CLAIMS

What is claimed is:

1. An automatic tensioning control system for a hoisting wire rope, comprising:

a hoisting motor control system, wherein the hoisting motor control system is configured to control forward and reverse rotation of a motor (1) to realize lowering and winding of the wire rope; and

an adjustment device, wherein the adjustment device is configured to send out an adjustment signal when a current wire rope tension is less than a preset tension; and the hoisting motor control system is configured to control the motor (1) to rotationally reverse after receiving the adjustment signal~~.~~; and wherein

the hoisting motor control system comprises:

the motor (1), wherein the motor (1) is provided with an oil port A and an oil port B;

a first hydraulic pump (4), wherein the first hydraulic pump (4) is provided with an oil port P1 and an oil port T1; and

a first control valve (2), wherein the first control valve (2) is provided with an oil port a, an oil port A', an oil port B', an oil port P and an oil port T;

wherein the oil port A' is connected to the oil port A, the oil port B' is connected to the oil port B, the oil port P is connected to the oil port P1, and the oil port T and the oil port T1 are both connected to an oil tank;

after a pressure oil acts on the oil port a, the oil port A' is in communication with the oil port P, the oil port B' is in communication with the oil port T, and the first hydraulic pump (4) pumps an oil to the oil port A to drive the motor (1) to rotationally reverse; when no pressure oil acts on the oil port a, the oil port P, the oil port B', the oil port A' and the oil port T are not in communication with each other;

the adjustment device comprises:

a second hydraulic pump (9), wherein the second hydraulic pump (9) is provided with an

oil port P2 and an oil port T2;

a second control valve (8), wherein the second control valve (8) is provided with a signal input end Y1, an oil port A" and an oil port P3;

a tension detector (11); and

a controller (10), wherein the controller (10) is provided with a signal input end I1, a signal output end O1 and a tension determining module;

wherein the oil port A" is connected to the oil port a, the oil port P3 is connected to the oil port P2, and the oil port T2 is connected to the oil tank; a signal output end of the tension detector (11) is connected to the signal input end I1 to transmit a current wire rope tension signal to the controller (10), and the signal output end O1 is connected to the signal input end Y1;

wherein the tension determining module is configured to send out a current signal after determining that the current wire rope tension is less than the preset tension; after the current signal is input into the signal input end Y1, the oil port A" is in communication with the oil port P3, and the second control valve (8) outputs the pressure oil to act on the oil port a; when no signal is input into the signal input end Y1, the oil port A" is not in communication with the oil port P3, and the second control valve (8) does not output the pressure oil.

~~2. The automatic tensioning control system for the hoisting wire rope according to claim 1, wherein~~

~~the hoisting motor control system comprises:~~

~~the motor (1), wherein the motor (1) is provided with an oil port A and an oil port B;~~

~~a first hydraulic pump (4), wherein the first hydraulic pump (4) is provided with an oil port P1 and an oil port T1; and~~

~~a first control valve (2), wherein the first control valve (2) is provided with an oil port a, an oil port A', an oil port B', an oil port P and an oil port T;~~

~~wherein the oil port A' is connected to the oil port A, the oil port B' is connected to the oil port B, the oil port P is connected to the oil port P1, and the oil port T and the oil port T1 are both connected to an oil tank;~~

~~after a pressure oil acts on the oil port a, the oil port A' is in communication with the oil port P, the oil port B' is in communication with the oil port T, and the first hydraulic pump (4) pumps an oil to the oil port A to drive the motor (1) to rotationally reverse; when no pressure~~

~~oil acts on the oil port a, the oil port P, the oil port B', the oil port A' and the oil port T are not in communication with each other;~~

~~the adjustment device comprises:~~

~~a second hydraulic pump (9), wherein the second hydraulic pump (9) is provided with an oil port P2 and an oil port T2;~~

~~a second control valve (8), wherein the second control valve (8) is provided with a signal input end Y1, an oil port A" and an oil port P3;~~

~~a tension detector (11); and~~

~~a controller (10), wherein the controller (10) is provided with a signal input end I1, a signal output end O1 and a tension determining module;~~

~~wherein the oil port A" is connected to the oil port a, the oil port P3 is connected to the oil port P2, and the oil port T2 is connected to the oil tank; a signal output end of the tension detector (11) is connected to the signal input end I1 to transmit a current wire rope tension signal to the controller (10), and the signal output end O1 is connected to the signal input end Y1;~~

~~wherein the tension determining module is configured to send out a current signal after determining that the current wire rope tension is less than the preset tension; after the current signal is input into the signal input end Y1, the oil port A" is in communication with the oil port P3, and the second control valve (8) outputs the pressure oil to act on the oil port a; when no signal is input into the signal input end Y1, the oil port A" is not in communication with the oil port P3, and the second control valve (8) does not output the pressure oil.~~

~~3~~2. The automatic tensioning control system for the hoisting wire rope according to claim ~~2~~1, wherein

the hoisting motor control system further comprises:

a hydraulic control handle (5), wherein the hydraulic control handle (5) is provided with

an operation input portion N2, an oil port P4 and an oil port C2; and

a second shuttle valve (3), wherein the second shuttle valve (3) is provided with an oil port a', an oil port b' and an oil port c';

wherein the oil port P4 is connected to the oil port P2, the oil port C2 is connected to the oil port b', the oil port A" is connected to the oil port a', the oil port c' is connected to the oil port a, and the oil port T2 is connected to the oil tank;

after the operation input portion N2 is operated, the oil port P4 is in communication with the oil port C2, and the hydraulic control handle (5) outputs the pressure oil to act on the oil port a; and when the operation input portion N2 is not operated, the oil port P4 is not in communication with the oil port C2, and the hydraulic control handle (5) does not output the pressure oil.

43. The automatic tensioning control system for the hoisting wire rope according to claim 32, wherein

the hydraulic control handle (5) is further provided with an operation input portion N1 and an oil port C1; the first control valve (2) is further provided with an oil port b;

when the first control valve (2) is provided with the oil port b, the oil port C1 is connected to the oil port b; after the pressure oil acts on the oil port b, the oil port A' is in communication with the oil port T, the oil port B' is in communication with the oil port P, and the first hydraulic pump (4) pumps the oil to the oil port B to drive the motor (1) to rotate forward;

after the operation input portion N1 is operated, the oil port P4 is in communication with the oil port C1, and the hydraulic control handle (5) outputs the pressure oil to act on the oil port b; and when the operation input portion N2 is not operated, the hydraulic control handle (5) does not output the pressure oil.

54. The automatic tensioning control system for the hoisting wire rope according to claim

43, wherein

the hoisting motor control system further comprises:

a first shuttle valve (7), wherein the first shuttle valve (7) is provided with an oil port a", an oil port b" and an oil port c"; and

a pressure switch (7), wherein the pressure switch (7) is provided with a detection port;

wherein the controller (10) is further provided with a signal input end I2, and the signal input end I2 is connected to a signal output end of the pressure switch (7); the oil port a" is connected to the oil port C2, the oil port b" is connected to the oil port C1, and the oil port c" is connected to the detection port.

~~6. The automatic tensioning control system for the hoisting wire rope according to claim 1, wherein~~

~~the hoisting motor control system comprises:~~

~~the motor (1), wherein the motor (1) is provided with an oil port A and an oil port B;~~

~~a first hydraulic pump (4), wherein the first hydraulic pump (4) is provided with an oil port P1 and an oil port T1; and~~

~~a first control valve (2), wherein the first control valve (2) is provided with a signal input end I2, an oil port A', an oil port B', an oil port P and an oil port T;~~

~~wherein the oil port A' is connected to the oil port A, the oil port B' is connected to the oil port B, the oil port P is connected to the oil port P1, and the oil port T and the oil port T1 are both connected to an oil tank;~~

~~after a signal is input into the signal input end I2, the oil port A' is in communication with the oil port P, the oil port B' is in communication with the oil port T, and the first hydraulic pump (4) pumps an oil to the oil port A to drive the motor (1) to rotationally reverse; when no signal is input into the signal input end I2, the oil port P, the oil port B', the oil port A' and the~~

~~oil port T are not in communication with each other;~~

~~the adjustment device comprises:~~

~~a tension detector (11); and~~

~~a controller (10), wherein the controller (10) is provided with a signal input end I1, a signal output end O1 and a tension determining module;~~

~~wherein the signal output end O1 is connected to the signal input end I2; a signal output end of the tension detector (11) is connected to the signal input end I1 to transmit a current wire rope tension signal to the controller (10); and~~

~~the tension determining module is configured to send out a current signal to the signal input end I2 after determining that the current wire rope tension is less than the preset tension.~~

~~7. The automatic tensioning control system for the hoisting wire rope according to claim 6, wherein~~

~~the controller (10) is further provided with a signal output end O2; the first control valve (2) is further provided with a signal input end I3; the signal output end O2 is connected to the signal input end I3; after a forward rotation signal sent out by the controller (10) is input into the signal input end I3, the oil port A' is in communication with the oil port T, and the oil port B' is in communication with the oil port P; and the first hydraulic pump (4) pumps the oil to the oil port B to drive the motor (1) to rotate forward.~~

~~8~~5. The automatic tensioning control system for the hoisting wire rope according to any one of claims 2-~~7~~4, wherein

the controller (10) further comprises a safety condition determining module, wherein the safety condition determining module is configured to collect a current working condition and send out a control signal to enable the tension determining module to work when a safety

condition is satisfied.

~~9~~6. A diaphragm wall grab machine, comprising the automatic tensioning control system for the hoisting wire rope according to claim 1.