CLAIMS

1. A suture system, wherein the suture system comprises: a needle ejection device and a suture control device; the needle ejection device is configured to push out or retract a suture needle, and the suture control device is configured to push out or retract a suture;

the needle ejection device comprises a needle ejection handle, a guide member, a pushing body and the suture needle;

the needle ejection handle comprises a needle ejection top cover and a needle ejection bottom cover which are slidably connected;

the guide member is located in the needle ejection handle, and the guide member is fixedly connected to the needle ejection top cover;

the pushing body and the guide member are movably connected;

at least two suture needles are configured, each suture needle is fixed to a pushing body, and the pushing bodies and the suture needles are arranged in a one-to-one correspondence; and

the needle ejection top cover is configured to slide relative to the needle ejection bottom cover to drive the guide member to move; and the pushing body is configured to move along the guide member to drive the connected suture needle to move.

2. The suture system according to claim 1, wherein the needle ejection device further comprises a locking member and at least two locking strips, wherein the locking strips are fixed to the pushing body; the locking member has a first state and a second state, and when the locking member is in the first state, the locking member is configured to lock at least two locking strips at the same time, and when the locking member is in the second state, the locking member is configured to release the locking of at least two locking strips.

3. The suture system according to claim 2, wherein the locking member comprises a locking post and a locking plate; a locking hole is provided on the needle

ejection top cover, the locking plate is located in the needle ejection handle, a portion of the locking post passes through the locking hole and is threadedly connected to the locking plate, and the remaining portion of the locking post is placed outside the needle ejection handle; when the locking member is in a first state, the locking plate abuts both of at least two locking strips, and when the locking member is in a second state, the locking plate and at least two locking strips are separated, and the locking post is configured to change a position of the locking plate relative to at least two locking strips by rotation.

4. The suture system according to claim 2 or 3, wherein the guide member comprises a first baffle, a second baffle, a third baffle and a conical block, and the conical block is fixed to a side of the first baffle away from the second baffle;

the pushing body comprises first pushing bodies and second pushing bodies, wherein two first pushing bodies and two second pushing bodies are configured, the suture needles are fixed to a same side of the first pushing body and the second pushing body close to the conical block, and an end of the suture needle away from the third baffle penetrates the conical block, and the conical block is configured to guide the suture needles into a main tube, and the locking strips are fixed on both of the first pushing body and the second pushing body;

first push shafts are fixed between the first baffle and the second baffle, the first push body is movably sleeved on the first push shaft, and at least one of the first push shafts is sleeved on each of the first push bodies;

second push shafts are fixed between the second baffle and the third baffle, the second push body is movably sleeved on the second push shaft, and at least one of the second push shafts is sleeved on each of the second push bodies; and

a plurality of adjustment holes are provided on the needle ejection top cover, and the first push body and the second push body are both fixed with push rods on sides facing the needle ejection top cover, and each of the push rods partially passes through one of the adjustment holes and is placed outside the needle ejection handle.

5. The suture system according to any one of claims 1 to 4, wherein pressing structures are symmetrically arranged on both side walls of the needle ejection top cover, the pressing structure comprises a pressing plate, an elastic sleeve and a clamping member, and sub-tooth portions and connecting rods are respectively arranged on both sides of the pressing plate, the sub-tooth portions are located on a side away from the needle ejection top cover, and the connecting rods are located on a side close to the needle ejection top cover, and multiple connecting rods are configured;

an end of each connecting rod away from the pressing plate passes through the side wall of the needle ejection top cover and is placed in the needle ejection top cover;

the elastic sleeve is arranged on each connecting rod between the pressing plate and the needle ejection top cover, the clamping member is fixed to the end of each connecting rod away from the pressing plate, and the elastic sleeve, the clamping member and the connecting rod are all arranged in a one-to-one correspondence; and

mother tooth portions are symmetrically arranged on the both side walls of the needle ejection bottom cover, the sub-tooth portions are configured to mesh with the mother tooth portions, and the number of teeth of the sub-tooth portions is less than the number of teeth of the mother tooth portions.

6. The suture system according to any one of claims 1 to 5, wherein the suture control device comprises a suture and a suture pushing assembly; an end of the suture is configured to penetrate into the suture needle, and the suture located in the suture needle is provided with an abutment head; the suture pushing assembly comprises a suture pushing wire, one end of the suture pushing wire abuts against the abutment head, another end of the suture pushing wire is located outside the needle ejection handle, and the suture pushing wire is configured to push the suture.

7. The suture system according to claim 6, wherein the suture pushing assembly further comprises a first tube body, a second tube body and a limit joint, the first tube body is fixedly sleeved on the suture pushing wire, the second tube body is movably sleeved on the suture pushing wire, one end of the suture pushing wire is a thread

pushing end, and another end of the suture pushing wire is a free end, the first tube body is located on a side near the thread pushing end, the second tube body is located on a side near the free end, and the limit joint is fixedly connected to the free end.

8. The suture control device according to claim 7, wherein the suture control device further comprises a suture handle, an adapter joint and a guide tube, an adapter groove is provided outside the suture handle, the adapter joint has a first docking hole and a second docking hole communicated in an axial direction, the suture needle is arranged at one end of the adapter joint and the guide tube is arranged at the other end of the adapter joint, part of the suture needle is fixedly sleeved in the first docking hole, and part of the guide tube is fixedly sleeved in the second docking hole;

part of the first tube body close to the thread pushing end is capable of being movably placed in the guide tube, the second tube body and the limit joint are located outside the suture handle, and the second tube body is capable of being detachably fixed in the adapter groove; and

the suture, the suture pushing assembly, the adapter joint, the guide tube and the suture needle are arranged in a one-to-one correspondence; when the suture needs to be pushed out of the suture needle, the second tube body penetrates into the suture handle and abuts against the first tube body, and the thread pushing end abuts against the abutment head.

9. The suture system according to claim 8, wherein the suture handle comprises a suture top cover and a suture bottom cover; the suture control device further comprises a reel seat, a thread drum and a thread return shaft, which are located in the suture handle;

the reel seat is located at an end of the guide tube away from the adapter joint, the reel seat is provided with a plurality of reel holes on a side facing the suture top cover, and a plurality of thread pushing grooves are provided on the reel seat, the thread pushing grooves and the reel holes are arranged in a one-to-one correspondence, one end of the thread pushing groove is tangent to and communicated with the reel hole,

and another end of the thread pushing groove extends to an end surface of the reel seat close to the adapter joint;

the thread drum is rotatably fixed in the reel hole, and the thread drum is wound with multiple turns of suture, and an end of the suture passes through the thread pushing groove and the guide tube into the suture needle;

the thread return shaft is fixedly connected to the thread drum, and the thread return shaft is configured to rotate the thread drum to perform thread return operation;

the suture top cover is made of transparent material, and the thread drum is provided with a marking position on a side facing the suture top cover, and the thread drum, the thread return shaft, the reel hole, the suture, the suture pushing assembly, the adapter joint, the guide tube and the suture needle are all arranged in a one-to-one correspondence; and

multiple guide tubes are configured, and the multiple guide tubes are spaced apart.

10. The suture system according to any one of claims 1 to 9, wherein the suture system further comprises a suture grasping device, and the suture grasping device comprises:

a capture net having a contracted state and an expanded state, the capture net being strip-shaped in the contracted state and post-shaped in the expanded state;

a connecting tube having a proximal end and a distal end, the distal end being connected to one end of the capture net;

a reinforcing member, the reinforcing member being connected to another end of the capture net;

a support tube communicating with the connecting tube, one end of the support tube being connected to the distal end, another end of the support tube being a free end, and the support tube being located in the capture net, the free end of the support tube being configured to abut against or be sleeved with the reinforcing member, wherein the capture net is in the expanded state; and

a state switching wire, one end of the state switching wire passing through the connecting tube and the support tube into the capture net and being connected to the

reinforcing member, another end of the state switching wire being located outside the connecting tube, the state switching wire being configured to move along an axial direction of the connecting tube to switch a state of the capture net.

11. The suture system according to any one of claims 1 to 10, wherein the suture system further comprises a bending adjustment device, and the bending adjustment device comprises a main tube and a first bending adjustment structure;

the main tube has a front end and a rear end, a first chamber is provided in the main tube, and a first wire entry hole is provided on a side wall of the main tube between the front end and the rear end, and the first wire entry hole is communicated to the first chamber;

the first bending adjustment structure comprises a first rotating disk, a first rotating shaft and a first bending adjustment wire; one end of the first bending adjustment wire is fixed to the front end of the main tube, and another end of the first bending adjustment wire passes through the first chamber and the first wire entry hole and is fixed to the first rotating disk; and

the first rotating disk and the first rotating shaft are fixedly connected, and the first rotating disk is configured to rotate synchronously with the first rotating shaft to tighten or loosen the first bending adjustment wire.

12. The suture system according to claim 11, wherein the bending adjustment device further comprises a fixed block and a first positioning bead;

the first rotating shaft and the fixed block are rotatably connected, two first rotating disks are configured, and the two first rotating disks are located at both ends of the fixed block;

a plurality of first projections are arranged on one end surface of the first rotating disk facing the fixed block, and the plurality of first projections are arranged in an array around an axis of the first rotating disk, and a first clamping space is formed between adjacent first projections; a plurality of first positioning beads are fixed on a side of the fixed block facing the first rotating disk, and beads of the first positioning beads are

clamped in the first clamping space, and the beads of the first positioning beads are able to be clamped in different first clamping spaces when the first rotating shaft rotates; and the first rotating disk, the first bending adjustment wire and the first wire feeding hole are all arranged in a one-to-one correspondence; and

ends of the two first bending adjustment wires away from the front end of the main tube are distributed on both sides of the axis of the main tube, so that when the first rotating shaft rotates, any one of the two first bending adjustment wires is in a tightened state, and another of the two first bending adjustment wires is in a relaxed state.

13. The suture system according to any one of claims 11 or 12, wherein the bending adjustment device further comprises a front-end seat, the front-end seat is connected to the front end of the main tube;

the front-end seat is provided with a wire threading hole, the first bending adjustment wire passes through the wire threading hole to become a double-strand bending adjustment wire, one end of the double-strand bending adjustment wire is fixed to the wire threading hole, and another end of the double-strand bending adjustment wire passes through the first chamber and is fixed to the first rotating disk; or, the bending adjustment device further comprises an adapter post, one end of the adapter post is fixed to one end of the front-end seat close to the main tube, the adapter post is fixedly connected to the first bending adjustment wire, and the adapter post is sleeved and fixed in the first chamber.

14. The suture system according to claim 13, wherein the main tube is further provided with a second chamber and a plurality of third chambers, the second chamber is configured to allow the inner tube to pass through, and the third chambers are configured to allow the suture needles to pass through; the bending adjustment device further comprises a plurality of guide posts, one end of the guide post is fixed to an end of the front-end seat close to the main tube, and another end of the guide post is placed in the third chamber, and the guide post is configured to allow the suture needle to pass out of the main tube; at least two groups of developing parts are provided on the

plurality of guide posts, and the developing parts are configured to distinguish the guide posts at different positions; and

wherein a plurality of the third chambers are arranged in an array around the axis of the main tube, four third chambers are configured, the third chambers, the guide posts and the suture needles are arranged in a one-to-one correspondence; developing parts are respectively arranged on the outer side walls of any two adjacent guide posts among the four guide posts, any one of the two guide posts with the developing parts has one developing part thereon, and another one of the two guide posts with the developing parts has two developing parts thereon, a developing distance is formed between the two developing parts on the same guide post, and the developing distance is greater than an axial length of the developing part; and at least one first bending adjustment wire is arranged between the two guide posts with the developing parts.

15. The suture system according to any one of claims 1 to 14, wherein the suture system further comprises an exhaust device configured to exhaust tube bodies in the suture system, wherein the tube bodies in the suture system comprise a main tube, an inner tube and a plurality of the suture needles, the main tube comprises a second chamber and a plurality of third chambers, the plurality of the third chambers are spaced around an axis of the second chamber, the inner tube is able to be movably sleeved in the second chamber, and the suture needle is able to be movably sleeved in the third chamber; and the exhaust device comprises: a first exhaust structure and a second exhaust structure;

the first exhaust structure comprises an exhaust pipe, a first knob, a screw cap and a first sealing ring, one end of the exhaust pipe is detachably sleeved with the first knob, and another end of the exhaust pipe is detachably sleeved with the screw cap, the first sealing ring is located in the exhaust pipe and contacts the first knob, and a liquid injection port is provided on the screw cap or the exhaust pipe on a side of the first sealing ring away from the first knob; the first knob is configured to allow the main tube to penetrate or pass through the exhaust pipe, and the first knob is further configured to squeeze the first sealing ring so that the first sealing ring and an outer

periphery of the main tube are tightly matched, or the first knob is further configured to be away from the first sealing ring so that the first sealing ring and the outer periphery of the main tube are spaced apart;

the second exhaust structure comprises a first tubular object, a second sealing ring and a second knob, one end of the first tubular is sleeved with one end of the main tube away from the first exhaust structure, and another end of the first tubular object is sleeved with the second knob, the second sealing ring is located in the first tubular object and contacts the second knob; the second knob is configured to allow the inner tube to pass through and be placed in the main tube, and the second knob is further configured to squeeze the second sealing ring so that the second sealing ring and the outer periphery of the inner tube are tightly matched, or the second knob is further configured to be away from the second sealing ring so that the second sealing ring and the outer periphery of the main tube are spaced apart; and

when exhaust is required, the screw cap is connected to the exhaust pipe, and liquid is injected into the exhaust pipe through the liquid injection port, the first sealing ring and the main tube are tightly matched, and the second sealing ring and the inner tube are spaced apart.