodiment of the present invention;

[0011] FIG. **2** is a perspective view of a drawer bottom level adjusting mechanism included in the preferred embodiment of the present invention;

[0012] FIG. **3** is a sectioned side view showing the drawer bottom level adjusting mechanism of FIG. **2** before being adjusted to lift a drawer bottom to a higher level;

[0013] FIG. **4** is a sectioned side view showing the drawer bottom level adjusting mechanism of FIG. **2** after being adjusted to lift a drawer bottom to a higher level;

[0014] FIG. **5** is an exploded perspective view of a drawer sliding direction adjusting mechanism included in the preferred embodiment of the present invention;

[0015] FIG. **6** is a top view showing the drawer sliding direction adjusting mechanism of FIG. **5** before being adjusted to correct the sliding direction of a drawer;

[0016] FIG. **7** is a top view showing the drawer sliding direction adjusting mechanism of FIG. **5** after being adjusted to correct the sliding direction of a drawer;

[0017] FIG. **8** is an exploded perspective view of a drawer slope adjusting mechanism included in the preferred embodiment of the present invention;

[0018] FIG. **9** is a sectioned side view showing the drawer slope adjusting mechanism of FIG. **8** before being adjusted to correct an axial slope of a drawer; and

[0019] FIG. **10** is a sectioned side view showing the drawer slope adjusting mechanism of FIG. **8** after being adjusted to correct an axial slope of a drawer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] Please refer to FIG. **1** that is an exploded perspective view of a drawer adjusting mechanism according to a preferred embodiment of the present invention. As shown, the drawer adjusting mechanism of the present invention includes a first rail **2**, a second rail **3**, at least one drawer bottom level adjusting mechanism **4**, a drawer sliding direction adjusting mechanism **5**, and a drawer slope adjusting mechanism **6**. The drawer bottom level adjusting mechanism **4** is formed on the first rail **2** to locate below and support a drawer bottom **1**, and to adjust any error in a level of the drawer bottom **1** caused by any error in the thickness of the drawer bottom **1**. The drawer sliding direction adjusting mechanism **5** is fixedly mounted to the first rail **2** for the first rail **2** to correct any error in a sliding direction of the drawer caused by a drawer front panel (not shown) not centered at a front end of a drawer box (not shown), so that the drawer could smoothly slide in a movement direction defined by the second rail **3**. The drawer slope adjusting mechanism **6** is located between the first rail **2** and the second rail **3** for correcting any error in axial slope of a drawer, so that the drawer could be smoothly slid on the rails.

[0021] Please refer to FIG. **2**, which is a perspective view showing the drawer bottom level adjusting mechanism **4** included in the preferred embodiment of the present invention, and to FIGS. **3** and **4** that are sectioned side views showing the drawer bottom level adjusting mechanism **4** before and after, respectively, being adjusted to correct a level of the drawer bottom **1**.

[0022] As shown, the drawer bottom level adjusting mechanism **4** includes a fastening plate **41** provided with a centered through hole **411**, two upward bent plates **42** connected at respective inner end to two opposite ends of the fastening plate **41**, and a connecting element **43**. Each of the two upward bent plates **42** includes a peak **422**, on which a first through hole or notch **421** is formed to enable easy bending of the peak **422**. The connecting element **43** is a screw in the illustrated preferred embodiment, and has an expanded head **431** and a shank **432**. The peak **422** is in contact with a lower surface of the drawer bottom **1** to support the drawer bottom **1** thereon. A joint **423** between each of the two upward bent plates **42** and the fastening plate **41** is provided with a second through hole or notch **421** to enable easy bending of the joint **423**. An outer end of each of the two bent plates **42** opposite to the fastening plate **41** is connected to the first rail **2**. The shank **432** of the screw **43** is upward extended through the central hole **411** to partial screw into the drawer bottom **1** while the expanded head **431** is abutted on an outer surface of the fastening plate **41**. When the screw **43** is further tightened against the drawer bottom **1**, the expanded head **431** of the screw **43** is brought to push the fastening plate **41** toward the lower surface of the drawer bottom **1**, causing the peaks **422** and the drawer bottom **1**, which is in contact with the peaks **422**, to displace in a direction generally parallel to a normal of the drawer bottom **1**.

[0023] FIG. **5** is an exploded perspective view showing the drawer sliding direction adjusting mechanism **5** included in the preferred embodiment of the present invention, and FIGS. **6** and **7** are top views showing the drawer sliding direction adjusting mechanism **5** before and after, respectively, being adjusted to correct the sliding direction of a drawer. As shown, the drawer sliding direction adjusting mechanism **5** includes a slide section **51**, a fixing section **52**, an elastic connecting section **53**, and a push element **54**.

[0024] As shown, the slide section **51** defines an open-bottom recess **511** extending across a full length of the slide section **51**. An open direction of the recess **511** is parallel to the normal of the drawer bottom **1** (not shown in FIGS. **5**, **6**, and **7**). The fixing section **53** is provided at a predetermined position with an internally threaded axial bore **531**. The push element **54** is a screw in the illustrated preferred embodiment. The recess **511** of the slide section **51** is engaged with the second rail **3** (see FIGS. **6** and **7**), causing the slide section **51** to slide in the movement direction defined by the second rail **3**. The open direction and the movement direction of the recess **511** are on the same plane. The fixing section **53** is fixedly connected to the first rail **2**. The elastic connecting section **52** connects the fixing section **53** to the slide section **51**, and is connected to the fixing section **53** at a joint **532**. The axial bore **531** has an axial centerline generally parallel to the movement direction determined by the second rail **3**. The screw **54** is screwed into and projected from the axial bore **531** to press against a push block **512** provided at a predetermined position on the slide section **51**. The push block **512** and the joint **532** are separately located at two opposite sides of the plane containing the open direction and the movement direction of the recess **511**, such that when the screw **54** is adjusted to press against the push block **512**, an angular displacement of the slide section **51** occurs to cause the first rail **2** to displace relative to the second rail **3** in a direction generally parallel to the drawer bottom **1** (not shown in FIGS. **5** through **7**).

[0025] FIG. **8** is an exploded perspective view showing the drawer slope adjusting mechanism **6** included in the preferred embodiment of the present invention, and FIGS. **9** and **10** are sectioned side views showing the drawer slope adjusting mechanism **6** before and after, respectively, being adjusted to correct an axial slope of a drawer.

[0026] As shown, the drawer slope adjusting mechanism **6** includes a supporting plate **61** and a push element **62**. The

supporting plate **61** is provided at a predetermined position with a through hole **611**. The push element **62** is a screw in the illustrated preferred embodiment, and includes an expanded head **621** and a shank **622**. The supporting plate **61** is disposed between the first rail **2** and the second rail **3** of the drawer, and the first rail **2** is able to slide in a movement direction defined by the second rail **3**. The expanded head **621** of the screw **62** is located between the first rail **2** and the supporting plate **61** while the shank **622** of the screw **62** is upward screwed into and projected from an internally threaded through hole **623** provided on the first rail **2**. More specifically, the expanded head **621** of the screw **62** is partially surrounded by the through hole **611** on the supporting plate **61**, and is in surface contact with the through hole **61**. It is noted a contact surface between the expanded head **621** of the screw **62** and the through hole **611** is a curved surface. When the screw **62** is adjusted to push the expanded head **621** against the through hole **611**, an angular displacement of the first rail **2** relative to the second rail **3** in a direction generally parallel to a normal of the drawer bottom **1** (not shown in FIGS. **8** through **10**) occurs.

[**0027**] With the drawer bottom level adjusting mechanism **4**, the drawer sliding direction adjusting mechanism **5**, and the drawer slope adjusting mechanism **6** of the drawer adjusting mechanism of the present invention, dimensional errors of an assembled drawer may be adjusted to allow smooth sliding of the drawer on the rails. It is anticipated products derived from the present invention are industrially practical for use and would fully satisfy the current market demands.

What is claimed is:

1. A drawer bottom level adjusting mechanism, comprising:

a fastening plate provided with a centered through hole;

two bent plates, each of which has an upward peak being in contact with a lower surface of a bottom of a drawer; said two bent plates being connected at respective inner end to two opposite ends of said fastening plate to form two joints, and at respective outer end to a first rail of said drawer; and

a connecting element having a shank and an expanded head; said shank being extended through said central hole on said fastening plate to partially screw into said drawer bottom while said expanded head is abutted on an outer side of said central hole;

whereby when said connecting element is further screwed into said drawer bottom, said expanded head of said connecting element is brought to press against said fastening plate, and said peaks of said two bent plates and said drawer bottom are brought to displace in a direction generally parallel to a normal of said drawer bottom.

2. The drawer bottom level adjusting mechanism as claimed in claim 1, wherein each of said joints of said bent plates and said fastening plate is provided with at least one through hole or notch, so that said joints are easy to bend.

3. The drawer bottom level adjusting mechanism as claimed in claim 1, wherein each of said peaks of said bent plates is provided with at least one through hole or notch, so that said peaks are easy to bend.

4. The drawer bottom level adjusting mechanism as claimed in claim 1, wherein said connecting element is a screw.

5. A drawer sliding direction adjusting mechanism, comprising:

a slide section defining an open-bottom recess, which extends across a full length of said slide section and has an open direction generally parallel to a normal of a bottom of a drawer; said recess being engaged with a second rail of said drawer for said slide section to slide in a movement direction defined by said second rail; and said open direction and said movement direction of said recess being located in the same plane;

a fixing section being fixedly connected to a first rail of said drawer, and having an axial bore provided at a predetermined position on said fixing section;

an elastic connecting section connecting said fixing section to said slide section, and being connected to said fixing section at a joint; and

a push element extended through said axial bore on said fixing section to press against a push block formed on said slide section; said push block and said joint of said fixing section and said elastic connecting section being located at two opposite side of said plane containing said open direction and said movement direction of said recess; whereby when said push element is pressed against said push block of said slide section, an angular displacement of said slide section occurs to cause said first rail to displace relative to said second rail in a direction generally parallel to a bottom of the drawer.

6. The drawer sliding direction adjusting mechanism as claimed in claim 5, wherein said axial bore on said fixing section is internally threaded, and wherein said push element is a screw.

7. The drawer sliding direction adjusting mechanism as claimed in claim 5, wherein said axial bore has an axial centerline generally parallel to said movement direction.

8. A drawer slope adjusting mechanism, comprising:

a supporting plate being provided at a predetermined position with a first through hole, and disposed between a first and a second rail of a drawer, and said first rail being slidable in a movement direction defined by said second rail; and

a push element having a shank and an expanded head; said expanded head being located between said first rail and said supporting plate while said shank being extended through a second through hole provided on said first rail; said expanded head being partially surrounded by said first through hole and being in surface contact with said first through hole at a curved contact surface;

whereby when said push element is adjusted to push said expanded head against said first through hole, said first rail is angularly displaced relative to said second rail in a direction generally parallel to a normal of a bottom of the drawer.

9. The drawer slope adjusting mechanism as claimed in claim 8, wherein said second through hole is internally threaded, and said push element is a screw.

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