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**NURSING DEVICE FOR PATIENTS WITH MULTIPLE MYELOMA.**

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The invention belongs to the technical field of medical devices, and particularly relates to a nursing device for patients with multiple myeloma, comprising a bedplate, wherein four corners of the bottom of the bedplate are fixedly connected with support legs, and the support legs are vertically arranged; an arm unfolding mechanism is arranged at the bottom side of the front end of the bedplate, a slot is formed in the middle of the bedplate, the inner side of the slot is fixedly connected with a waist support structure, the back end of the bedplate is provided with a leg support structure, the bottom end of the bedplate is fixedly connected with a controller, and the controller is electrically connected with the arm unfolding mechanism and the waist support structure. By utilizing these structures, a nursing tool for multiple myeloma patients has been implemented that can protect the patient's waist while stably controlling the limbs.

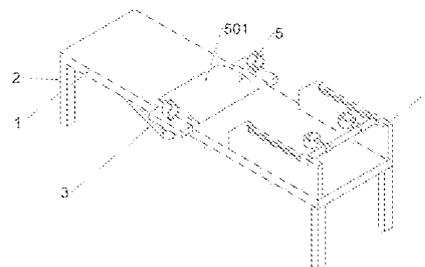


FIG. 1

## NURSING DEVICE FOR PATIENTS WITH MULTIPLE MYELOMA

### TECHNICAL FIELD

The invention belongs to the technical field of medical devices, and particularly  
5 relates to a nursing device for patients with multiple myeloma.

### BACKGROUND

Multiple myeloma is a malignant plasma cell disease that occurs in B  
lymphocytes, and usually occurs in middle-aged and elderly people over 40 years old.  
10 The misdiagnosis rate of this disease is very high. Patients can be misdiagnosed as  
respiratory infection, nephritis and osteopathy due to fever, urine changes, and low  
back and leg pain. The common symptoms are bone pain, bone deformation,  
pathological fracture, anaemia, haemorrhage, liver and spleen, lymph nodes, renal  
diseases, nervous system symptoms, infection, renal function damage, hyperviscosity  
15 syndrome and amyloidosis.

Nursing care of bone pain in multiple myeloma includes bed rest, giving  
painkillers to patients with severe pain, while patients with pathological fractures  
should not bend over and do strenuous exercise, and engage in passive limb activities  
during bed rest. At present, patients with pathological fractures in multiple myeloma  
20 usually need medical staff or their families to engage in passive limb activities during  
bed rest, which causes a great amount of tasks for medical staff or their families. And  
the waist of the patient need to be protected when passive limb activity are performed  
on the patient, so as to avoid bending and twisting the waist; and the prior art is not  
convenient to protect and limit the waist of the patient when passive limb activities  
25 are performed on the patient, so the invention provides a device capable of protecting  
the waist of the patient and passively moving the limbs of the patient to meet the  
existing requirements.

## SUMMARY

The purpose of the present invention is to provide a nursing device for patients with multiple myeloma, so as to solve the above problems and protect the waist of patients and controlling the limbs stably.

5 In order to achieve the above objectives, the present invention provides the following scheme.

A nursing device for patients with multiple myeloma comprises a bedplate, wherein four corners of the bottom of the bedplate are fixedly connected with support legs, and the support legs are vertically arranged; an arm unfolding mechanism is  
10 arranged at the bottom side of the front end of the bedplate, a slot is formed in the middle of the bedplate, the inner side of the slot is fixedly connected with a waist support structure, the back end of the bedplate is provided with a leg support structure, the bottom end of the bedplate is fixedly connected with a controller, and the controller is electrically connected with the arm unfolding mechanism and the waist  
15 support structure.

Optionally, the arm unfolding mechanism comprises a sliding seat, the sliding seat is connected with the bottom of the bedplate in a sliding way, and the front end of the sliding seat is fixedly connected with the output shaft of a telescopic cylinder, the telescopic cylinder is fixedly connected with the bottom end of the bedplate;

20 the inner side of the sliding seat is fixedly connected with a plurality of sliding bars, and the outer sides of the sliding bars are slidably connected with the same sliding plate, the sliding plate is connected with the bottom of the bedplate in a sliding way, two ends of the sliding plate are respectively rotatably connected with a rotating arm, and the top end of one end of the rotating arm far away from the sliding plate is  
25 rotatably connected with a hand clamping sleeve;

pressure sensing structures are arranged between the front and rear sides of the sliding plate and the inner side of the sliding seat, and the telescopic cylinder and the pressure sensing structure are electrically connected with the controller.

Optionally, the pressure sensing structure comprises a spring, spring is sleeved  
30 outside the sliding bar, one end of the spring is fixedly connected with the sliding

plate, the other end of the spring is fixedly connected with a pressure sensing head, the pressure sensing head is fixedly connected with the inner side of the sliding seat and electrically connected with the controller.

Optionally, the bottom end of the bedplate is provided with a sliding groove, the top end of the sliding seat is fixedly connected with a seat protrusion, the top end of the sliding plate is fixedly connected with a sliding plate protrusion, and the sliding seat protrusion and the sliding plate protrusion are respectively connected with the sliding groove in a sliding way.

Optionally, the waist support structure comprises a support plate, the support plate is fixedly connected with the bedplate, the top end of the support plate is fixedly connected with an air bag, the air bag is matched with the slot, the bottom end of the airbag is fixedly communicated with an inflator through a communication gas pipe, the inflator is fixedly connected with the bottom end of the bedplate, and the inflator is electrically connected with the controller.

Optionally, the leg support structure comprises side plates fixedly connected with the left and right sides of the bedplate, the side plates are vertically arranged with the bedplate, the top end of the side plates is slidably connected with a sliding block, the two sliding blocks are fixedly connected with the same connecting rod, the axis of the connecting rod is vertical to the sliding blocks, two sliding sleeves are slidably connected outside the connecting rod, and one end of the sliding sleeve far from the connecting rod is rotatably connected with a foot clamping sleeve.

Optionally, the top end of the side plate is fixedly connected with a slide rail, and the bottom end of the sliding block is provided with a chute, the chute is in sliding connection with the slide rail.

Compared with the prior art, the invention has the following advantages and technical effects.

By setting the arm unfolding mechanism, patients can be well adapted to arm stretching and training; by setting the waist support structure, patients' waist can be supported, so as to protect patients' back from twisting during exercise, and the stability of patients can be further improved; by setting the leg support structure,

patients can be well adapted to the support and protection of legs, and patients can be allowed to fold their legs to obtain a more comfortable posture.

By using these structures, a nursing tool for patients with multiple myeloma can be realized, which can protect the waist of patients and control the limbs stably at the same time.

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

In order to explain the embodiments of the present invention or the technical scheme in the prior art more clearly, the drawings needed in the embodiments will be briefly introduced below. Obviously, the drawings in the following description are only some embodiments of the present invention. For ordinary people in the field, other drawings can be obtained according to these drawings without paying creative labour.

FIG. 1 is a schematic structural diagram of the present invention;

FIG. 2 is a schematic structural view of the other side of the present invention;

FIG. 3 is a structural schematic diagram of the leg support structure;

FIG. 4 is a schematic structural diagram of the arm deployment mechanism;

FIG. 5 is an enlarged schematic view of part a in fig. 4;

FIG. 6 is the structural schematic diagram of the bed board.

1. bedplate; 2. support leg; 3. arm unfolding mechanism; 5. waist support structure; 6. leg support structure; 101. sliding groove; 102. slot; 301. sliding seat; 302. sliding plate; 303. sliding bar; 304. spring; 305. rotating arm; 307. hand clamping sleeve; 308. telescopic cylinder; 309. controller; 310. sliding seat protrusion; 311. sliding plate protrusion; 312. pressure sensing head; 501. airbag; 502. support plate; 503. communication gas pipe; 504. inflator; 601. side plate; 602. sliding block; 603. connecting rod; 604. sliding sleeve; 605. foot clamping sleeve; 606. slide rail.

### **DESCRIPTION OF THE INVENTION**

In the following, the technical scheme in the embodiment of the invention will be clearly and completely described with reference to the attached drawings. Obviously,

the described embodiment is only a part of the embodiment of the invention, but not the whole embodiment. Based on the embodiments in the present invention, all other embodiments obtained by ordinary technicians in the field without creative labour belong to the scope of protection of the present invention.

5 In order to make the above objects, features and advantages of the present invention more obvious and easier to understand, the present invention will be further described in detail with the attached drawings and specific embodiments.

Referring to figs. 1 to 6, a nursing device for patients with multiple myeloma comprises a bedplate 1, wherein four corners of the bottom of the bedplate 1 are  
10 fixedly connected with support legs 2, and the support legs 2 are vertically arranged; an arm unfolding mechanism 3 is arranged at the bottom side of the front end of the bedplate 1, a slot 102 is formed in the middle of the bedplate 1, the inner side of the slot 102 is fixedly connected with a waist support structure 5, the back end of the bedplate 1 is provided with a leg support structure 6, the bottom end of the bedplate 1  
15 is fixedly connected with a controller 309, and the controller 309 is electrically connected with the arm unfolding mechanism 3 and the waist support structure 5.

The arm unfolding mechanism 3 can be well adapted to the patient's arm stretching exercise and training; the waist supporting structure 5 can provide support for the patient's waist to protect the patient's back from twisting during exercise,  
20 which can further improve the stability of the patient; and the leg supporting structure 6 can be well adapted to the support and protection of the legs and allow the patient to fold his legs to obtain a more comfortable posture.

Further, the arm unfolding mechanism 3 comprises a sliding seat 301, the sliding seat 301 is connected with the bottom of the bedplate 1 in a sliding way, and the front  
25 end of the sliding seat 301 is fixedly connected with the output shaft of a telescopic cylinder 308, the telescopic cylinder 308 is fixedly connected with the bottom end of the bedplate 1;

the inner side of the sliding seat 301 is fixedly connected with a plurality of sliding bars 303, and the outer sides of the sliding bars 303 are slidably connected  
30 with the same sliding plate 302, the sliding plate 302 is connected with the bottom of

the bedplate 1 in a sliding way, two ends of the sliding plate 302 are respectively rotatably connected with a rotating arm 305, and the top end of one end of the rotating arm 305 far away from the sliding plate 302 is rotatably connected with a hand clamping sleeve 307;

5 pressure sensing structures are arranged between the front and rear sides of the sliding plate 302 and the inner side of the sliding seat 301, and the telescopic cylinder 308 and the pressure sensing structure are electrically connected with the controller 309.

Further, the pressure sensing structure comprises a spring 304, spring 304 is  
10 sleeved outside the sliding bar 303, one end of the spring 304 is fixedly connected with the sliding plate 302, the other end of the spring 304 is fixedly connected with a pressure sensing head 312, the pressure sensing head 312 is fixedly connected with the inner side of the sliding seat 301 and electrically connected with the controller 309.

15 When in use, when the patient stretches his arms, the position of the shoulder will be different due to the different height and body shape of the human body. Therefore, when the position of the sliding plate 302 does not match the shoulder of the patient, the sliding plate 302 will be offset when the patient rotates the hand clamping sleeve 307. At this time, the pressure sensing head 312 senses the change of  
20 the pressure reading, and the position of the sliding seat 301 can be finely adjusted by driving the telescopic cylinder 308 through the controller 309 to adapt to the position of the shoulder of the patient.

Further, the bottom end of the bedplate 1 is provided with a sliding groove 101, the top end of the sliding seat 301 is fixedly connected with a seat protrusion 310, the  
25 top end of the sliding plate 302 is fixedly connected with a sliding plate protrusion 311, and the sliding seat protrusion 310 and the sliding plate protrusion 311 are respectively connected with the sliding groove 101 in a sliding way.

The arrangement of the sliding seat protrusion 310 and the sliding plate protrusion 311 can ensure that the sliding seat 301 and the sliding plate 302 can slide  
30 stably in a fixed direction.

Further, the waist support structure 5 comprises a support plate 502, the support plate 502 is fixedly connected with the bedplate 1, the top end of the support plate 502 is fixedly connected with an air bag 501, the air bag 501 is matched with the slot 102, the bottom end of the airbag 501 is fixedly communicated with an inflator 504 through a communication gas pipe 503, the inflator 504 is fixedly connected with the bottom end of the bedplate 1, and the inflator 504 is electrically connected with the controller 309. When the airbag 501 is inflated, it can support the patient's waist. After the patient's waist part is lifted, the body is naturally not easy to turn over, and the injury to the patient's waist is less when the airbag 501 is lifted, and the patient is more comfortable because of the slow inflation.

Further, the leg support structure 6 comprises side plates 601 fixedly connected with the left and right sides of the bedplate 1, the side plates 601 are vertically arranged with the bedplate 1, the top end of the side plates 601 is slidably connected with a sliding block 602, the two sliding blocks 602 are fixedly connected with the same connecting rod 603, the axis of the connecting rod 603 is vertical to the sliding blocks 602, two sliding sleeves 604 are slidably connected outside the connecting rod 603, and one end of the sliding sleeve 604 far from the connecting rod 603 is rotatably connected with a foot clamping sleeve 605. The foot clamping sleeve 605 can fix the patient's legs downward or toward the front to help the patient fold their legs and get a more comfortable posture.

Further, the top end of the side plate 601 is fixedly connected with a slide rail 606, and the bottom end of the sliding block 602 is provided with a chute, the chute is in sliding connection with the slide rail 606.

In the description of the present invention, it should be understood that the terms "vertical", "horizontal", "up", "down", "front", "back", "left", "right", "vertical", "horizontal", "top", "bottom", "inside", "outside", and other indications of orientation or positional relationships are based on the orientation or positional relationships shown in the accompanying drawings, solely for the convenience of describing the present invention, Rather than indicating or implying that the device or component

referred to must have a specific orientation, be constructed and operated in a specific orientation, therefore it cannot be understood as a limitation of the present invention.

The above described embodiments are only a description of the preferred method of the present invention and do not limit the scope of the present invention. Without  
5 departing from the design spirit of the present invention, various modifications and improvements made by ordinary technical personnel in the field to the technical solution of the present invention should fall within the scope of protection determined in the claims of the present invention.

**CLAIMS**

1. A nursing device for patients with multiple myeloma, comprising a bedplate (1), wherein four corners of the bottom of the bedplate (1) are fixedly connected with support legs (2), and the support legs (2) are vertically arranged; an arm unfolding mechanism (3) is arranged at the bottom side of the front end of the bedplate (1), a slot (102) is formed in the middle of the bedplate (1), the inner side of the slot (102) is fixedly connected with a waist support structure (5), the back end of the bedplate (1) is provided with a leg support structure (6), the bottom end of the bedplate (1) is fixedly connected with a controller (309), and the controller (309) is electrically connected with the arm unfolding mechanism (3) and the waist support structure (5).

2. The nursing device for patients with multiple myeloma according to claim 1, characterized in that the arm unfolding mechanism (3) comprises a sliding seat (301), the sliding seat (301) is connected with the bottom of the bedplate (1) in a sliding way, and the front end of the sliding seat (301) is fixedly connected with the output shaft of a telescopic cylinder (308), and the telescopic cylinder (308) is fixedly connected with the bottom end of the bedplate (1);

the inner side of the sliding seat (301) is fixedly connected with a plurality of sliding bars (303), the outer sides of the sliding bars (303) are slidably connected with the same sliding plate (302), the sliding plate (302) is connected with the bottom of the bedplate (1) in a sliding way, two ends of the sliding plate (302) are respectively rotatably connected with a rotating arm (305), and the top end of one end of the rotating arm (305) far away from the sliding plate (302) is rotatably connected with a hand clamping sleeve (307);

pressure sensing structures are arranged between the front and rear sides of the sliding plate (302) and the inner side of the sliding seat (301), and the telescopic cylinder (308) and the pressure sensing structure are electrically connected with the controller (309).

3. The nursing device for patients with multiple myeloma according to claim 2, characterized in that the pressure sensing structure comprises a spring (304), spring (304) is sleeved outside the sliding bar (303), one end of the spring (304) is fixedly

connected with the sliding plate (302), the other end of the spring (304) is fixedly connected with a pressure sensing head (312), the pressure sensing head (312) is fixedly connected with the inner side of the sliding seat (301) and electrically connected with the controller (309).

5           4. The nursing device for patients with multiple myeloma according to claim 3, characterized in that the bottom end of the bedplate (1) is provided with a sliding groove (101), the top end of the sliding seat (301) is fixedly connected with a sliding seat protrusion (310), the top end of the sliding plate (302) is fixedly connected with a sliding plate protrusion (311), and the sliding seat protrusion (310) and the sliding  
10 plate protrusion (311) are respectively connected with the sliding groove (101) in a sliding way.

          5. The nursing device for patients with multiple myeloma according to claim 1, characterized in that the waist support structure (5) comprises a support plate (502), the support plate (502) is fixedly connected with the bedplate (1), the top end of the  
15 support plate (502) is fixedly connected with an air bag (501), the air bag (501) is matched with the slot (102), the bottom end of the airbag (501) is fixedly communicated with an inflator (504) through a communication gas pipe (503), the inflator (504) is fixedly connected with the bottom end of the bedplate (1), and the inflator (504) is electrically connected with the controller (309).

20           6. The nursing device for patients with multiple myeloma according to claim 1, characterized in that the leg support structure (6) comprises side plates (601) fixedly connected with the left and right sides of the bedplate (1), the side plates (601) are vertically arranged with the bedplate (1), the top end of the side plates (601) is slidably connected with a sliding block (602), the two sliding blocks (602) are fixedly  
25 connected with the same connecting rod (603), the axis of the connecting rod (603) is vertical to the sliding blocks (602), two sliding sleeves (604) are slidably connected outside the connecting rod (603), and one end of the sliding sleeve (604) far from the connecting rod (603) is rotatably connected with a foot clamping sleeve (605).

          7. The nursing device for patients with multiple myeloma according to claim 6,  
30 characterized in that the top end of the side plate (601) is fixedly connected with a

slide rail (606), and the bottom end of the sliding block (602) is provided with a chute, and the chute is in sliding connection with the slide rail (606).

**PATENTANSPRÜCHE**

1. Eine Pflegevorrichtung für Patienten mit multiplem Myelom, umfassend eine Bettplatte (1), wobei vier Ecken des Bodens der Bettplatte (1) fest mit Stützbeinen (2) verbunden sind und die Stützbeine (2) vertikal angeordnet sind; ein  
5 Arm-Entfaltungsmechanismus (3) ist an der Unterseite des vorderen Endes der Bettplatte (1) angeordnet, ein Schlitz (102) ist in der Mitte der Bettplatte (1) ausgebildet, die Innenseite des Schlitzes (102) ist fest mit einer Taillenstützstruktur (5) verbunden, das hintere Ende der Bettplatte (1) ist mit einer Beinstützstruktur (6) versehen, das untere Ende der Bettplatte (1) ist fest mit einem Steuergerät (309)  
10 verbunden, und das Steuergerät (309) ist elektrisch mit dem Arm-Entfaltungsmechanismus (3) und der Taillenstützstruktur (5) verbunden.

2. Die Pflegevorrichtung für Patienten mit multiplem Myelom nach Anspruch 1, dadurch gekennzeichnet, dass der Arm-Entfaltungsmechanismus (3) einen Gleitsitz (301) umfasst, der Gleitsitz (301) gleitend mit dem Boden der Bettplatte (1)  
15 verbunden ist und das vordere Ende des Gleitsitzes (301) fest mit der Ausgangswelle eines Teleskopzylinders (308) verbunden ist, und der Teleskopzylinder (308) fest mit dem unteren Ende der Bettplatte (1) verbunden ist;

die Innenseite des Gleitsitzes (301) ist fest mit einer Vielzahl von Gleitstäben (303) verbunden, die Außenseiten der Gleitstäbe (303) sind gleitend mit derselben  
20 Gleitplatte (302) verbunden, die Gleitplatte (302) ist gleitend mit dem Boden der Grundplatte (1) verbunden, zwei Enden der Gleitplatte (302) sind jeweils drehbar mit einem Dreharm (305) verbunden und das obere Ende eines von der Gleitplatte (302) entfernten Endes des Dreharms (305) drehbar mit einer Handklemmhülse (307) verbunden ist;

25 zwischen der Vorder- und Rückseite der Gleitplatte (302) und der Innenseite des Gleitsitzes (301) sind Druckmessstrukturen angeordnet, und der Teleskopzylinder (308) und die Druckmessstruktur sind elektrisch mit dem Steuergerät (309) verbunden.

3. Die Pflegevorrichtung für Patienten mit multiplem Myelom nach Anspruch 2, dadurch gekennzeichnet, dass die Druckmessstruktur eine Feder (304) umfasst, die  
30

Feder (304) außerhalb des Gleitstabs (303) ummantelt ist, ein Ende der Feder (304) fest mit der Gleitplatte (302) verbunden ist, das andere Ende der Feder (304) fest mit einem Druckmesskopf (312) verbunden ist, der Druckmesskopf (312) fest mit der Innenseite des Gleitsitzes (301) verbunden ist und elektrisch mit dem Steuergerät (309) verbunden ist.

4. Die Pflegevorrichtung für Patienten mit multiplem Myelom nach Anspruch 3, dadurch gekennzeichnet, dass das untere Ende der Bettplatte (1) mit einer Gleitrille (101) versehen ist, das obere Ende des Gleitsitzes (301) fest mit einem Gleitsitzvorsprung (310) verbunden ist, das obere Ende der Gleitplatte (302) fest mit einem Gleitplattenvorsprung (311) verbunden ist, und der Gleitsitzvorsprung (310) und der Gleitplattenvorsprung (311) jeweils gleitend mit der Gleitrille (101) verbunden sind.

5. Die Pflegevorrichtung für Patienten mit multiplem Myelom nach Anspruch 1, dadurch gekennzeichnet, dass die Taillenstützstruktur (5) eine Stützplatte (502) umfasst, die Stützplatte (502) fest mit der Bettplatte (1) verbunden ist, das obere Ende der Stützplatte (502) fest mit einem Airbag (501) verbunden ist, der Airbag (501) an den Schlitz (102) angepasst ist, das untere Ende des Airbags (501) fest mit einer Aufblasvorrichtung (504) durch eine Verbindungsgasleitung (503) verbunden ist, die Aufblasvorrichtung (504) fest mit dem unteren Ende der Bettplatte (1) verbunden ist und die Aufblasvorrichtung (504) elektrisch mit dem Steuergerät (309) verbunden ist.

6. Die Pflegevorrichtung für Patienten mit multiplem Myelom nach Anspruch 1, dadurch gekennzeichnet, dass die Beinstützstruktur (6) Seitenplatten (601) umfasst, verbunden fest mit der linken und rechten Seite der Bettplatte (1), die Seitenplatten (601) vertikal mit der Bettplatte (1) angeordnet sind und das obere Ende der Seitenplatten (601) verschiebbar mit einem Gleitblock (602) verbunden ist, die beiden Gleitblöcke (602) fest mit der gleichen Verbindungsstange (603) verbunden sind, die Achse der Verbindungsstange (603) senkrecht zu den Gleitblöcke (602) steht, zwei Schiebehülsen (604) außerhalb der Verbindungsstange (603) gleitend verbunden sind, und ein von der Verbindungsstange (603) entferntes Ende der Schiebehülse (604) drehbar mit einer Fußklemmhülse (605) verbunden ist.

7. Die Pflegevorrichtung für Patienten mit multiplem Myelom nach Anspruch 6, dadurch gekennzeichnet, dass das obere Ende der Seitenplatte (601) fest mit einer Gleitschiene (606) verbunden ist und das untere Ende des Gleitblocks (602) mit einer Rutsche versehen ist, und die Rutsche in Gleitverbindung mit der Gleitschiene (606)
- 5 steht.

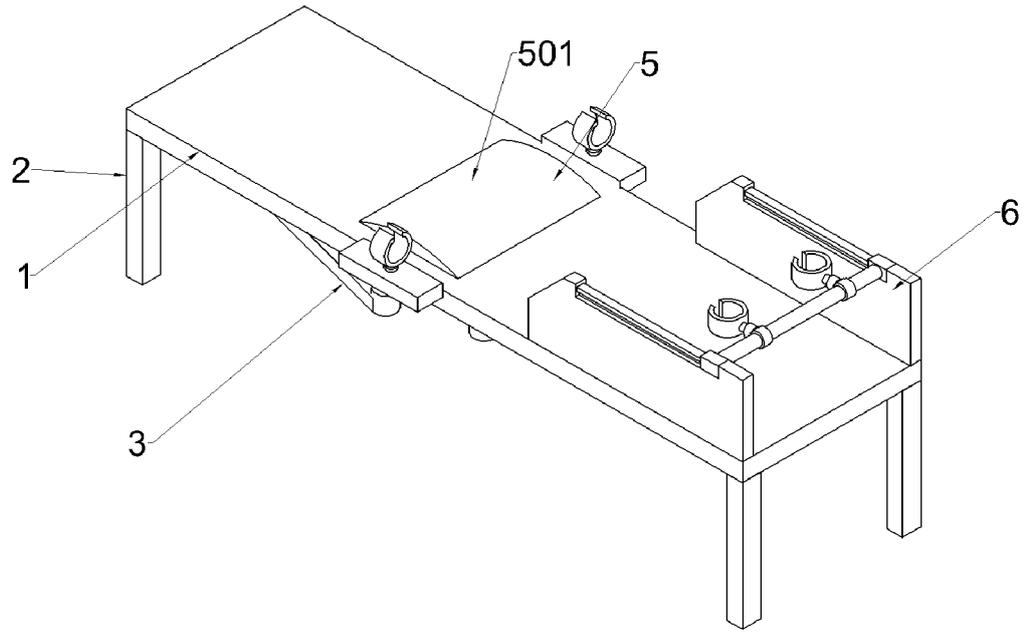


FIG. 1

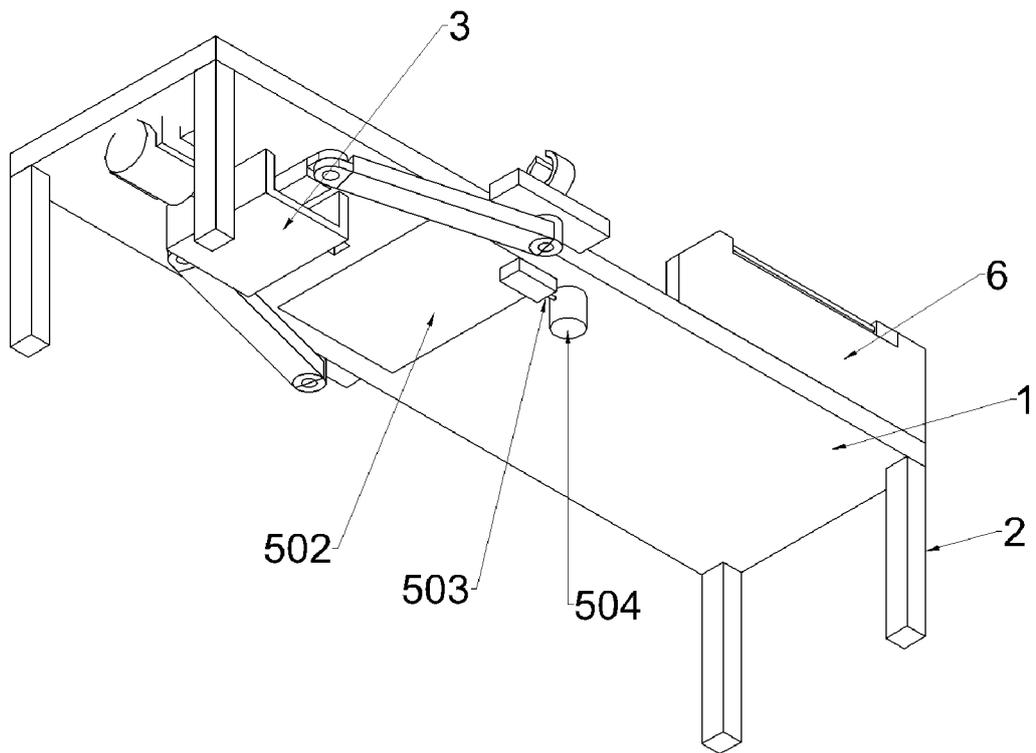


FIG. 2



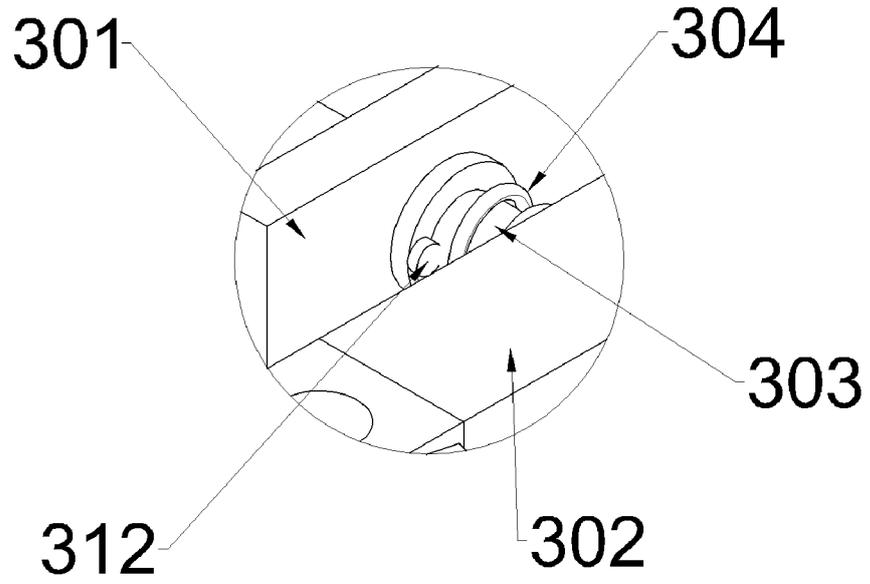


FIG. 5

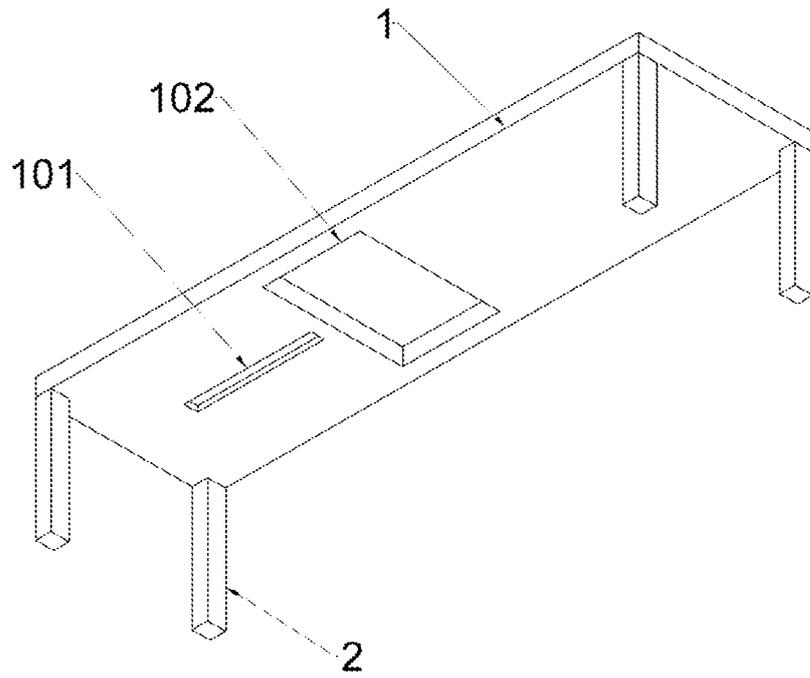


FIG. 6