A SEALING DEVICE FOR TUMOR SPECIMENS

Field of the Invention

The invention relates to the field of oncology, and more particularly to a sealing device for tumor specimens.

Background to the Invention

Tumors are neoplasms formed as a result of the clonal abnormal proliferation of a certain cell in local tissue, which loses normal growth regulation at the genetic level under the influence of various carcinogenic factors. It is generally believed that tumor cells are monoclonal, meaning that all tumor cells in a tumor are descendants of a single mutated cell.

During medical procedures, it is necessary to collect tumor tissue and place it in a sealing device to support and store the specimen.

For example, Chinese Patent Application No. CN201720985986.1 discloses a tumor specimen classification collection box, comprising a fixed sleeve, a condensation tube, a tumor specimen collection box, a thermal insulation layer, and a drawer. The fixed sleeve is fixed on the outer side around the box cover by fixing bolts and is connected to a telescopic rod at the lower part. The condensation tube is installed on the inner surface of the box cover. The outer sidewall of the tumor specimen collection box is provided with a sliding groove, which is connected to the box cover via the fixed sleeve and the telescopic rod. The thermal insulation layer is provided inside the tumor specimen collection box, and a tumor specimen placement groove is installed inside it. A disinfection pad is arranged at the bottom of the tumor specimen placement groove. The drawer is arranged at the bottom of the tumor specimen collection box. The tumor specimen classification collection box is internally provided with tumor specimen placement grooves of different specifications, suitable for storing tumor specimens of various sizes. Meanwhile, the outer surface of the dustproof cover plate above each placement groove is equipped with a slot for holding a label card, facilitating future specimen retrieval.

However, traditional tumor specimen storage and retrieval devices require opening the storage unit each time for access, which causes the internal temperature of the storage unit to rise during opening, thus impairing the constant-temperature preservation of tumor specimens. Therefore, technical personnel in the field have provided a sealing device for tumor specimens to address the problems raised in the background art above.

Statement of Invention

The purpose of the invention is to provide a sealing device for tumor specimens to solve the problems raised in the background art above.

To achieve the above purpose, the invention provides the following technical solution:

A sealing device for tumor specimens, comprising a placement box. A motor is fixedly installed inside the placement box, and the output end of the motor is fixedly connected to a turntable. A plurality of connecting rods are fixedly connected to the outer part of the turntable, and the connecting rods are circumferentially and uniformly distributed around the outer part of the turntable. The end of each connecting rod remote from the turntable is respectively and fixedly connected to a placement base. A placement tube capable of storing tumor specimens is movably placed inside each placement base. One side of the placement box is provided with an opening, and different placement tubes are driven by the motor and arranged coaxially with the opening to perform storage and retrieval operations.

As a further aspect of the invention: the placement box comprises an upper box body, a lower box body, and a movable cover, wherein the upper box body is screwed onto the upper part of the lower box body.

As a still further aspect of the invention: the movable cover fits the opening, and the movable cover movably seals the opening.

As a still further aspect of the invention: a fan is fixedly installed at the upper part of the upper box body, and a semiconductor cooler is fixedly connected to the lower part of the fan.

As a still further aspect of the invention: a movable disk is rotatably installed at the lower part of the semiconductor cooler, the movable disk is in close contact with the turntable, and the semiconductor cooler performs a cooling operation on the placement bases via the movable disk, the turntable, and the connecting rods for guiding.

As a still further aspect of the invention: the placement base comprises a base body, the base body is fixedly connected to the connecting rod, a placement groove is formed inside the base body, the placement tube comprises a tube body, the tube body is movably placed in the placement groove, and a screw cap is screwed onto the upper part of the tube body.

As a still further aspect of the invention: an electric push rod is fixedly installed at the lower part of the side of the placement box close to the opening, a circular hole is formed at the lower part of the base body, and the electric push rod passes through the circular hole and contacts the tube body.

The beneficial effects of the invention compared to the prior art are:

1. The invention provides a structure wherein a motor is fixedly installed inside the placement box, and the output end of the motor is fixedly connected to a turntable. A plurality of connecting rods are fixedly connected to the outer portion of the turntable, with the connecting rods circumferentially and uniformly distributed. Each connecting rod is fixedly connected at the end remote from the turntable to a placement base. The motor can drive the rotation of the placement bases, and placement tubes capable of storing tumor specimens are movably arranged within the placement bases. An opening is provided on one side of the placement box, enabling different placement tubes to be driven by the motor and coaxially aligned with the opening for storage and retrieval operations. This configuration reduces the time during which other placement tubes are exposed to external air, thereby minimizing the impact of ambient temperature on the tumor specimens inside the placement tubes.

2. The invention includes a placement box composed of an upper box body, a lower box body, and a movable cover. The upper box body is screwed onto the upper part of the lower box body. The movable cover matches the opening and can seal the opening via a

movable sealing action.

3. The invention further provides that a fan is fixedly installed at the upper part of the upper box body, and a semiconductor cooler is fixedly connected to the lower part of the fan. A movable disk is rotatably installed at the lower part of the semiconductor cooler and is in close contact with the turntable. This allows the semiconductor cooler to perform cooling operations on the placement bases via the movable disk, the turntable, and the connecting rods, thereby preserving the tumor specimens in a refrigerated state.

4. The invention further comprises that each placement base includes a base body, which is fixedly connected to the connecting rod. A placement groove is formed within the base body, and the placement tube includes a tube body that is movably arranged in the placement groove. A screw cap is threaded onto the upper portion of the tube body. An electric push rod is fixedly installed at the lower part of the side of the placement box close to the opening. A circular hole is formed at the lower part of the base body, through which the electric push rod passes to contact the tube body. This configuration allows the user to control the motor to move the placement base containing the placement tube to the opening position, and then eject the tube via the electric push rod, facilitating easy retrieval.

Brief Description of the Drawings

FIG. 1 is a schematic view of the overall structure of the invention.

FIG. 2 is a schematic view of the internal structure of the placement box of the invention.

FIG. 3 is a sectional structural schematic view of the placement base of the invention.

In the drawings: 1: placement box; 101: lower box body; 102: upper box body; 103: movable cover; 2: motor; 3: turntable; 4: connecting rod; 5: placement base; 501: base body; 502: placement groove; 503: circular hole; 6: placement tube; 601: tube body; 602: screw cap; 7: electric push rod; 8: semiconductor cooler; 9: movable disk; 10: fan.

Detailed Description

The following provides a clear and complete description of the technical solutions in the embodiments of the invention with reference to the accompanying drawings of the invention embodiments. It is evident that the described embodiments represent only a portion of the invention's embodiments, rather than all possible embodiments. Based on the embodiments of the invention, all other embodiments obtained by those of ordinary skill in the art without creative effort shall fall within the scope of protection of the invention.

Referring to FIGs. 1 to 3, in the embodiment of the invention, a sealing device for tumor specimens is provided, comprising a placement box 1. A motor 2 is fixedly installed inside the placement box 1, and the output end of the motor 2 is fixedly connected to a turntable 3. A plurality of connecting rods 4 are fixedly connected to the outer portion of the turntable 3, and the connecting rods 4 are circumferentially and uniformly distributed around the outer portion of the turntable 3. The end of each connecting rod 4 remote from the turntable 3 is respectively and fixedly connected to a placement base 5. A placement tube 6 capable of storing tumor specimens is movably placed inside each placement base 5. One side of the placement box 1 is provided with an opening, and different placement tubes 6 are driven by the motor 2 and arranged coaxially with the opening to perform storage and retrieval operations.

By means of the motor 2 being fixedly installed inside the placement box 1 and having its output end fixedly connected to the turntable 3, and by fixedly connecting a plurality of connecting rods 4 to the outer portion of the turntable 3 in a circumferentially uniform manner, with each connecting rod 4 being fixed at the end distant from the turntable 3 to a placement base 5, the motor 2 can drive the placement bases 5 to rotate. Placement tubes 6 capable of storing tumor specimens are movably arranged inside the placement bases 5. One side of the placement box 1 is provided with an opening, and different placement tubes 6 are driven by the motor 2 and arranged coaxially with the opening for storage and retrieval operations. This configuration reduces the exposure time of other placement tubes 6 to external air, thereby minimizing the effect of ambient temperature on the tumor specimens inside the placement tubes 6.

In this embodiment, the placement box comprises an upper box body 102, a lower box body 101, and a movable cover 103. The upper box body 102 is screwed onto the upper part of the lower box body 101. The movable cover 103 fits the opening and movably seals the opening.

By configuring the placement box to comprise the upper box body 102, the lower box body 101, and the movable cover 103, with the upper box body 102 being screwed onto the upper part of the lower box body 101, and the movable cover 103 fitting and sealing the opening, sealing operations can be achieved.

In this embodiment, a fan 10 is fixedly installed at the upper part of the upper box body 102, and a semiconductor cooler 8 is fixedly connected to the lower part of the fan 10. A movable disk 9 is rotatably installed at the lower part of the semiconductor cooler 8, and the movable disk 9 is in close contact with the turntable 3. The semiconductor cooler 8 performs cooling operations on the placement bases 5 via the movable disk 9, the turntable 3, and the connecting rods 4 for guiding.

By means of the fan 10 fixedly installed at the upper part of the upper box body 102, and the semiconductor cooler 8 fixedly connected to the lower part of the fan 10, and the movable disk 9 rotatably installed at the lower part of the semiconductor cooler 8 in close contact with the turntable 3, the semiconductor cooler 8 can guide the cooling operation to the placement bases 5 via the movable disk 9, the turntable 3, and the connecting rods 4, thereby preserving the tumor specimens under refrigerated conditions.

In this embodiment, the placement base 5 comprises a base body 501. The base body 501 is fixedly connected to the connecting rod 4, and a placement groove 502 is formed inside the base body 501. The placement tube 6 comprises a tube body 601, which is movably placed inside the placement groove 502. A screw cap 602 is threaded onto the upper part of the tube body 601. An electric push rod 7 is fixedly installed at the lower part of the side of the placement box 1 near the opening. A circular hole 503 is formed at the lower part of the base body 501. The electric push rod 7 passes through the circular hole 503 and contacts the tube body 601.

By means of the placement base 5 comprising the base body 501, which is fixedly

connected to the connecting rod 4, and the base body 501 being internally provided with the placement groove 502, the placement tube 6 comprises the tube body 601, which is movably placed inside the placement groove 502, and the upper part of the tube body 601 is threaded with the screw cap 602. The electric push rod 7 is fixedly installed at the lower part of the side of the placement box 1 near the opening, and the circular hole 503 is formed at the lower part of the base body 501. The electric push rod 7 passes through the circular hole 503 and contacts the tube body 601, allowing the user to control the motor 2 to move the tumor specimen loaded in the placement tube 6 to the opening position, and the electric push rod 7 pushes the tube out for convenient retrieval.

The working principle of the invention is as follows: a motor 2 is fixedly installed inside the placement box 1, and the output end of the motor 2 is fixedly connected to a turntable 3. A plurality of connecting rods 4 are fixedly connected to the outer portion of the turntable 3, and the connecting rods 4 are circumferentially and uniformly distributed around the outer portion of the turntable 3. The end of each connecting rod 4 remote from the turntable 3 is respectively and fixedly connected to a placement base 5. The motor 2 can thereby drive the placement bases 5 to rotate. A placement tube 6 capable of storing tumor specimens is movably placed inside each placement base 5. One side of the placement box 1 is provided with an opening, allowing different placement tubes 6 to be driven by the motor 2 and aligned coaxially with the opening to perform storage and retrieval operations. This structure reduces the time during which other placement tubes 6 are exposed to external air, thereby minimizing the impact of ambient temperature on the tumor specimens inside the placement tubes 6.

The above description is merely a preferred specific embodiment of the invention and is not intended to limit the scope of protection of the invention. Any equivalent substitutions or modifications made by those skilled in the art within the technical scope disclosed by the invention, in accordance with the technical solutions and inventive concepts of the invention, shall fall within the protection scope of the invention.