CLAIMS

1. A control valve comprising an oil circuit provided between a first port G (8) and a second port F (9), and an oil circuit provided between a third port H (10) and a fourth port E (11); wherein, a first balance valve connected in series with a switch valve (12) is provided in the oil circuit between the first port G (8) and the second port F (9);

wherein a second balance valve is provided on the oil circuit between the third port H (10) and the fourth port E (11);

wherein the first balance valve comprises a first one-way functional portion (4) and a first overflow function portion (5), and the second balance valve comprises a second one-way functional portion (6) and a second overflow function portion (7); the control port of the first overflow function portion (5) is in communication with a first oil mouth (17) located at one end of the oil inlet of the second one-way function portion (6) of the second balance valve; and the control port of the second overflow function portion (7) is in communication with a second oil mouth (14) located at one end of the oil inlet of the first one-way function portion (4) of the first balance valve; and a third oil mouth (15) located at one end of the oil inlet of the first overflow function portion (5) of the first balance valve is connected to the second port F (9); and the second oil mouth (14) is connected to the first port G (8), the first oil mouth (17) is connected to the third port H (10); and a fourth oil mouth (16) located at one end of the oil inlet of the second overflow function portion (7) of the second balance valve is connected to the fourth port E (11).

2. The control valve according to claim 1, wherein the first balance valve, the second balance valve, and the switch valve (12) are integrated in one valve body, the first port G (8), the second port F (9), the third port H (10) and the fourth port E (11) are located on a surface of the valve body.

3. The control valve according to claim 1, wherein both the first overflow function portion (5) and the second overflow function portion (7) are pilot type structures, and a spring side control cavity of the first overflow function portion (5) communicates with the oil outlet of the first overflow function portion (5), a spring-free side control cavity of the first overflow function portion (5) communicates with the oil inlet of the first overflow function portion (5); and a spring side control cavity of the second overflow function portion (7) communicates with the oil outlet of the second overflow function portion (7), and a spring-free side control cavity of the second overflow

function portion (7) is in communication with the oil inlet of the second overflow function portion (7).

4. The control valve according to claim 2, wherein the switch valve (12) is provided on an oil circuit between the first port G (8) and the first balance valve, and the control valve further comprises a hydraulic sensor (18) configured to monitor the pressure on the oil circuit between the switch valve (12) and the first balance valve; an electronic control unit electrically connected to the hydraulic sensor (18); and an alarm device electrically connected to the electronic control unit.

5. The control valve according to claim 4, wherein the valve body surface is further provided with a fifth port M (13), and the fifth port M (13) is connected to the oil circuit between the switch valve (12) and the first balance valve, and the hydraulic sensor (18) is arranged on the fifth port M (13).

6. A derricking cylinder, wherein comprising: a hydraulic cylinder and a control valve according to any one of claims 1 to 5, the hydraulic cylinder being a single rod double acting piston type hydraulic cylinder, the second port F (9) communicates with the rodless cavity (1) of the hydraulic cylinder, and the fourth port E (11) communicates with the rod cavity (2) of the hydraulic cylinder.

7. A working method of a derricking cylinder, wherein the derricking cylinder comprises a hydraulic cylinder and the control valve according to claim 1, the hydraulic cylinder is a single rod double acting piston type hydraulic cylinder, a second port F (9) is in communication with the rodless cavity (1) of the hydraulic cylinder, and the fourth port E (11) is in communication with a rod cavity (2) of the hydraulic cylinder; the working method comprises:

when the amplitude varies upwardly, the switch valve (12) being turned on, and pressure oil flowing from the first port G (8) into the control valve, and flowing out of the control valve from the second port F (9) through the switch valve (12) and the first balance valve, and then flowing into the rodless cavity (1) of the hydraulic cylinder, the oil in the rod cavity (2) of the hydraulic cylinder flowing from the fourth port E (11) into the control valve, and flowing out of the control valve from the third port H (10) through the second balance valve, and then entering the oil return system, the piston rod (3) of the hydraulic cylinder being extended;

when the amplitude varies downwardly, the switch valve (12) being turned on, and the pressure oil flowing into the control valve from the third port H (10), and flowing out of the control valve from the fourth port E (11) through the second balance valve, then flowing into the rod cavity (2) of the hydraulic cylinder, the oil in the rodless cavity (1) of the hydraulic cylinder flowing from the second port F (9) into the control valve, and flowing out of the control valve from the first port G (8) through the switch valve (12) and the first balance valve, and then entering the oil return system, the piston rod (3) of the hydraulic cylinder being retracted;

when at rest, no pressure oil flowing into the control valve, and the switch valve (12) being cut off, the oil in the rodless cavity (1) of the hydraulic cylinder being sealed by the control valve.

8. The working method according to claim 7, wherein the switch valve (12) is a two-position two-way solenoid valve, and the control valve further comprises an electronic control unit electrically connected to the switch valve (12), that conduction and interruption of the switch valve (12) is controlled by the electronic control unit.

9. The working method according to claim 7, wherein the switch valve (12) is provided on the oil circuit between the first port G (8) and the first balance valve, and the control valve further comprises a hydraulic sensor (18) configured to monitor the pressure on the oil circuit between the switch valve (12) and the first balance valve; an electronic control unit electrically connected to the hydraulic sensor (18); and an alarm device electrically connected to the electronic control unit; when the hydraulic sensor (18) detects that the pressure on the oil circuit between the switch valve (12) and the first balance valve deviates from a preset range, the electronic control unit controls the alarm device to perform an alarm.