DOUBLE-WHEEL SLOT MILLING MACHINE

Cross-Reference to Related Applications

[0001] The present application is based on and claims priority of an application with a filing number of 202011057193.6 and a filing date of September 29, 2020, the disclosure of which is entirely incorporated herein by reference.

Field of the Invention

[0002] The present disclosure relates to a field of engineering machinery, and particularly to a double-wheel slot milling machine.

Background of the Invention

[0003] The double-wheel slotting machine is an underground continuous wall slotting device, with a maximum construction depth of more than 150m. In order to improve a slotting accuracy at a large depth, the double-wheel slotting machine is provided with a deviation rectifying device, which can rectify a deviation of a mill support in real time when the mill support is inclined due to reasons such as a stratum change.

Summary of the Invention

[0004] In related arts acquired by the inventor, during hard rock milling, a rock protrusion, i.e., a milling 'blind zone', will be left in a middle of a rock wall due to a rock breaking mechanism of a milling wheel. On the one hand, the rock protrusion will extrude a push plate of a deviation rectifying device during rectification, resulting in a deformation of the push plate, which affects a deviation rectifying stability and a grooving precision. On the other hand, the rock protrusion may lead to jamming of a mill support, which affects a hard rock milling efficiency.

[0005] In view of the above issues, the present disclosure provides a double-wheel slot milling machine and a deviation rectifying device thereof, so as to improve a deviation rectifying stability and a slotting precision of the deviation rectifying device.

[0006] A first aspect of the present disclosure provides a deviation rectifying device of a double-wheel slot milling machine, comprising:

[0007] a push plate, comprising a bottom plate, and a top plate which is located above the bottom plate and

a mill support 4, milling wheels 6 provided at a bottom of the mill support 4, and deviation rectifying devices provided on lateral surfaces of the mill support 4. The double-wheel slot milling machine is located within slot walls 5.

[0028] As illustrated in FIG. 3, when the mill support 4 is inclined within the slot walls, push plates of the deviation rectifying devices located at a lower left corner and an upper right corner are respectively pushed out in directions indicated by arrows under actions of respective oil cylinders (each push-out direction is perpendicular to a side plate of the mill support) until the push plates abut against the slot walls, at which time the slot walls generate reaction forces on the push plates. As the oil cylinders and the push plates are continually pushed out, the reaction forces generated by the slot walls on the push plates of the deviation rectifying devices will make the mill support 4 rotate counterclockwise until achieving a vertical state.

[0029] The mill support 4 of the double-wheel slot milling machine of this embodiment has a quadrate structure and comprises four lateral surfaces circumferentially enclosing. The four lateral surfaces comprise two first lateral surfaces parallel to an axis of the milling wheels 6 and two second lateral surfaces perpendicular to the axis of the milling wheels 6. The first lateral surface is provided with a first deviation rectifying device 1, and the second lateral surface is provided with a second deviation rectifying device 2. As illustrated in FIG. 4, a first rock wall protrusion 51 is formed on a first slot wall parallel to the axis of the milling wheel 6, and a second rock wall protrusion 52 is formed on a second slot wall perpendicular to the axis of the milling wheel 6. The two second deviation rectifying devices 2 located on a same lateral surface of the mill support 4 are located on two sides of the second rock wall protrusion 52, respectively. During operation, the second deviation rectifying device 2 and the second rock wall protrusion 52 are separated from each other, so the second rock wall protrusion 52 has no influence on the action of the second deviation rectifying device 2. However, the first rock wall protrusion 51 is located in a middle of the first deviation rectifying device 1, so the first rock wall protrusion 51 will adversely affect the deviation rectification by the first deviation rectifying device 1.

[0030] In order to solve the above problem, as illustrated in FIGS. 5 to 7, an embodiment of the present disclosure improves the first deviation rectifying device 1, which comprises a push plate 12 provided with an avoidance slot 124 penetrating along a longitudinal direction X. As shown in FIG. 5， the longitudinal direction X refers to the height direction.

[0031] During operation of the first deviation rectifying device 1 of the embodiment of the present disclosure, referring to FIG. 4, the first rock wall protrusion 51 on the slot wall 5 will enter the avoidance slot 124, so as to prevent the push plate 12 of the first deviation rectifying device 1 from being extruded with the

Claims

1. A double-wheel slot milling machine, comprising a mill support (4), milling wheels (6) arranged at a bottom of the mill support (4) and a deviation rectifying device, wherein the mill support (4) comprises two opposite first lateral surfaces parallel to an axis of the milling wheel (6) and two opposite second lateral surfaces perpendicular to the axis of the milling wheel (6), and each of the first lateral surfaces is provided with one deviation rectifying device, the deviation rectifying device comprising a push plate (12) and a deviation rectifying body (11) which is located inside of the push plate (12),

the push plate (12) comprises a bottom plate (121) and a top plate which is located outside of the bottom plate (121), the bottom plate (121) is rotatably connected to the deviation rectifying body (11), the top plate is provided with an avoidance slot (124) penetrating along a longitudinal direction (X).

2. The double-wheel slot milling machine according to claim 1, wherein the top plate comprises two sub-top plates (122) respectively located on two sides of the avoidance slot (124), ,and a gap between the two sub-top plates (122) forms the avoidance slot (124).

3. The double-wheel slot milling machine according to claim 1 or 2, wherein the avoidance slot (124) penetrates the top plate in a thickness direction thereof.

4. The double-wheel slot milling machine according to any one of claims 1 to 3, wherein an upper longitudinal end of the bottom plate (121) being bent toward the deviation rectifying body (11) to cover a space between the bottom plate (121) and the deviation rectifying body (11).

5. The double-wheel slot milling machine according to any one of claims 1 to 4, wherein the avoidance slot (124) comprises a flared section (1241) located at a lower longitudinal end.

6. The double-wheel slot milling machine according to claim 5, wherein the avoidance slot (124) comprises a flared section (1241) located at an upper longitudinal end.

7. The double-wheel slot milling machine according to any one of claims 1 to 6, wherein the push plate (12) comprises two sub-top plates (122) respectively located on two sides of the avoidance slot (124), and an outer

surface of each of the sub-top plates (122) comprises inclined sections (1221) located at the longitudinal ends.