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(71) Applicant: **ROLLMECH AUTOMOTIVE SANAYI VE TICARET ANONIM SIRKETI** [TR/TR]; Btso Organize Sanayi Bolgesi Yesil Cad. No:15, Bursa (TR).

(72) Inventors: **PARILDAR, Neslihan**; Btso Organize Sanayi Bolgesi Yesil Cadde No:15, 16159 Nilufer/Bursa (TR). **GUZELDAL, Huseyin**; Btso Organize San. Bolgesi. Yesil Cadde No:15, Bursa (TR).

(74) Agent: **KAYA, Erdem**; Erdem Kaya Patent Inc., Konak Mahallesi Kudret Sk. Elitpark Park Sit. Ofisler Apt. No:12/27, Nilufer/Bursa (TR).

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(54) Title: A SLIDING DOOR MECHANISM WITH HEIGHT ADJUSTABILITY

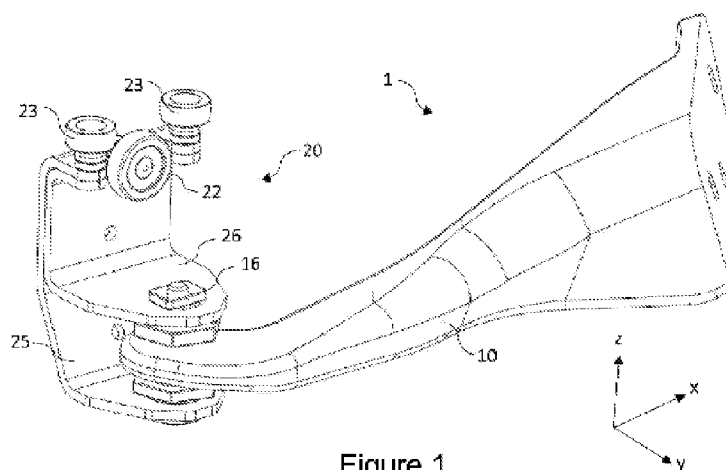


Figure 1

(57) Abstract: The present invention relates to an embodiment which provides height adjustment in Z axis for a roller mechanism (1) for vehicles with sliding doors and comprising a body bracket (10) which provides connection with the sliding door by means of the connection holes (18) existing in the structure thereof and which provides carrying of the sliding door; and a sandwich bracket (20) connected to said body bracket (10); said roller mechanism (1) provides driving of the sliding door thanks to the carrier roller (22) and the guide roller (23) connected to said sandwich bracket (20) by means of pins (24).



## A SLIDING DOOR MECHANISM WITH HEIGHT ADJUSTABILITY

### 5 TECHNICAL FIELD

The present invention essentially relates to roller mechanisms used in vehicles with sliding door and which allows carrying of the sliding door.

10 The present invention particularly relates to a roller mechanism which allows adjustment of sliding door in axis Z with respect to the vehicle body.

### KNOWN STATE OF THE ART

15 There are guides for providing movement of sliding door on vehicle body in vehicles with sliding door. There are roller mechanisms which allow movement of sliding door on these guides. In roller mechanisms, axis adjustments shall be made for adjusting the axial eccentricities and for closing the sliding door at correct position when sliding door connection is made.

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For the roller mechanisms existing in the known state of the art, it is difficult to make adjustment in axis Y horizontally and in axis Z orthogonally. When an adjustment is made in an axis, the adjustments in the other axis may deteriorate and adjustment has to be made again. Since some adjustment mechanisms have a complex structure, production costs are  
25 excessive, and the assembly of parts becomes very difficult.

25

In the patent document with number JP2006200216 filed in Japan and existing in the known state of the art, it has been described that there is a slot hole which allows adjustment of the roller mechanism in Y-axis. In the patent document, there is no solution related to making  
30 adjustment in Z-axis.

30

In the patent document with number JPH08268074 existing in the known state of the art, a roller mechanism is described which has a hole in the form of slot and which allows making adjustment in Y-axis. In this patent application, no solution is presented related to making  
35 adjustment in Z-axis.

35

In the utility model application with number CN201849295 filed in China and existing in the known state of the art, a roller mechanism embodiment is described having adjustability in axis Y in a similar manner. However, there is no data related to making adjustment in Z axis.

5 As a result, improvements are made in roller mechanisms, and therefore, new embodiments are needed which will eliminate the above mentioned disadvantages and which will bring a solution to the present systems.

### **OBJECT OF THE INVENTION**

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The present invention relates to a roller mechanism, for meeting the above mentioned requirements and for eliminating all disadvantages and for bringing additional advantages.

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The main object of the present invention is to provide an adjustment mechanism which allows adjustment of roller mechanisms, used in vehicles with sliding door and which carry sliding door, in axis Z and in axis Y.

20

An object of the present invention is to provide the adjustment mechanism, which allows adjustment in axis Z, on the axis pin which provides connection thereof with the body bracket and where the sandwich bracket where the rollers are connected gains rotational freedom.

25

Another object of the present invention is to provide axis adjustment which is easily accessible and which is realized in a simple manner.

Another object of the present invention is to develop a compact adjustment mechanism which can operate in all roller mechanisms which carry sliding door.

30

In order to realize the above mentioned advantages and the advantages to be deducted from the detailed description below, the present invention is a roller mechanism for vehicles with sliding doors and comprising a body bracket which provides connection with the sliding door by means of the connection holes existing in the structure thereof and which provides carrying of the sliding door; and a sandwich bracket connected to said body bracket; said roller mechanism provides driving of the sliding door thanks to the carrier roller and the guide roller connected to said sandwich bracket by means of pins. The subject matter roller

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mechanism is characterized by comprising:

- at least one adjustment bolt connected to the threaded hole provided on said body bracket and which provides adjustment in axis Z and whose outer surface has a threaded structure and whose inner surface is gapped and having a bolt head which facilitates tightening from outside,
- 5 - at least one bearing which will provide free rotation of the adjustment bolt by means of passing through two ends of said adjustment bolt, namely the bottom and top ends thereof,
- at least one contra nut connected to said adjustment bolt and which provides fixation of the adjustment made in direction Z and which contacts the body bracket when tightened,
- at least one axis pin provided on said bearing, the adjustment bolt, threaded hole, contra  
10 nut and sandwich bracket and passed through the slot holes and which provides rotational freedom to the sandwich braket and which keeps the other parts together and whose one end is threaded,
- at least one nut which exerts pressure by contacting the upper bracket of said sandwich bracket and which provides fixation of the axis pin.

15

The structural and characteristic properties and all advantages of the present invention will be understood in a more clear manner by means of the below mentioned figures and the detailed description written by making reference to these figures. Therefore, evaluation shall be made by taking into consideration these figures and the detailed description.

20

### **BRIEF DESCRIPTION OF THE FIGURES**

In order to understand the embodiment of the present invention and the advantages together with additional elements, they shall be evaluated together with the figures whose description  
25 is given below.

Figure 1 is the isometric view of the subject matter roller mechanism.

Figure 2 is the frontal view of the subject matter roller mechanism.

30

Figure 3 is the B-B cross-sectional view of the subject matter roller mechanism.

Figure 4 is the dismantled view of the subject matter roller mechanism.

### **REFERENCE NUMBERS**

1. Roller mechanism

- 10. Body bracket
- 11. Axis pin
- 12. Bearing
- 13. Bushing
- 5 14. Adjustment bolt
- 15. Contra nut
- 16. Nut
- 17. Threaded hole
- 18. Connection hole
- 10 20. Sandwich bracket
- 21. Slot hole
- 22. Carrier roller
- 23. Guide roller
- 24. Pin
- 15 25. Lower bracket
- 26. Upper bracket

## DETAILED DESCRIPTION OF THE INVENTION

20 In this detailed description, the preferred embodiments of the subject matter roller mechanism (1) are explained with references to examples without forming any restrictive effect only in order to make the subject more understandable.

In Figure 1, the isometric view of the subject matter roller mechanism (1) is given, and in  
25 Figure 2, the frontal view of the subject matter roller mechanism (1) is given. In Figure 3, the B-B cross-sectional view of the subject matter roller mechanism (1) is given, and in Figure 4, the dismantled view of the subject matter roller mechanism (1) is given.

The roller mechanism (1), which carries the door, is fixed onto the vehicle body (not  
30 illustrated in the figures) by means of connection holes (18) provided on the body bracket (10). After the roller mechanism (1) is connected to the sliding door, adjustment must be made in axes Y and Z in order to seat the sliding door to the body completely. Axis Y adjustment is realized by means of slot hole (21) provided on the lower and upper brackets (25, 26) forming the sandwich bracket (20). Axis Z adjustment is realized on the axis pin (11)  
35 where the sandwich bracket (20), connected to the carrier and to the guide rollers (22, 23), is connected to the body bracket (10) in a rotatable manner.

In assembly of the product, the guide rollers (23) are assembled to the sandwich bracket (20) by means of a pin (24). In a similar manner, the carrier roller (22) is assembled to the sandwich bracket by means of a pin (24).

5 The adjustment bolt (14), whose one end is in the form of a bolt head and whose inner side has a gapped structure, is connected to the threaded hole (17) provided on the body bracket thanks to the threads provided on the cylindrical external surface of said adjustment bolt (14). Afterwards, the contra nut (15) is connected to the adjustment bolt (14) which extends from the upper part of the threaded hole (17) provided at the body bracket (10). The bushing (13),  
10 produced preferably from teflon material, is passed through the holes provided at the lower and upper parts of the adjustment bolt (14), and afterwards, the bearing (12) part which comprises gap such that the axis pin (11) passes therethrough is passed through the bushing (13) part fixed from the lower and upper parts and bedded. This structure thereby formed is placed so as to be provided between the lower bracket (25) and the upper bracket  
15 (26) forming the sandwich bracket (20), and said lower and upper brackets (25, 26) provide fixation of the structure by means of the axis pin (11) passed through the slot hole (21) provided thereon and by means of a nut (16) part fixed to the upper part of the axis pin (11) which has a threaded structure.

20 It is apparent that various different fixation tools can be used instead of the nut (16) part used.

As the nut (16) connected to the axis pin (11) is loosened, the axis pin (11) can move in the slot hole (21) provided on the sandwich bracket (20). Thanks to this, adjustment is made at  
25 the desired level in axis Y and the movement in axis Y is fixed as the nut (16) is tightened again. After movement is fixed in axis Y, adjustment can also be made in axis Z.

Thanks to the bushing (13) and the bearing (12) parts provided in the structure, the adjustment bolt (14) can easily rotate in its own axis. Rotation of the adjustment bolt (14) in  
30 the clockwise direction or in the counter-clockwise direction depending on the direction of the threads provided in the structure of the adjustment bolt (14) moves the body bracket (10), connected by means of the threaded hole (17), downwardly or upwardly. Downward and upward movement of the body bracket (10) provides making height adjustment of the sliding door (not illustrated in the figures) in axis Z. After adjustment is made at the desired level, the  
35 contra nut (15) is tightened and the movement in direction Z is fixed. Some screw locking adhesives can be preferred for preventing loosening of the used bolt-nut embodiments due to the vibrations which may occur in the vehicle.

**CLAIMS**

1. A roller mechanism (1) for vehicles with sliding doors and comprising a body bracket (10) which provides connection with the sliding door by means of the connection holes (18) existing in the structure thereof and which provides carrying of the sliding door; and a sandwich bracket (20) connected to said body bracket (10); said roller mechanism (1) provides driving of the sliding door thanks to the carrier roller (22) and the guide roller (23) connected to said sandwich bracket (20) by means of pins (24), **wherein** said roller mechanism (1) comprises:
- at least one adjustment bolt (14) connected to the threaded hole (17) provided on said body bracket (10) and which provides adjustment in axis Z and whose outer surface has a threaded structure and whose inner surface is gapped and having a bolt head which facilitates tightening from outside,
  - at least one bearing (12) which will provide free rotation of the adjustment bolt (14) by means of passing through two ends of said adjustment bolt (14), namely the bottom and top ends thereof,
  - at least one contra nut (15) connected to said adjustment bolt (14) and which provides fixation of the adjustment made in direction Z and which contacts the body bracket when tightened,
  - at least one axis pin (11) provided on said bearing (12), the adjustment bolt (14), threaded hole (17), contra nut (15) and sandwich bracket (20) and passed through the slot holes (21) and which provides rotational freedom to the sandwich bracket (20) and which keeps the other parts together and whose one end is threaded,
  - at least one nut (16) which exerts pressure by contacting the upper bracket (26) of said sandwich bracket (20) and which provides fixation of the axis pin (11).
2. The roller mechanism (1) according to claim 1, **wherein** at least one bushing (13), provided between said adjustment bolt (14) and said bearing (12), provides rotation of the adjustment bolt (14) in a more comfortable manner.
3. The roller mechanism (1) according to claim 2, **wherein** said bushing (13) is made of teflon material.

1/3

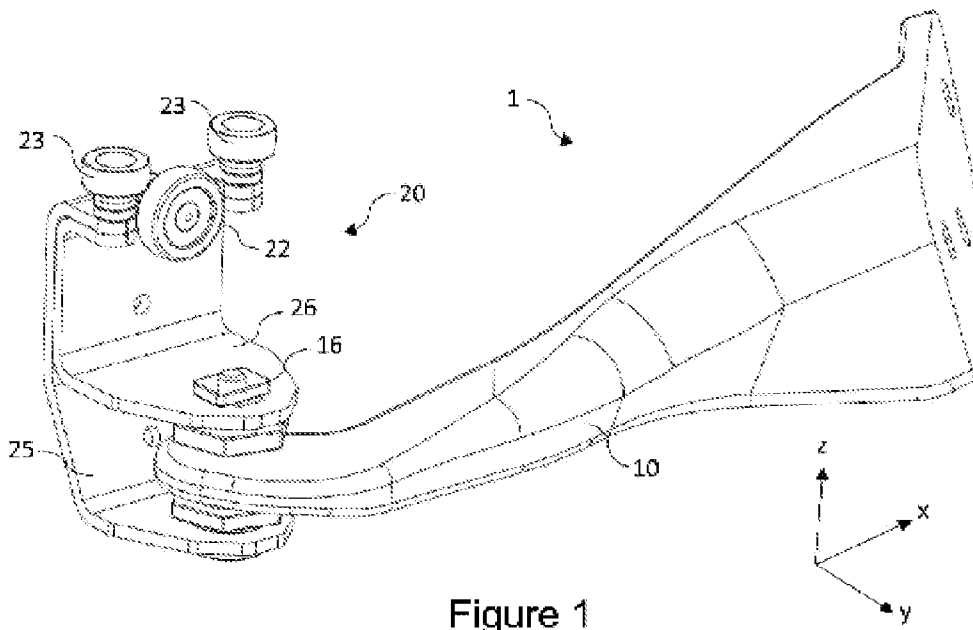


Figure 1

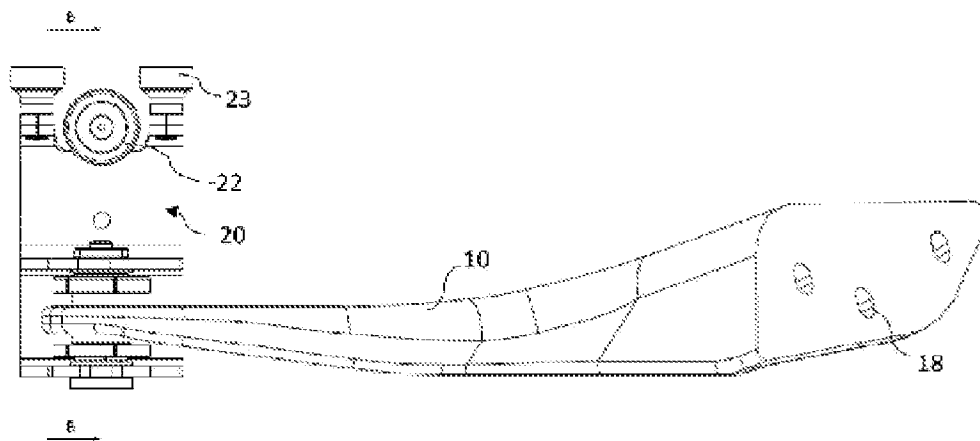


Figure 2

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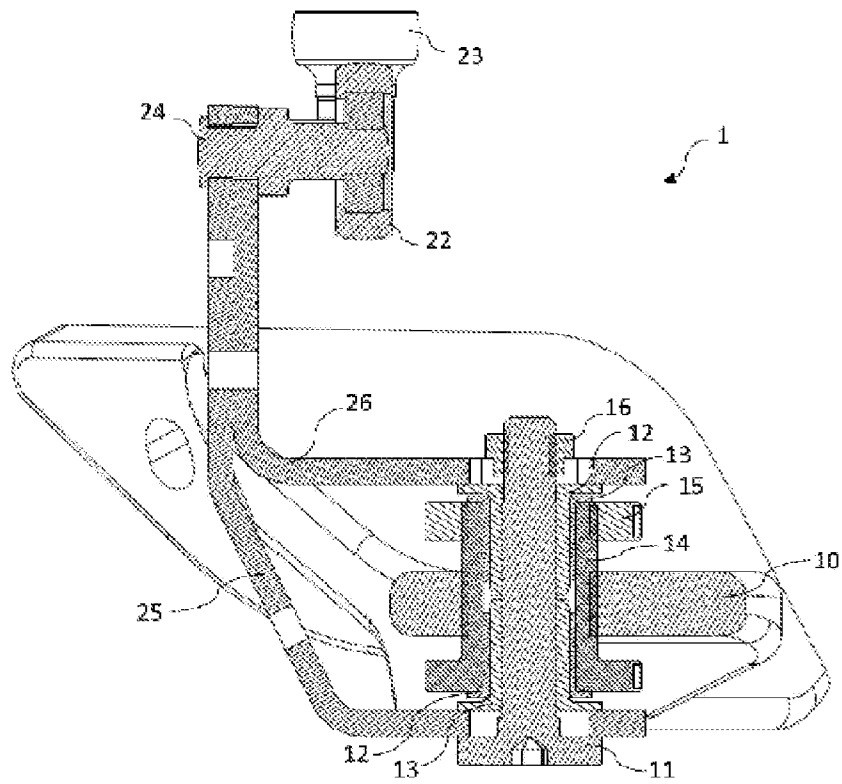


Figure 3

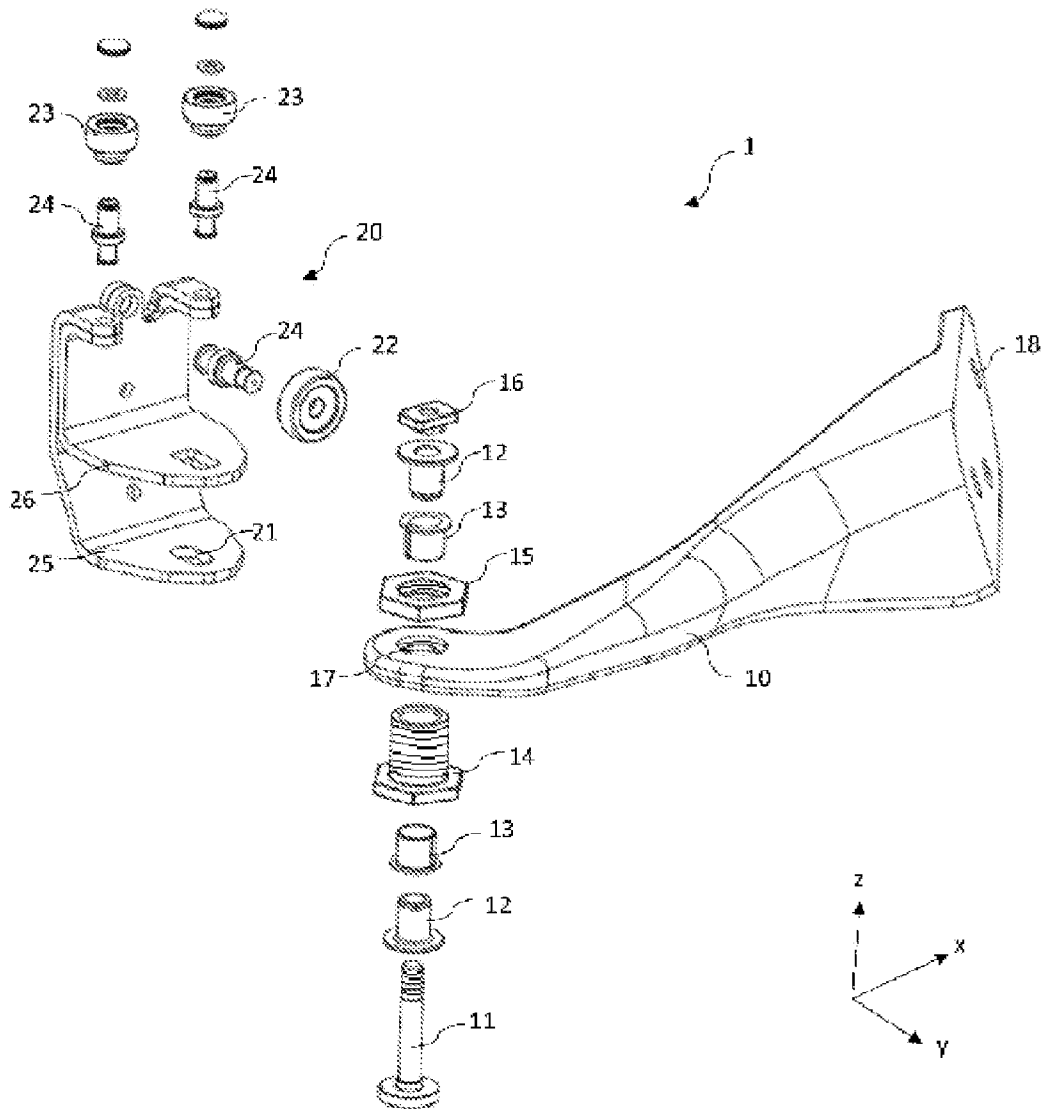


Figure 4

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/TR2019/051047

**A. CLASSIFICATION OF SUBJECT MATTER**

B60J 5/06 (2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

B60J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2007192015 A (TOYOTA MOTOR CORP) 02 August 2007 (2007-08-02) whole document	1-3
A	KR 100600190 B1 (KIA MOTORS CORP [KR]) 05 July 2006 (2006-07-05) whole document	1-3
A	KR 20040100075 A (KIA MOTORS CORP) 02 December 2004 (2004-12-02) whole document	1-3

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**Turkish Patent and Trademark Office (Turkpatent)**  
**Hipodrom Caddesi No. 13**  
**06560 Yenimahalle**  
**Ankara**  
**Turkey**

Telephone No. (90-312) 303 11 82

Facsimile No. +903123031220

Authorized officer

Harun Tarık KARAYOL

Telephone No.