NEUROSURGICAL DRAINAGE DEVICE WITH ANTI BLOCKING FUNCTION

Field of the Invention

The present invention relates to the field of neurosurgery technology, particularly to a neurosurgical drainage device with anti blocking function.

Background to the Invention

After neurosurgical procedures, especially ventricular puncture drainage, intracranial hematoma removal, and intracranial tumor resection, it is often necessary to place drainage tubes to drain intracranial hemorrhage, cerebrospinal fluid, or inflammatory exudate. This is a key measure to reduce intracranial pressure, prevent infection, and promote recovery.

At present, the commonly used postoperative drainage devices in clinical practice are mainly composed of drainage tubes, drainage bags (or drainage bottles), and fixed brackets. However, in practical use, due to the lack of anti blocking function, the drainage tubes are prone to blockage, and the blockage materials are usually blood clots, broken brain tissue, or protein clots. Once blockage occurs, it not only leads to drainage failure, but also increases intracranial pressure again, endangering the patient's life. It may also force doctors to perform secondary surgical intervention (such as replacing drainage tubes or re puncturing), or try to clear by manual flushing. Manual flushing carries the risk of retrograde infection, sudden changes in intracranial pressure, etc., causing secondary harm to patients, but also increases the workload and occupational exposure risk of medical staff. Therefore, there is a lack of Defects in the anti blocking function, As a result, it cannot meet the usage needs of medical staff.

Therefore, technicians in this field have provided a neurosurgical drainage device with anti blocking function to solve the problems raised in the background technology mentioned above.

Statement of Invention

In order to improve the problem of not having anti blocking function, the present invention provides a neurosurgical drainage device with anti blocking function.

The present invention provides a neurosurgical drainage device with anti blocking function, which adopts the following technical solution:

A neurosurgical drainage device with anti blocking function, comprising a counterweight plate,the top of the counterweight plate is fixedly connected with a vertical plate, the outer surface of the vertical plate is slidably connected with an adjustment frame, the top of the adjustment frame is fixedly connected with a drive box, the top of the inner cavity of the drive box is fixedly installed with a servo motor, the output end of the servo motor is fixedly connected with a screw rod, and the outer surface of the screw rod is threaded with a rectangular plate, the left side of the rectangular plate is fixedly connected to a drive plate, and the left side of the drive box is slidably connected to an L-shaped plate, the left side of the drive plate passes through the drive box and is fixedly connected to the connection of the L-shaped plate, a hook is fixedly connected to the right side of the inner cavity of the L-shaped plate, and a disposable drainage bag is suspended on the outer surface of the hook, a disposable drainage tube is connected to the top of the disposable drainage bag, a limit components are set at the front and rear positions on both sides of the adjustment frame.

By adopting the above technical solution, the setting of the counterweight plate, vertical

plate, adjustment frame, and limit component can flexibly adjust the overall height according to clinical needs, adapt to different hospital beds and operating scenarios. By setting L-shaped plates, hooks, disposable drainage bags, and disposable drainage tubes, it can meet clinical sterile use standards and achieve safe and reliable drainage fluid collection. By setting a drive box, servo motor, screw rod, rectangular plate, and drive plate, the disposable drainage bag can be controlled to perform slow and smooth reciprocating lifting motion, which periodically changes the static pressure gradient of the drainage system, causing slight positive and negative fluid flow disturbances inside the drainage tube, effectively "loosening" blood clots or tissue fragments that may adhere to the tube wall, and preventing blockage formation.

Optionally, the limit component comprises a limit bolt, the outer surface of the limit bolt is threadedly connected to the connection of the adjustment frame, pin holes are opened at the front and rear positions on both sides of the vertical plate, and one end of the limit bolt extends to the inner cavity of the pin hole and is closely adhered to the connection of the pin hole.

By adopting the above technical solution and setting limit bolts and pin holes, it is convenient to limit the connection between the adjustment frame and the vertical plate.

Optionally, a guide plate is fixedly connected to the right side of the rectangular plate, and a guide groove is opened on the right side of the inner cavity of the drive box for use in conjunction with the guide plate, the outer surface of the guide plate is slidably connected to the inner surface of the guide groove.

By adopting the above technical solution and setting the guide plate and guide groove, it is convenient to guide and limit the rectangular plate.

Optionally, the top of the vertical plate on both sides is fixedly connected to a limit plate,

and the inner cavity of the adjustment frame is provided with limit grooves on both sides for use in conjunction with the limit plate, and the outer surface of the limit plate is slidably connected to the inner surface of the limit groove.

By adopting the above technical solution, the setting of limit plates and limit grooves can facilitate the guiding and limiting of the adjustment frame.

Optionally, the bottom four corners of the counterweight plate are all flexibly connected with universal wheels, and one side of the universal wheels is provided with a locking plate.

By adopting the above technical solution, the setting of universal wheels and locking plates can facilitate the mobile support of the device.

Optionally, a support cylinder for use with a disposable drainage tube is fixedly installed on the left side of the top of the L-shaped plate cavity through a bracket, and the disposable drainage tube extends to the outside of the support cylinder.

By adopting the above technical solution and setting the support cylinder, it is convenient to support the disposable drainage tube.

Optionally, the bottom of the screw rod is rotatably connected to the drive box through a bearing, and a handle is fixedly connected to the right side of the drive box.

By adopting the above technical solution and setting the handle, it is convenient to move and guide the device.

Optionally, a sliding rail is fixedly connected to the front and rear positions on the left side of the drive box, and the outer surface of the sliding rail is slidably connected to the inner surface of the L-shaped plate.

By adopting the above technical solution and setting the sliding rail, it is convenient to guide and support the L-shaped plate.

In summary, the present invention has the following beneficial effects:

1. The present invention can flexibly adjust the overall height according to clinical needs and adapt to different hospital beds and operating scenarios by setting counterweight plates, vertical plates, adjustment frames, and limit components; By setting L-shaped plates, hooks, disposable drainage bags, and disposable drainage tubes, it can meet clinical sterile use standards and achieve safe and reliable drainage fluid collection. By setting a drive box, servo motor, screw rod, rectangular plate, and drive plate, the disposable drainage bag can be controlled to perform slow and smooth reciprocating lifting motion, which periodically changes the static pressure gradient of the drainage system, causing slight positive and negative fluid flow disturbances inside the drainage tube, effectively "loosening" blood clots or tissue fragments that may adhere to the tube wall, and preventing blockage formation. By setting the above structure, it can have the advantage of anti blocking function, thus meeting the usage needs of medical staff.

2. The present invention facilitates the positioning of the connection between the adjustment frame and the vertical plate by setting limit bolts and pin holes, the setting of guide plates and guide grooves, the setting of guide limit for rectangular plates, the setting of limit plates and limit grooves, the setting of guide limit for the adjustment frame, the setting of universal wheels and locking plates, the convenience of mobile support for the device, the setting of support tubes, the convenience of supporting disposable drainage pipes, the setting of handles, the convenience of mobile guidance for the device, and the setting of sliding rails, the convenience of guiding and supporting L-shaped plates.

Brief Description of the Drawings

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

FIG. 2 is a sectional view of the adjustment frame structure of the present invention;

FIG. 3 is an enlarged view of the structure A in Figure 2 of the present invention;

FIG. 4 is a perspective view of the vertical plate structure of the present invention.

Annotations on the accompanying drawings:

1. Counterweight plate; 2. Vertical plate; 3. Adjustment frame; 4. Drive box; 5. Servo motor; 6. Screw rod; 7. Rectangular plate; 8. Drive plate; 9. L-shaped plate; 10. Hook; 11. Disposable drainage bag; 12. Disposable drainage tube; 13. Limit component; 131. Limit bolt; 132. Pin hole; 14. Guide plate; 15. Guiding groove; 16. Limit plate; 17. Limit groove; 18. Universal wheel; 19. Support cylinder; 20. Sliding rail.

Detailed Description

Further detailed explanation of the present application will be provided in conjunction with Figures 1-4.

Embodiment 1:

Please refer to Figures 1-4, a neurosurgical drainage device with anti blocking function, comprising a counterweight plate 1, the top of the counterweight plate 1 is fixedly connected with a vertical plate 2, the outer surface of the vertical plate 2 is slidably connected with an adjustment frame 3, the top of the adjustment frame 3 is fixedly connected with a drive box 4, the top of the inner cavity of the drive box 4 is fixedly installed with a servo motor 5, the output end of the servo motor 5 is fixedly connected with a screw rod 6, and the outer surface of the screw rod 6 is threaded with a rectangular plate 7, the left side of the rectangular plate 7 is fixedly connected to a drive plate 8, and the left side of the drive box 4 is slidably connected to an L-shaped plate 9, the left side of the drive plate

8 passes through the drive box 4 and is fixedly connected to the connection of the L-shaped plate 9, a hook 10 is fixedly connected to the right side of the inner cavity of the L-shaped plate 9, and a disposable drainage bag 11 is suspended on the outer surface of the hook 10, a disposable drainage tube 12 is connected to the top of the disposable drainage bag 11, a limit components 13 are set at the front and rear positions on both sides of the adjustment frame 3. A guide plate 14 is fixedly connected to the right side of the rectangular plate 7, and a guide groove 15 is opened on the right side of the inner cavity of the drive box 4 for use in conjunction with the guide plate 14, the outer surface of the guide plate 14 is slidably connected to the inner surface of the guide groove 15. The top of the vertical plate 2 on both sides is fixedly connected to a limit plate 16, and the inner cavity of the adjustment frame 3 is provided with limit grooves 17 on both sides for use in conjunction with the limit plate 16, and the outer surface of the limit plate 16 is slidably connected to the inner surface of the limit groove 17. The bottom four corners of the counterweight plate 1 are all flexibly connected with universal wheels 18, and one side of the universal wheels 18 is provided with a locking plate. A support cylinder 19 for use with a disposable drainage tube 12 is fixedly installed on the left side of the top of the L-shaped plate 9 cavity through a bracket, and the disposable drainage tube 12 extends to the outside of the support cylinder 19. The bottom of the screw rod 6 is rotatably connected to the drive box 4 through a bearing, and a handle is fixedly connected to the right side of the drive box 4. A sliding rail 20 is fixedly connected to the front and rear positions on the left side of the drive box 4, and the outer surface of the sliding rail 20 is slidably connected to the inner surface of the L-shaped plate 9.

In this embodiment: The present invention can flexibly adjust the overall height according to clinical needs and adapt to different hospital beds and operating scenarios by setting counterweight plates, vertical plates, adjustment frames, and limit components; By setting

L-shaped plates, hooks, disposable drainage bags, and disposable drainage tubes, it can meet clinical sterile use standards and achieve safe and reliable drainage fluid collection. By setting a drive box, servo motor, screw rod, rectangular plate, and drive plate, the disposable drainage bag can be controlled to perform slow and smooth reciprocating lifting motion, which periodically changes the static pressure gradient of the drainage system, causing slight positive and negative fluid flow disturbances inside the drainage tube, effectively "loosening" blood clots or tissue fragments that may adhere to the tube wall, and preventing blockage formation. By setting the above structure, it can have the advantage of anti blocking function, thus meeting the usage needs of medical staff.

Embodiment 2:

Referring to Figures 1, 2, and 4, the limit component 13 comprises a limit bolt 131, the outer surface of the limit bolt 131 is threadedly connected to the connection of the adjustment frame 3, pin holes 132 are opened at the front and rear positions on both sides of the vertical plate 2, and one end of the limit bolt 131 extends to the inner cavity of the pin hole 132 and is closely adhered to the connection of the pin hole 132.

In this embodiment, the present invention can conveniently limit the connection between the adjustment frame 3 and the vertical plate 2 by setting limit bolts 131 and pin holes 132.

The implementation principle of the present invention is as follows: when in use, medical staff push the device to a suitable position next to the patient's bed, step on the locking plate of the universal wheel 18, fix the device to prevent movement, and then manually slide the adjustment frame 3 up and down according to the height of the hospital bed. When the hook 10 reaches a suitable height slightly lower than the patient's intracranial drainage outlet plane, tighten the four limit bolts 131 to push it into the pin hole 132 on the vertical plate 2, and firmly lock the adjustment frame 3;

Next, hang the disposable drainage bag 11 on the hook 10 on the right side of the inner cavity of the L-shaped plate 9. Connect one end of the disposable drainage tube 12 to the drainage tube in the patient's body under aseptic operation. Then, pass the other end of the disposable drainage tube 12 through the support cylinder 19 at the top of the inner cavity of the L-shaped plate 9, and tightly connect it to the entrance of the disposable drainage bag 11, so that the support cylinder 19 plays a fixed and supporting role, avoiding the pipeline from bending during lifting and lowering. Finally, check that the device connection is correct, the drainage pipeline is unobstructed, and the position of the disposable drainage bag 11 is appropriate;

Next, the power is turned on, and through an external controller, the medical staff starts servo motor 5 at regular intervals according to the actual usage situation, so that the output end of servo motor 5 drives screw rod 6 to rotate on the inner surface of rectangular plate 7, causing rectangular plate 7 to drive drive plate 8 to move vertically in a reciprocating manner. At the same time, drive plate 8 drives L-shaped plate 9 to move vertically in a reciprocating manner on the outer surface of sliding rail 20, causing L-shaped plate 9 drives the suspended disposable drainage bag 11 to slowly and smoothly move up and down, allowing it to periodically change the static pressure gradient of the drainage system during operation, causing slight positive and negative fluid flow disturbances inside the disposable drainage tube 12, effectively "loosening" blood clots or tissue fragments that may adhere to the tube wall, preventing blockage formation. This device is easy to operate and convenient for anti blockage drainage, thus meeting the needs of medical staff.

The above are the preferred embodiments of the present invention and do not limit the scope of protection of the present invention. Therefore, any equivalent changes made according to the structure, shape, and principle of the present invention should be included in the scope of protection of the present invention.