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(54) **BED FRAME FOR CONVENIENT CHANGING OF BED SHEET**

(57) A bed frame convenient for changing bed sheets includes a base, a rotation module for accommodating a mattress located above the base ,a sliding module located between the rotation module and the base ,a sliding device located between the sliding module and the base , wherein the sliding module is able to slide along a length of the base through the sliding device, and a rotation device located between the sliding module and the rotation module, wherein the rotation module is able to rotate

around a central axis of the sliding module through the rotation device. Through the cooperation of the sliding device and the rotation device, a staff is able to change the bed sheet only by standing in one position, which greatly saves energy and time of the staff. After changing the bed sheet every time, the mattress is rotated exactly 180 degrees, which is able to extend the life of the mattress.

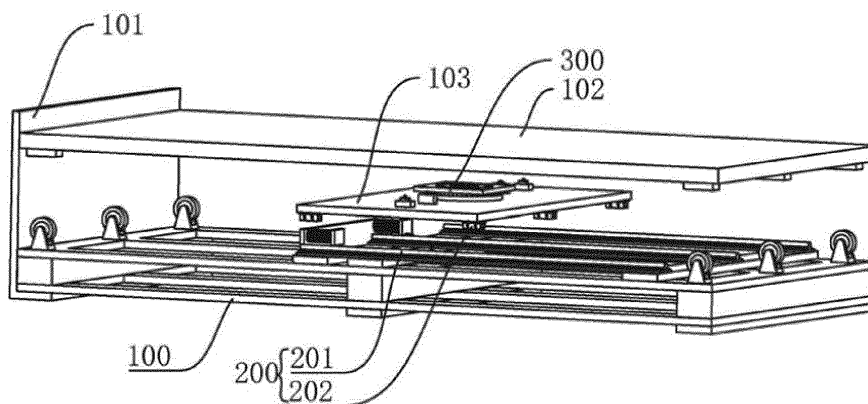


FIG. 2

Description

Technical Field

[0001] The present invention relates to the field of bed frame, and more particularly to a bed frame convenient for changing bed sheets.

Background of the Invention

[0002] In hotels, guest houses and other accommodations, when changing the bed sheet, pull the bed out of the wall first, and then move the mattress to replace the bed sheet. Due to the large mass of the bed and the mattress, the pulling process is more laborious.

Summary of the Invention

Technical Problem

[0003] At present, the Chinese Patent Publication No. CN203815016U discloses a hotel bed with a slidable bed liner. It includes a bed frame with a backrest and a support liner arranged on the bed frame, wherein a sliding device is located between the support liner and the bed frame, and the sliding device is a drawer-type sliding device. The drawer-type sliding device includes a sliding track and a sliding unit that cooperates with the sliding track. The sliding track and the sliding unit, which are located above the bed frame and below the support liner, are fixedly connected with the bed frame and the support liner, respectively.

[0004] The bed liner of the above-mentioned hotel bed is able to be easily pulled out for facilitating changing the bed sheet, and however, while changing the bed sheet, the staff needs to walk around the bed liner to completely insert the bed sheet between the bed liner and the mattress, which makes the staff time-consuming and labor-intensive.

THE SOLUTION TO THE PROBLEM

Technical Solution

[0005] An object of the present invention is to provide a bed frame convenient for changing bed sheets, which has an advantage of changing the bed sheets easily.

[0006] To achieve the above object, the present invention provides technical solutions as follows.

[0007] A bed frame convenient for changing bed sheets comprises:

- a base;
- a rotation module for accommodating a mattress located above the base;
- a sliding module located between the rotation module and the base;
- a sliding device located between the sliding module

and the base, wherein the sliding module is able to slide along a length of the base through the sliding device; and

a rotation device located between the sliding module and the rotation module, wherein the rotation module is able to rotate around a central axis of the sliding module through the rotation device.

[0008] Through the above technical solution, when a bed sheet needs to be changed, the sliding module and other elements above the sliding module are drawn out through the sliding device, and then the rotation module is driven to rotate through the rotation device, so that a staff is able to insert the bed sheet between the rotation module and the mattress without walking around the bed frame, which saves time and effort, is convenient and fast.

[0009] Preferably, the sliding device comprises a slide rail set on the base, a bottom surface of the rotation module is provided with a sliding block matched with the slide rail; the slide rail is arranged along the length direction of the base; the number of the slide rail is at least two.

[0010] Through the above technical solution, the slide rail and the sliding block are matched not only with low friction resistance, but also the slide rail limits a sliding path of the sliding module, which prevent the sliding module from shifting the sliding path..

[0011] Preferably, the sliding device comprises a slide slot set on the base, a bottom surface of the rotation module is provided with a sliding part which is able to be embedded and roll in the slide slot; the sliding part is a pulley or an universal ball; the slide slot is arranged along the length direction of the base; the number of the slide slot is at least two.

[0012] Through the above technical solution, the sliding part rolls in the slide slot to drive the rotation module to slide, which is easy and convenient.

[0013] Preferably, the rotation device comprises a rotation assembly located between the sliding module and the rotation module, wherein the rotation module rotates through the rotation assembly.

[0014] Through the above technical solution, the rotation module rotates relatively to the sliding module through the rotation assembly, which is convenient for changing the bed sheets.

[0015] Preferably, the rotation assembly comprises a bearing seat located on the sliding module, the rotation module is provided with a rotation shaft rotatably connected with the bearing seat.

[0016] Through the above technical solution, the rotation shaft matches with the bearing seat, so that the rotation module is able to rotate relatively to the sliding module, which facilitates changing the bed sheets.

[0017] Preferably, the rotation assembly comprises a big rotation disk, wherein a top surface of the big rotation disk is fixedly connected with rotation module, a bottom surface of the big rotation disk is fixedly connected with the sliding module.

[0018] Through the above technical solution, the rotation module is able to rotate relatively to the sliding module through the big rotation disk, which facilitates changing the bed sheets.

[0019] Preferably, the rotation assembly comprises a small rotation disk, a top surface of the small rotation disk is fixedly connected with the rotation module, a bottom surface of the small rotation disk is fixedly connected with the sliding module, the sliding module is provided with multiple rotating parts evenly arranged around the small rotation disk, the rotating parts are universal balls or universal wheels.

[0020] Through the above technical solution, the rotating parts are able to expand a rotating area and reduce a size of the small rotation disk, thereby saving materials.

[0021] Preferably, the base is provided with two limiting parts, the two limiting parts are located at an initial position and an end position of the sliding module, respectively.

[0022] Through the above technical solution, when the sliding module is located at the initial position, the rotation module is avoided sliding; when the sliding module is located at the end position, it is convenient for the staff to rotate the rotation module.

[0023] Preferably, the sliding module is provided with two positioning parts symmetrically arranged with respect to the small rotation disk, a bottom surface of the rotation module is provided with positioning slots respectively matched with the positioning parts, and a connection line of the two positioning parts is perpendicular to the sliding direction of the sliding module.

[0024] Through the above technical solution, when the rotation module rotates by 180 degrees, the rotation module and the sliding module are relatively fixed to prevent the rotation module from shaking.

The Beneficial Effects of The Invention

Beneficial Effects

[0025] In summary, the present invention has some beneficial effects as follows.

(1) Through the cooperation of the sliding device and the rotation device, the staff is able to change the bed sheet only by standing in one position, which greatly saves energy and time of the staff.

(2) After changing the bed sheet every time, the mattress is rotated exactly 180 degrees, which is able to extend the life of the mattress.

Brief Description of the Drawings

[0026]

Fig.1 is a side view of a bed frame according to a first preferred embodiment of the present invention. Fig. 2 is an exploded view of the bed frame according

to the first preferred embodiment of the present invention.

Fig. 3 is a structurally schematic view of a base of the bed frame according to the first preferred embodiment of the present invention.

Fig. 4 is structurally schematic view of a sliding module of the bed frame according to the first preferred embodiment of the present invention.

Fig. 5 shows a bottom surface of a rotation module of the bed frame according to the first preferred embodiment of the present invention.

Fig. 6 is a structurally schematic view of a sliding device of the bed frame according to a second preferred embodiment of the present invention.

Fig. 7 is a structurally schematic view of a rotation device of the bed frame according to a third preferred embodiment of the present invention.

Fig. 8 is a structurally schematic view of a rotation device of the bed frame according to a fourth preferred embodiment of the present invention.

[0027] In the drawings, 100: base; 101: headboard; 102: rotation module; 103: sliding module; 104: positioning part; 105: limiting part; 106: positioning slot; 200: sliding device; 201: slide rail; 202: sliding block; 203: slide slot; 204: sliding part; 300: rotation device; 301: rotation assembly; 3011: small rotation disk; 3012: rotating part; 3013: bearing seat; 3014: rotation shaft; 3015: big rotation disk.

Detailed Description of Embodiments

Embodiments of The Invention

[0028] The present invention is further explained in detail with accompanying drawings as follows.

First Embodiment:

[0029] Referring to Fig. 1, a bed frame convenient for changing bed sheets according to a first preferred embodiment of the present invention is illustrated, which comprises a rectangular base 100, wherein a headboard 101 is disposed at one end of the base 100, a rotation module 102 for accommodating a mattress is located above the base 100. According to the first preferred embodiment of the present invention, the rotation module 102 is embodied as a bed board. A sliding module 103 is located between the rotation module 102 and the base 100. According to the first preferred embodiment of the present invention, the sliding module 103 is embodied as a sliding panel. A sliding device 200 is located between the sliding module 103 and the base 100. A rotation device 300 is located between the sliding module 103 and the rotation module 102.

[0030] As shown in Figs. 2 and 3, the sliding device 200 comprises three slide rails 201 parallel to each other. The slide rails 201 are arranged along the length of the

base 100, and the three slide rails 201 are evenly arranged on the base 100. The bottom surface of the rotation module 102 is provided with sliding blocks 202 respectively matched with the slide rails 201; each slide rail 201 is embedded in its matching sliding block 202, so that the rotation module 102 is able to slide along the length direction of the slide rails 201 only by pulling the rotation module 102. Preferably, a length of each of the slide rails 201 is in a range of one-third to two-thirds of the length of the base 100, but it is not limited to this, as long as the rotation module 102 is pulled out and rotated without touching the headboard 101.

[0031] Moreover, the number of the slide rails 201 is not limited to three, two or more are able to be used.

[0032] As shown in Fig. 3, two limiting parts 105 are provided on the base 100 and are located at an initial position and an end position of the sliding module 103, respectively, so that when the sliding module 103 is located at the initial position, the rotation module 102 is avoided sliding, referring to Fig. 2; when the sliding module 103 is located at the end position, it is convenient for a staff to rotate the rotation module 102, referring to Fig. 2. The two limiting parts 105 are embodied as elastic positioning pins.

[0033] Referring to Figs. 2 and 4, the rotation device 300 comprises a rotation assembly 301 located between the sliding module 103 and the rotation module 102, the rotation assembly 301 comprises a small rotation disk 3011, wherein a top surface of the small rotation disk 3011 is fixedly connected to the rotation module 102, a bottom surface of the small rotation disk 3011 is fixedly connected with the sliding module 103. The sliding module 103 is also provided with rotating parts 3012 evenly arranged around the small rotation disk 3011. The rotating parts 3012 are preferably universal balls. Secondly, universal wheels and other similar parts are able to be selected. On the one hand, the rotating parts 3012 are able to support the rotation module 102, and on the other hand, the rotating parts 3012 themselves are able to rotate, which is equivalent to expanding an effective area of the small rotation disk 3011.

[0034] As shown in Figs. 4 and 5, the sliding module 103 is also provided with two symmetrically arranged positioning parts 104, the positioning parts 104 are preferably elastic positioning pins. The bottom surface of the rotation module 102 is provided with positioning slots 106 matched with the two positioning parts 104, respectively. The two positioning parts 104 are symmetrically arranged with respect to the small rotation disk 3011, a connection line of the two positioning parts 104 is perpendicular to a sliding direction of the sliding module 103, so that when the rotation module 102 rotates by 180 degrees, the rotation module 102 and the sliding module 103 are relatively fixed to prevent the rotation module 102 from shaking.

[0035] The specific implementation process of the present invention is as follows. When a bed sheet needs to be changed, the rotation module 102 is pulled in a

direction away from the headboard 101, the rotation module 102 slides along the slide rails 201 through the sliding module 103 till it is convenient for a staff to rotate the rotation module 102, and the rotation module 102 does not touch the headboard 101 during rotation, so that the staff is able to rotate the rotation module 102 only by standing in a fixed position, and insert the bed sheet between the mattress and the rotation module 102, saving time and labor.

Second Embodiment:

[0036] Referring to Fig. 6, a bed frame convenient for changing bed sheets according to a second preferred embodiment of the present invention is illustrated, which is different from the bed frame according to the first preferred embodiment of the present invention in that: the sliding device 200 comprises a slide slot 203 set on the base 100, as shown in Fig. 2, the bottom surface of the rotation module 102 is provided with a sliding part 204 which is able to be embedded in the slide slot 203; the sliding part 204 is a pulley or an universal ball. The slide slot 203 is provided along the length of the base 100, and the number of the slide slot 203 is three; the three slide slots 203 are evenly arranged on the base 100. The number of the slide slots 203 is not limited to three, is able to be set to two or more according to actual needs. In this embodiment, the sliding part 204 is preferably a pulley. The sliding part 204 is able to roll in the slide slot 203. then, the rotation module 102 shown in Fig. 2 is able to slide along the length of the slide slots 203 to be drawn out.

Third Embodiment:

[0037] Referring to Fig. 7, a bed frame convenient for changing bed sheets according to a third preferred embodiment of the present invention is illustrated, which is different from the bed frame according to the first preferred embodiment of the present invention in that: the rotation assembly 301 comprises a bearing seat 3013 located at a center of the sliding module 103, the rotation module 102 is provided with a rotation shaft 3014 rotatably connected with the bearing seat 3013, so that the rotation module 102 is able to rotate to facilitate changing the bed sheets.

Fourth Embodiment:

[0038] Referring to Fig. 8, a bed frame convenient for changing bed sheets according to a fourth preferred embodiment of the present invention is illustrated, which is different from the bed frame according to the first preferred embodiment of the present invention in that: the rotation assembly 301 comprises a big rotation disk 3015, a top surface of the big rotation disk 3015 is fixedly connected with rotation module 102, a bottom surface of the big rotation disk 3015 is fixedly connected with the sliding

module 103. The rotation module 102 is able to rotate through the big rotation disk 3015 to facilitate changing the bed sheets.

[0039] The above-mentioned embodiments are only an explanation of the present invention, and are not a limitation of the present invention. After reading this specification, those skilled in the art are able to make modifications to these embodiments without creative contribution as required, all of which fall within the protective scope of the present invention.

Claims

1. A bed frame convenient for changing bed sheets, the bed frame comprising:

a base (100);
 a rotation module (102) for accommodating a mattress located above the base (100);
 a sliding module (103) located between the rotation module (102) and the base (100);
 a sliding device(200) located between the sliding module (103) and the base (100), wherein the sliding module (103) is able to slide along a length of the base (100) through the sliding device (200);and
 a rotation device (300) located between the sliding module (103) and the rotation module (102), wherein the rotation module (102) is able to rotate around a central axis of the sliding module(103) through the rotation device (300).

2. The bed frame convenient for changing the bed sheets according to claim 1, wherein the sliding device(200) comprises a slide rail (201) on the base (100), a sliding block (202) matched with the slide rail (201) is located at a bottom surface of the rotation module (102), and wherein the slide rail (201) is arranged along the length direction of the base (100); the number of the slide rail (201) is at least two.

3. The bed frame convenient for changing the bed sheets according to claim 1, wherein the sliding device(200) comprises a slide slot (203) on the base (100), a sliding part (204) which is able to be embedded and roll in the slide slot (203) is located at a bottom surface of the rotation module (102), and wherein the sliding part (204) is a pulley or an universal ball, the slide slot (203) is arranged along the length direction of the base; the number of the slide slot (203) is at least two.

4. The bed frame convenient for changing the bed sheets according to claim 2 or 3, wherein the rotation device(300) comprises a rotation assembly(301) located between the sliding module (103) and the rotation module (102), the rotation module (102) ro-

tates through the rotation assembly (301).

5. The bed frame convenient for changing the bed sheets according to claim 4, wherein the rotation assembly(301) comprises a bearing seat (3013) located on the sliding module (103), and a rotation shaft (3014) rotatably connected with the bearing seat (3013) and located on the rotation module (102).
6. The bed frame convenient for changing the bed sheets according to claim 4, wherein the rotation assembly(301) comprises a big rotation disk (3015), wherein a top surface of the big rotation disk (3015) is fixedly connected with rotation module (102), a bottom surface of the big rotation disk (3015) is fixedly connected with the sliding module (103).
7. The bed frame convenient for changing the bed sheets according to claim 4, wherein the rotation assembly(301) comprises a small rotation disk(3011) and multiple rotating parts (3012), a top surface of the small rotation disk (3011) is fixedly connected with the rotation module (102), a bottom surface of the small rotation disk (3011) is fixedly connected with the sliding module (103), the rotating parts (3012) evenly arranged around the small rotation disk (3011) are provided on the sliding module (103), the rotating parts (3012) are universal balls or universal wheels.
8. The bed frame convenient for changing the bed sheets according to claim 1, wherein two limiting parts (105) are provided on the base (100), and are located at an initial position and an end position of the sliding module (103), respectively.
9. The bed frame convenient for changing the bed sheets according to claim 7, wherein two positioning parts (104) are symmetrically arranged with respect to the small rotation disk (3011) on the sliding module (103), positioning slots (106) respectively matching the positioning parts (104) are provided on the bottom surface of the rotation module (102), a connection line of the two positioning parts (104) is perpendicular to a slide direction of the sliding module (103).

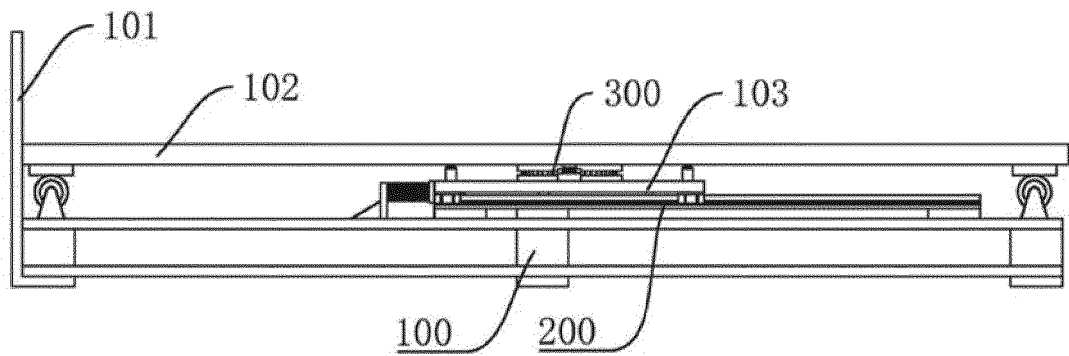


FIG. 1

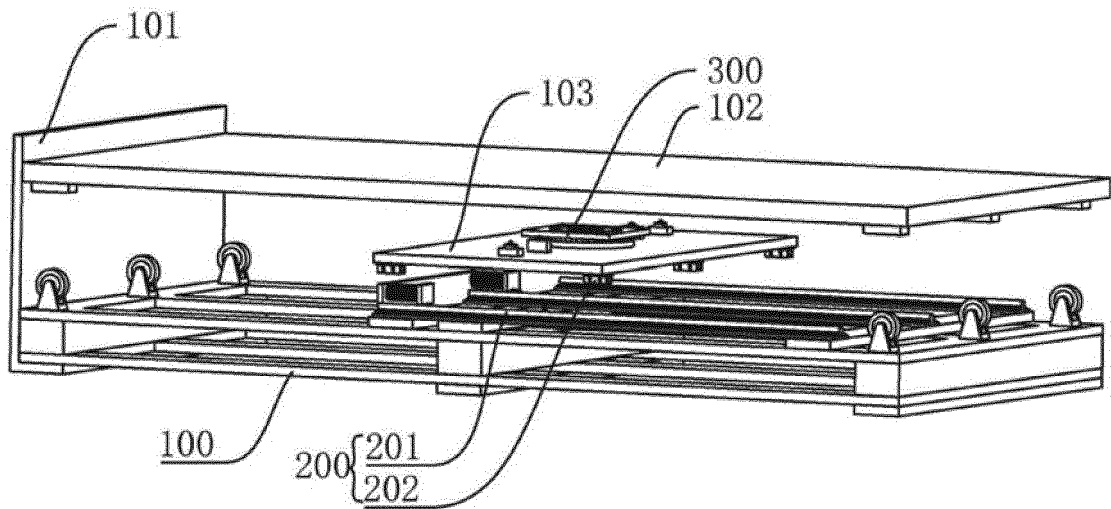


FIG. 2

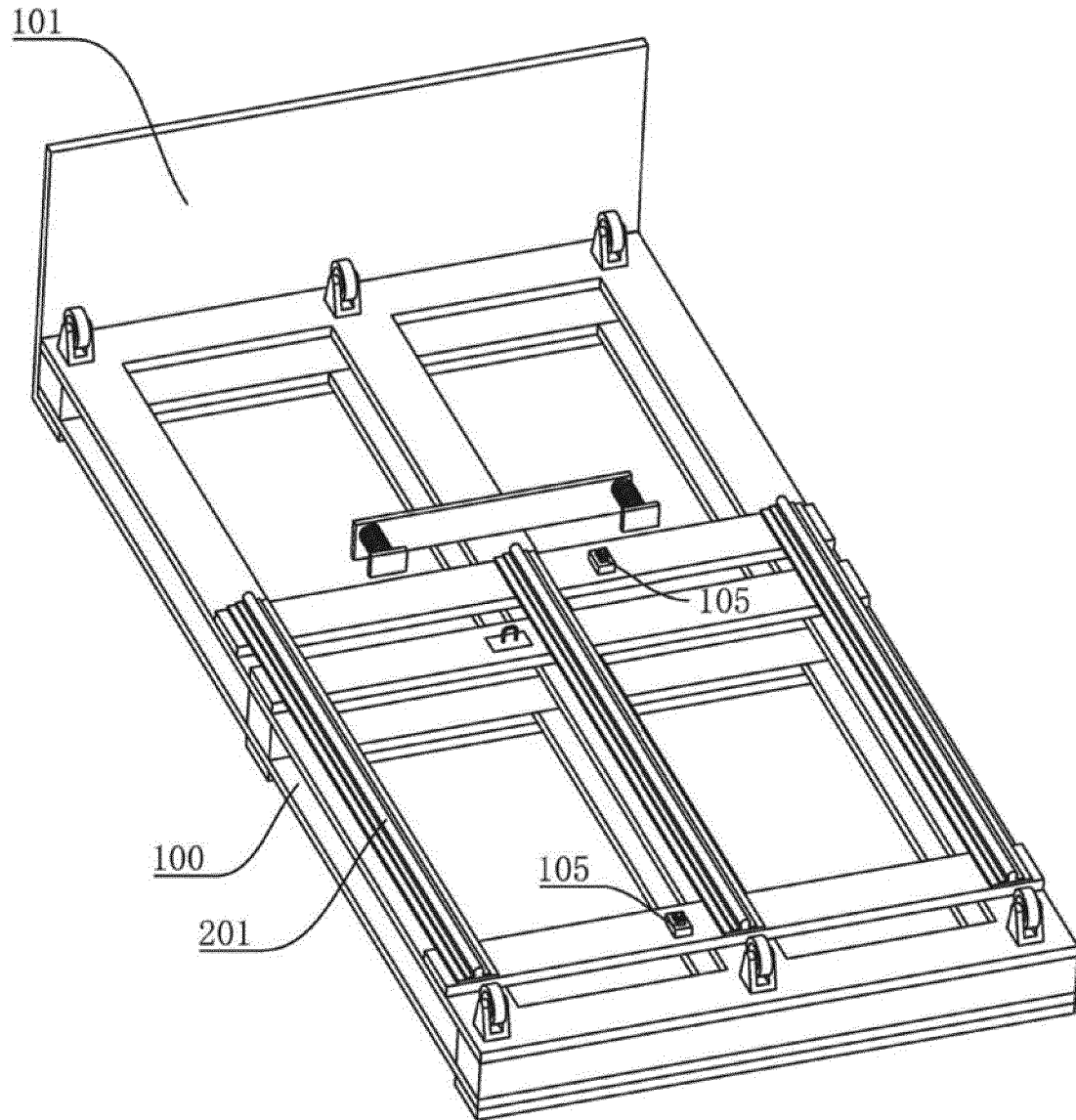


FIG. 3

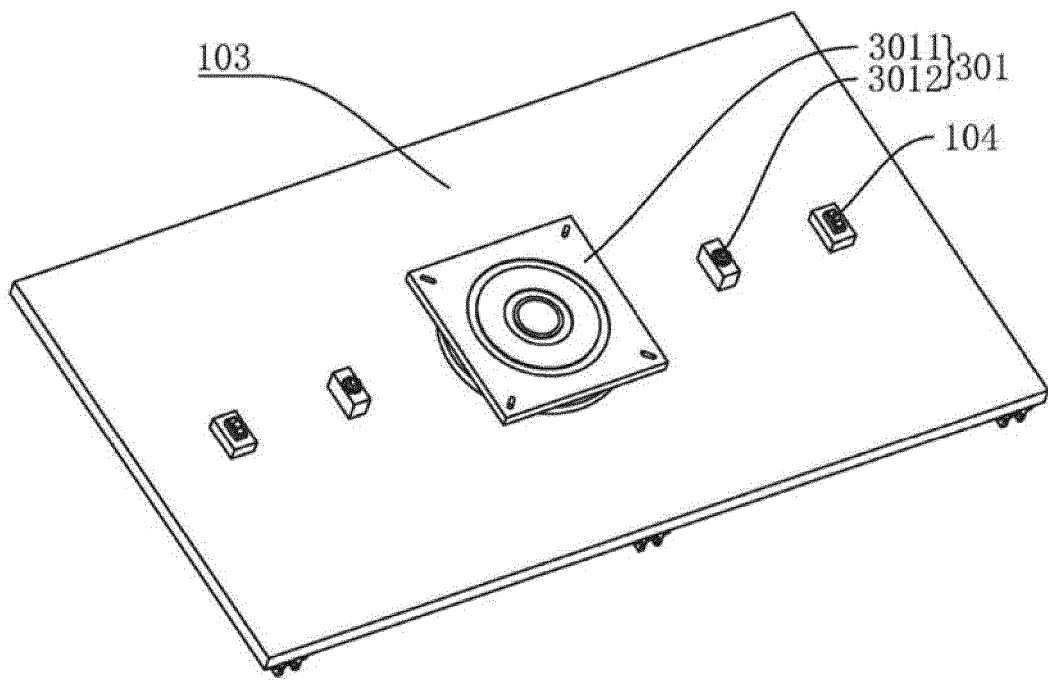


FIG. 4

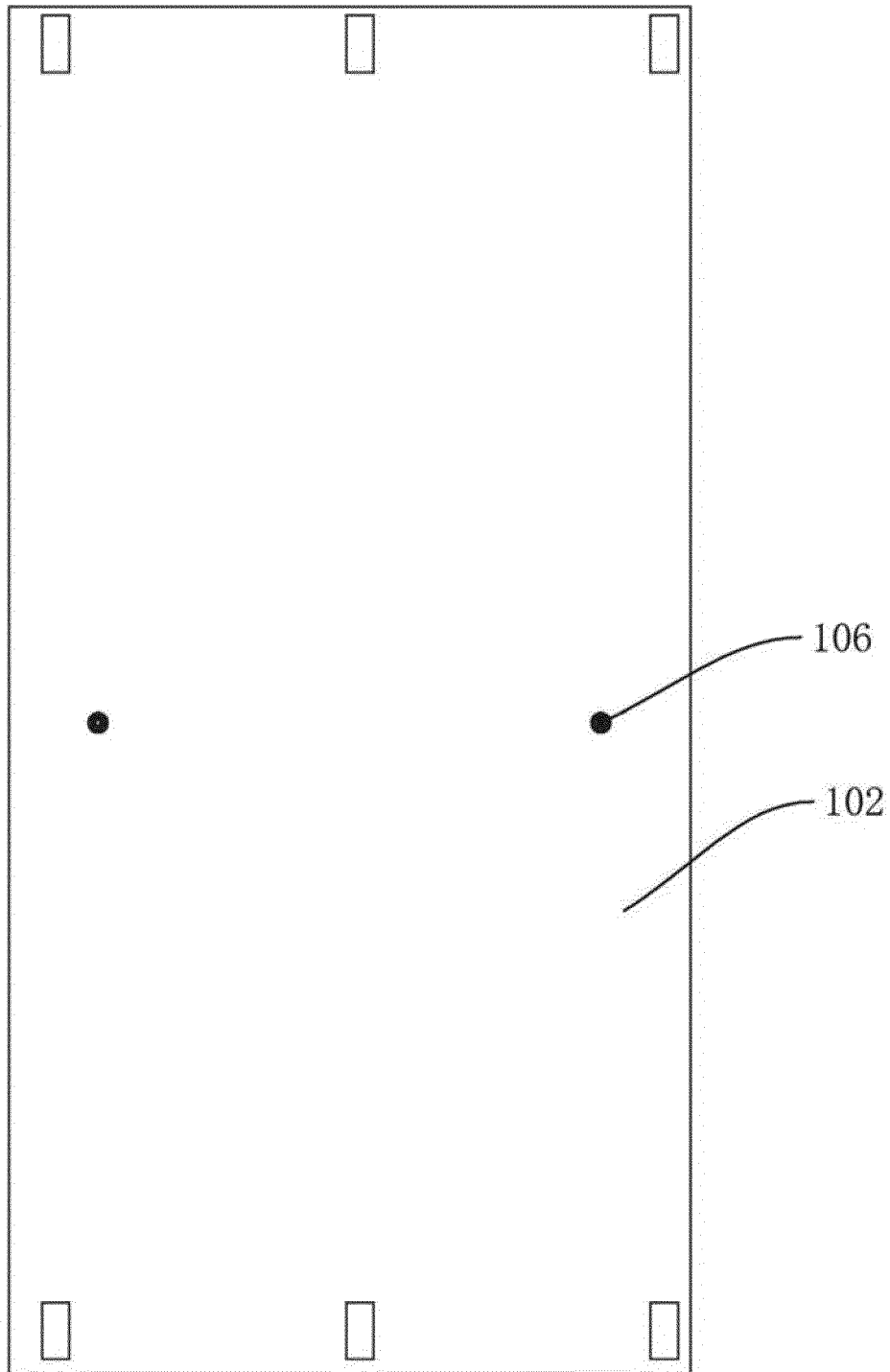


FIG. 5

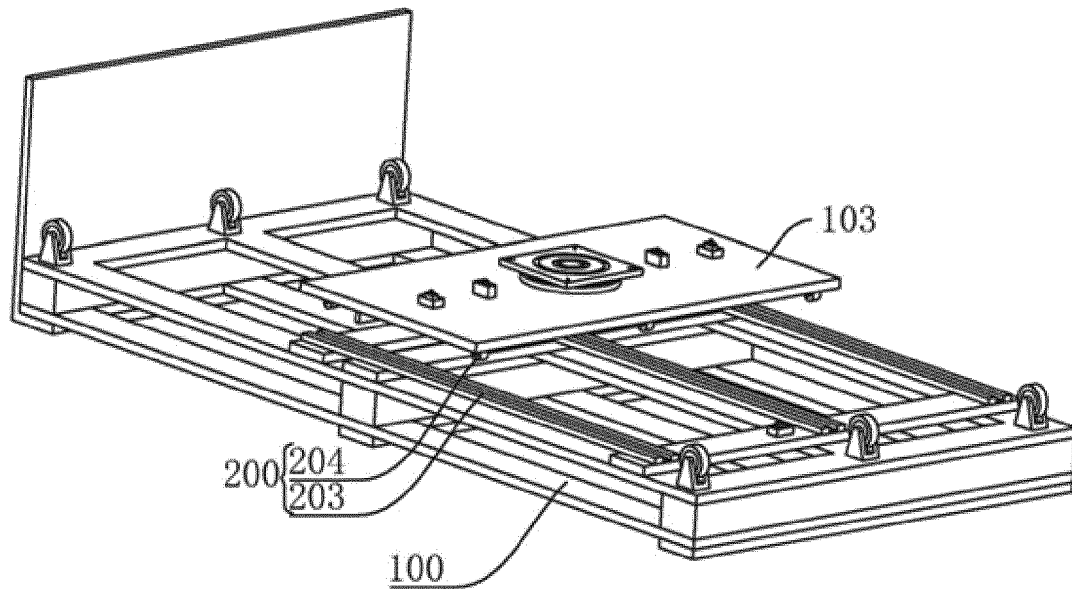


FIG. 6

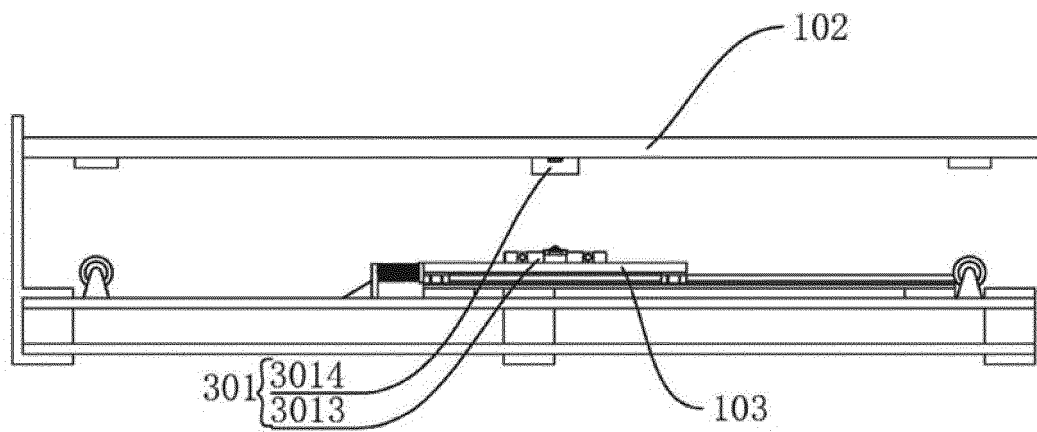


FIG. 7

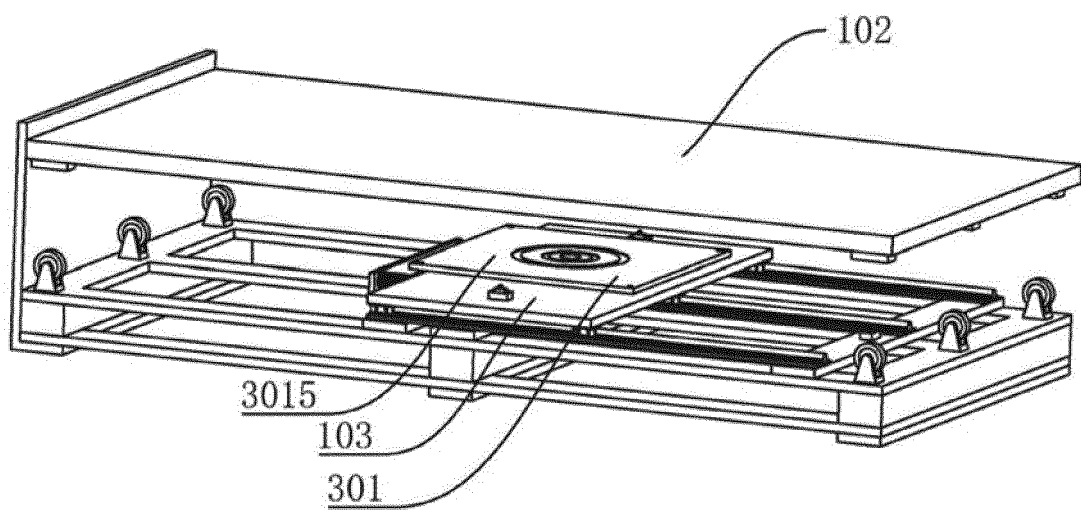


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/083387

A. CLASSIFICATION OF SUBJECT MATTER

A47C 19/02(2006.01)i; A47C 19/22(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)

A47C

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)

CNPAT; CNKI; WPI; EPODOC: 滑动, 滑移, 床架, 旋转, 床板, 换床单, 滑轨, 万向, slid+, slip+, bedstead, rotat+, bed board, bedplate, exchang+, sheet+, glid+, orbit, path, railway, track, universal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 203815016 U (VIENNA HOTEL CO., LTD.) 10 September 2014 (2014-09-10) description, paragraphs [0018]-[0021], and figures 1-3	1-9
Y	CN 202751057 U (WANG, TINGYI) 27 February 2013 (2013-02-27) description, paragraphs [0018]-[0026], and figures 1-4	1-9
PX	CN 208610313 U (WUXI LONGHE FURNITURE MANUFACTURING CO., LTD.) 19 March 2019 (2019-03-19) entire document	1-9
A	CN 2754470 Y (WHITE HORSE INSTRUMENT (GUANGDONG) LIMITED) 01 February 2006 (2006-02-01) entire document	1-9
A	CN 2332259 Y (LI, JIANGUO) 11 August 1999 (1999-08-11) entire document	1-9
A	CN 2659252 Y (TAN, JIAJU ET AL.) 01 December 2004 (2004-12-01) entire document	1-9
A	CN 201550951 U (LI, YANG) 18 August 2010 (2010-08-18) entire document	1-9

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

26 June 2019

Date of mailing of the international search report

18 July 2019

Name and mailing address of the ISA/CN

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/083387

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2017231400 A1 (PATRONAGGIO, C.) 17 August 2017 (2017-08-17) entire document	1-9

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/083387

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 203815016 U	10 September 2014	None	
CN 202751057 U	27 February 2013	CN 103381035 B	20 January 2016
		CN 103381035 A	06 November 2013
CN 208610313 U	19 March 2019	CN 108542183 A	18 September 2018
CN 2754470 Y	01 February 2006	None	
CN 2332259 Y	11 August 1999	None	
CN 2659252 Y	01 December 2004	None	
CN 201550951 U	18 August 2010	None	
US 2017231400 A1	17 August 2017	US 10021990 B2	17 July 2018

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 203815016 U [0003]