What is claimed is:

1. A spreader tilting control apparatus, comprising:

a spreader;

at least one lifting mechanism, wherein each lifting mechanism has a lifting end connected to the spreader, and each lifting mechanism is configured to adjust a tilt angle of the spreader by adjusting a height of the lifting end;

a stroke measurement module, configured to directly or indirectly measure a height change value of the lifting end of each lifting mechanism in real time;

a processing module, configured to receive the height change value, measured by the stroke measurement module, of the lifting end of each lifting mechanism, and determine an actual tilt angle of the spreader based on the height change value; and

a control module, configured to:

control, based on an adjustment instruction, each lifting mechanism to adjust the height of the lifting end, so as to adjust the tilt angle of the spreader;

determine whether the actual tilt angle is the same as a tilt angle that is corresponding to the adjustment instruction; and

in response to the actual tilt angle being different from the tilt angle that is corresponding to the adjustment instruction, control each lifting mechanism to adjust the height of the lifting end until the actual tilt angle is the same as the tilt angle that is corresponding to the adjustment instruction;

the spreader tilting control apparatus comprising a first lifting mechanism, a second lifting mechanism, a third lifting mechanism and a fourth lifting mechanism, wherein

the first lifting mechanism comprises a first push-pull device and a first flexible pull member and a first direction changing mechanism, the first flexible pull member is connected to one end of a pull rod of the first push-pull device, the first push-pull device is configured to pull the first flexible pull member to adjust a height of a lifting end of the first lifting mechanism, the first direction changing mechanism is located between the first push-pull device and the spreader, the first flexible pull member is wound on the first direction changing mechanism, and the first direction changing mechanism is configured to change a force application direction of the first flexible pull member;

the second lifting mechanism comprises the first push-pull device, a second flexible pull member and a second direction changing mechanism, the second flexible pull member is connected to the other end of the first push-pull device, the first push-pull device is further configured to pull the second flexible pull member to adjust a height of a lifting end of the second lifting mechanism, the second

direction changing mechanism is located between the first push-pull device and the spreader, the second flexible pull member is wound on the second direction changing mechanism, and the second direction changing mechanism is configured to change a force application direction of the second flexible pull member;

the third lifting mechanism comprises a second push-pull device, a third flexible pull member and a third direction changing mechanism, the second push-pull device is configured to pull the third flexible pull member to adjust a height of a lifting end of the third lifting mechanism, the third direction changing mechanism is located between the second push-pull device and the spreader, the third flexible pull member is wound on the third direction changing mechanism, and the third direction changing mechanism is configured to change a force application direction of the third flexible pull member;

the fourth lifting mechanism comprises a third push-pull device, a fourth flexible pull member and a fourth direction changing mechanism, the third push-pull device is configured to pull the fourth flexible pull member to adjust a height of a lifting end of the fourth lifting mechanism, the fourth direction changing mechanism is located between the third push-pull device and the spreader, the fourth flexible pull member is wound on the fourth direction changing mechanism, and the fourth direction changing mechanism is configured to change a force application direction of the fourth flexible pull member;

the lifting end of the first lifting mechanism, the lifting end of the second lifting mechanism, the lifting end of the third lifting mechanism, and the lifting end of the fourth lifting mechanism are arranged to define a quadrilateral, and the lifting end of the first lifting mechanism and the lifting end of the second lifting mechanism are respectively located at two opposite vertices of the quadrilateral;

a portion, located between the first direction changing mechanism and the first push-pull device, of the first flexible pull member is collinear with a portion, located between the second direction changing mechanism and the first push-pull device, of the second flexible pull member.

2. The spreader tilting control apparatus according to claim 1, wherein the first lifting mechanism further comprises a first auxiliary direction changing mechanism, the first auxiliary direction changing mechanism is located between the first direction changing mechanism and the first push-pull device, the first flexible pull member is wound on the first auxiliary direction changing mechanism, and the first auxiliary direction changing mechanism is configured to change the force application direction of the first flexible pull member;

the second lifting mechanism further comprises a second auxiliary direction changing mechanism, the second auxiliary direction changing mechanism is located between the second direction changing mechanism and the first push-pull device, the second flexible pull member is wound on the second

auxiliary direction changing mechanism, and the second auxiliary direction changing mechanism is configured to change the force application direction of the second flexible pull member;

the third lifting mechanism further comprises a third auxiliary direction changing mechanism, the third auxiliary direction changing mechanism is located between the third direction changing mechanism and the second push-pull device, the third flexible pull member is wound on the third auxiliary direction changing mechanism, and the third auxiliary direction changing mechanism is configured to change the force application direction of the third flexible pull member; and

the fourth lifting mechanism further comprises a fourth auxiliary direction changing mechanism, the fourth auxiliary direction changing mechanism is located between the fourth direction changing mechanism and the third push-pull device, the fourth flexible pull member is wound on the fourth auxiliary direction changing mechanism, and the fourth auxiliary direction changing mechanism is configured to change the force application direction of the fourth flexible pull member.

3. The spreader tilting control apparatus according to claim 2, wherein a portion, located between the first auxiliary direction changing mechanism and the first push-pull device, of the first flexible pull member is collinear with a portion, located between the second auxiliary direction changing mechanism and the first push-pull device, of the second flexible pull member.

4. The spreader tilting control apparatus according to any one of claims 1 to 3, wherein one end of the first flexible pull member is connected to the first push-pull device, the other end is connected to the spreader, and the lifting end of the first lifting mechanism is the end, connected to the spreader, of the first flexible pull member;

one end of the second flexible pull member is connected to the first push-pull device, the other end is connected to the spreader, and the lifting end of the second lifting mechanism is the end, connected to the spreader, of the second flexible pull member;

one end of the third flexible pull member is connected to the second push-pull device, the other end is connected to the spreader, and the lifting end of the third lifting mechanism is the end, connected to the spreader, of the third flexible pull member; and

one end of the fourth flexible pull member is connected to the third push-pull device, the other end is connected to the spreader, and the lifting end of the fourth lifting mechanism is the end, connected to the spreader, of the fourth flexible pull member.

5. The spreader tilting control apparatus according to any one of claims 1 to 3, wherein the spreader tilting control apparatus further comprises a pull member fixing mechanism, wherein

the first lifting mechanism further comprises a first hoisting pulley, the first hoisting pulley is fixed to the spreader, one end of the first flexible pull member is connected to the pull member fixing

mechanism, the other end goes around the first hoisting pulley and is connected to the first push-pull device, and the lifting end of the first lifting mechanism is a portion, connected to the spreader, of the first hoisting pulley;

the second lifting mechanism further comprises a second hoisting pulley, the second hoisting pulley is fixed to the spreader, one end of the second flexible pull member is connected to the pull member fixing mechanism, the other end goes around the second hoisting pulley and is connected to the first push-pull device, and the lifting end of the second lifting mechanism is a portion, connected to the spreader, of the second hoisting pulley;

the third lifting mechanism further comprises a third hoisting pulley, the third hoisting pulley is fixed to the spreader, one end of the third flexible pull member is connected to the pull member fixing mechanism, the other end goes around the third hoisting pulley and is connected to the second push-pull device, and the lifting end of the third lifting mechanism is a portion, connected to the spreader, of the third hoisting pulley; and

the fourth lifting mechanism further comprises a fourth hoisting pulley, the fourth hoisting pulley is fixed to the spreader, one end of the fourth flexible pull member is connected to the pull member fixing mechanism, the other end goes around the fourth hoisting pulley and is connected to the third push-pull device, and the lifting end of the fourth lifting mechanism is a portion, connected to the spreader, of the fourth hoisting pulley.

6. The spreader tilting control apparatus according to any one of claims 1 to 5, wherein the spreader tilting control apparatus further comprises a first flexible safety pull member and a second flexible safety pull member, one end of the first flexible safety pull member is connected to the first flexible pull member, the other end of the first flexible safety pull member is connected to the second flexible pull member, one end of the second flexible safety pull member is connected to the third flexible pull member, and the other end of the second flexible safety pull member is connected to the fourth flexible pull member.

7. The spreader tilting control apparatus according to any one of claims 1 to 6, wherein the stroke measurement module comprises:

a first set of laser ranging system, comprising a first laser range finder and a first marker, wherein the first laser range finder is fixed to the first push-pull device, the first marker is fixed to one of a push-pull end of the first push-pull device, the first flexible pull member, and the second flexible pull member, and a ranging laser of the first laser range finder is irradiated on the first marker to measure a position change value of the first marker, so as to measure a height change value of the lifting end of each of the first lifting mechanism and the second lifting mechanism;

a second set of laser ranging system, comprising a second laser range finder and a second marker, wherein the second laser range finder is fixed to the second push-pull device, the second marker is fixed to a push-pull end of the second push-pull device or fixed to the third flexible pull member, and a ranging laser of the second laser range finder is irradiated on the second marker to measure a position change value of the second marker, so as to measure a height change value of the lifting end of the third lifting mechanism; and

a third set of laser ranging system, comprising a third laser range finder and a third marker, wherein the third laser range finder is fixed to the third push-pull device, the third marker is fixed to a push-pull end of the third push-pull device or fixed to the fourth flexible pull member, and a ranging laser of the third laser range finder is irradiated on the third marker to measure a position change value of the third marker, so as to measure a height change value of the lifting end of the fourth lifting mechanism.

8. The spreader tilting control apparatus according to claim 7, wherein the first push-pull device comprises a double-headed push-pull rod, the double-headed push-pull rod is connected to the first flexible pull member and the second flexible pull member respectively through a pair of fixed sliders respectively located at two opposite ends of the double-headed push-pull rod, the pair of fixed sliders are respectively slidably mounted on a pair of sliding seats, and the first marker is fixed to one of the pair of the fixed sliders; and

the second push-pull device is connected to the third flexible pull member through a fixed slider located at an end of a push-pull rod of the second push-pull device, and the third push-pull device is connected to the fourth flexible pull member through a fixed slider located at an end of a push-pull rod of the third push-pull device; each one of the fixed slider located at the end of the push-pull rod of the second push-pull device and the fixed slider located at the end of the push-pull rod of the third push-pull device is slidably mounted on a corresponding sliding seat; the second marker is fixed to the fixed slider located at the end of the push-pull rod of the second push-pull device, and the third marker is fixed to the fixed slider located at the end of the push-pull rod of the third push-pull device.

9. A crane, wherein the crane comprises the spreader tilting control apparatus according to any one of claims 1 to 8.