A GEOLOGICAL MINERAL EXPLORATION SAMPLING EQUIPMENT

Field of the Invention

This invention belongs to the field of geological and mineral exploration technology, and specifically relates to a geological mineral exploration sampling device.

Background to the Invention

Geological minerals refer to the mineral resources buried beneath the land. Before mining geological minerals, it is necessary to take samples of the current area's geological soil to facilitate subsequent laboratory personnel to analyze the sampled soil samples and determine the mineral resource situation and distribution in the current area. When taking samples of geological minerals, professional sampling tools will be used to process the soil sampling. The existing sampling devices, depending on the different usage scenarios, will use different tools, including handheld sampling machines. By using the rotation of the drill rod, the soil is broken and removed from the current area.

The patent document with the Chinese patent number CN222545011U discloses a geological mineral exploration sampling device. It includes an installation frame. The top of the installation frame is fixedly installed with an installation plate. The bottom of the installation frame is equipped with a drilling component. The drilling component includes an electric push rod, a motor and a drill rod. At the bottom of the installation frame and outside the motor, a first protective cover is fixedly installed. The outer side of the first protective cover is equipped with a second protective cover. The second protective cover is symmetrically fixedly installed on both sides of the fixed plate. The top of the fixed plate is fixedly installed with a spring. One end of the spring is fixedly installed with an installation block. One side of the installation block is fixedly installed on the outer side of the first protective cover.

This sampling device, through the establishment of multiple components, can effectively prevent stones from splashing onto the surrounding operators. However, there are certain problems in actual use. Specifically, the movement trajectory of the drill rod has not been limited, resulting in the subsequent equipment being prone to deviation in the drilling angle during the soil drilling process, causing the drilling depth not to reach the expected situation, so that the equipment cannot sample the soil at the predetermined depth, affecting the working quality of the equipment itself.

Statement of Invention

The purpose of this section is to summarize some aspects of the implementation methods of the present invention and briefly introduce some preferred implementation methods. In this section as well as in the abstract and title of the application, some simplifications or omissions may be made to avoid making the purpose of this section, the abstract and the title ambiguous, but such simplifications or omissions cannot be used to limit the scope of the invention.

To solve the problems raised in the background technology, the present invention adopts the following technical solutions.

A geological mineral exploration sampling equipment, including a limit mechanism and a sampling mechanism. The sampling mechanism is a handheld drilling machine for drilling soil and taking samples. The side of the sampling mechanism is equipped with a limit mechanism that limits the moving trajectory and the angle of penetration of the sampling mechanism into the ground. The limit mechanism is equipped with a limit component that controls the moving trajectory of the sampling mechanism.

As a preferred technical solution of the present invention, the limit component includes a calibration plate. The calibration plate is set on the side of the sampling mechanism, and the calibration plate has a guide slot. The sampling mechanism moves along the length direction of the guide slot.

As a preferred technical solution of the present invention, the limit component includes a guide plate and a blocking plate. The guide plate is set on the side of the sampling mechanism, and the blocking plate is symmetrically installed on the side of the guide plate.

As a preferred technical solution of the present invention, the limit mechanism includes a sliding block, an adjusting arm and a positioning base plate. The sampling mechanism is installed on the side of the limit mechanism, and the sliding block slides along the length direction of the limit component. The adjusting arm is symmetrically installed on both sides of the limit component, and the end of the adjusting arm is equipped with a positioning base plate. The positioning base plate has a slot, and a positioning inserted link is slidably installed in the slot. The positioning inserted link enters the ground through the slot, and the side wall of the adjusting arm is equipped with an extension connecting rod, and the other end of the extension connecting rod is connected to the side wall of the limit component.

As a preferred technical solution of the present invention, one end of the extension connecting rod is equipped with a rotating group, and the other end is equipped with a connection seat. The rotating seat is connected to the side wall of the adjusting arm, and the connection seat is connected to the side wall of the limit component.

As a preferred technical solution of the present invention, the adjusting arm, the positioning base plate, the positioning inserted link and the extension connecting rod form a limit component for positioning the sampling mechanism.

As a preferred technical solution of the present invention, the sampling mechanism mainly consists of a drill rod and a drive motor. The output end of the drive motor is equipped with a drill rod, which drills and takes samples of the soil.

Compared with the prior art, the beneficial effects of the present invention are:

Through the establishment of the limit mechanism and the sampling mechanism in the present invention, the soil in the target area is drilled and sampled. And using the limit component in the limit mechanism, the position of the sampling mechanism is limited, allowing the sampling mechanism to operate in a stable state. And during use, the limit component can reduce the left-right shaking of the sampling mechanism, allowing the operator to press the sampling mechanism. The establishment of the limit component in the present invention includes a calibration plate with a guide slot, allowing the sampling mechanism to move stably along the length direction of the guide slot, limiting the moving trajectory of the sampling mechanism. The establishment of the limit component in the present invention includes a guide plate and a blocking plate. The guide plate assists the sampling mechanism to move stably, and the blocking plate can block the soil splashed when the sampling mechanism runs, making the overall working quality of the sampling equipment more stable, and allowing the sampling equipment to penetrate to the target depth to take samples of the soil at the target depth.

Brief Description of the Drawings

FIG. 1 is the three-dimensional diagram of the overall structure of the present invention.

FIG. 2 is the three-dimensional diagram of the back structure of the limit mechanism and the sampling mechanism of the present invention.

FIG. 3 is the three-dimensional diagram of the structure of the limit mechanism.

FIG. 4 is the front view of the structure of the limit mechanism in the present invention and the limit component in implementation method 1.

FIG. 5 is the three-dimensional diagram of the structure of the limit component in implementation method 2.

The corresponding relationship between the various figure annotations and the component names is as follows:

1. limit mechanism; 11. limit component; 111. calibration plate; 112. guide plate; 113.

blocking plate; 12. sliding block; 13. adjusting arm; 14. positioning base plate; 15. positioning pin; 16. extension connecting rod; 2. sampling mechanism.

Detailed Description

To make the above purposes, features and advantages of the present invention more clearly and understandably, the specific implementation methods of the invention are elaborated in detail below in conjunction with the attached drawings.

In the following description, many specific details are elaborated to facilitate a full understanding of the invention, but the invention can also be implemented in other ways different from those described herein. Those skilled in the art can make similar extensions without departing from the essence of the invention. Therefore, the present invention is not limited by the specific implementation methods disclosed below.

Secondly, the term "an implementation method" or "the implementation method" herein refers to specific features, structures or characteristics that can be included in at least one implementation mode of the invention. In this specification, "in an implementation method" appearing in different places does not necessarily refer to the same implementation method, nor is it mutually exclusive with other implementation methods selected separately. The present invention provides the following implementation methods.

Implementation method 1

As shown in FIG. 1 and FIG. 2, it is a structural schematic diagram of the geological and mineral exploration sampling equipment in this implementation method. In this implementation method, the geological and mineral exploration sampling equipment can limit the moving trajectory of the drilling machine and the angle of penetration into the soil when used, allowing the drilling machine to sample the soil at a predetermined depth. The geological and mineral exploration sampling equipment includes a limit mechanism 1 and a sampling mechanism 2. The sampling mechanism 2 is a handheld soil sampling drilling machine available on the market, and the sampling mechanism 2 is installed with a limit mechanism 1 on its side. The limit mechanism 1 limits the moving trajectory of the sampling mechanism 2, allowing the sampling mechanism 2 to enter the soil at a specific angle and manner.

It is worth noting that the sampling mechanism 2 mainly consists of a driving component and a drill rod. The output end of the driving component is installed with a drill rod, which is a soil sampling drill rod available on the market, allowing multiple drill rods to be interconnected to extend and adjust the drilling depth.

As shown in FIG. 3 and FIG. 4, it is a structural schematic diagram of the limit mechanism

1 in this implementation method. The limit mechanism 1 includes a limit component 11, a sliding block 12 and an adjusting arm 13. The limit component 11 is installed on the side of the sampling mechanism 2, and the sampling mechanism 2 is installed with a sliding block 12. The sliding block 12 slides up and down within the limit component 11. The establishment of the limit component 11 limits the moving trajectory of the sampling mechanism 2. The limit component 11 is symmetrically installed on both sides with adjusting arms 13, and the ends of the adjusting arms 13 are installed with a positioning base plate 14. The positioning base plate 14 is in contact with the ground, and a hole is opened on the positioning base plate 14. A positioning inserted link 15 is inserted into the hole, and the positioning inserted link 15 locks the position of the positioning base plate 14.

It is worth noting that the side wall of the adjusting arm 13 is installed with a rotating seat, and the limit component 11 is symmetrically installed with a connection seat on the opposite side. The rotating seat and the connection seat are installed with an extension connecting rod 16, which limits the maximum rotation angle of the adjusting arm 13.

The adjusting arm 13, the positioning base plate 14, the positioning inserted link 15 and the extension connecting rod 16 form the limit component used for equipment positioning, allowing the equipment to be stably installed at the target position and ensuring the safety and stability of the limit mechanism 1 during use.

As shown in FIG. 4, it is a structural schematic diagram of the limit component 11 in this implementation method. The limit component 11 includes a calibration plate 111. The calibration plate 111 is a plate-shaped structure, and the internal of the calibration plate 111 is provided with a guide slot. The guide slot is connected with the sliding block 12. The establishment of the guide slot allows the sliding block 12 to slide stably along the length direction of the guide slot, limiting the moving trajectory and insertion angle of the sampling mechanism 2 during operation.

It is worth noting that after the calibration plate 111 is installed on the ground through the limit component, it can reduce the intense left-right vibrations generated by the sampling mechanism 2 during operation. At this time, the staff only need to press the grip part of the sampling mechanism 2 to make it move downward stably, reducing the staff's work pressure and avoiding the deviation of the sampling mechanism 2's own movement trajectory due to the vibration caused by the collision between the sampling mechanism 2 and the soil's stones and other impurities during operation.

Implementation method 2

As shown in FIG. 1 and FIG. 2, it is the structural schematic diagram of the geological and mineral exploration sampling equipment in this example. When used, this geological and mineral exploration sampling equipment can limit the movement trajectory of the drilling

machine and the angle of penetrating into the soil, allowing the drilling machine to sample the soil at the predetermined depth. The geological and mineral exploration sampling equipment includes a limit mechanism 1 and a sampling mechanism 2. The sampling mechanism 2 is an existing handheld soil sampling drilling machine, and the limit mechanism 1 is installed on the side of the sampling mechanism 2. The limit mechanism 1 limits the movement trajectory of the sampling mechanism 2, allowing the sampling mechanism 2 to enter the soil at a specific angle and manner.

It is worth noting that the sampling mechanism 2 mainly consists of a driving component and a drill rod. The output end of the driving component is equipped with a drill rod, which is a soil sampling drill rod used in the present case. Multiple drill rods can be connected with each other to extend and adjust the drilling depth.

As shown in FIG. 3 and FIG. 4, it is the structural schematic diagram of the limit mechanism 1 in this example. The limit mechanism 1 includes a limit component 11, a sliding block 12 and an adjusting arm 13. The limit component 11 is installed on the side of the sampling mechanism 2, and the sampling mechanism 2 is equipped with a sliding block 12. The sliding block 12 slides up and down in the limit component 11. With the establishment of the limit component 11, the movement trajectory of the sampling mechanism 2 is limited. The limit component 11 is symmetrically installed on both sides of the positioning arm 13, and the positioning arm 13 is equipped with a positioning base plate 14. The positioning base plate 14 is in contact with the ground, and there is an opening in the positioning base plate 14, and a positioning inserted link 15 is inserted into the opening. The positioning inserted link 15 locks the position of the positioning base plate 14.

It is worth noting that the side wall of the positioning arm 13 is equipped with a rotating seat, and the limit component 11 is symmetrically installed on the opposite side of the rotating seat. The rotating seat and the connecting seat are equipped with an extension connecting rod 16, which limits the maximum rotation angle of the positioning arm 13.

The positioning arm 13, the positioning base plate 14, the positioning inserted link 15 and the extension connecting rod 16 in this example form the limit component used for equipment positioning, allowing the equipment to be stably installed at the target position and ensuring the safety and stability of the limit mechanism 1 during use.

As shown in FIG. 5, it is the structural schematic diagram of the limit component 11 in this example. The limit component 11 includes a guide plate 112 and a blocking plate 113. The guide plate 112 is installed on the side of the sampling mechanism 2, and the blocking plate 113 is symmetrically installed on the side of the guide plate 112. The blocking plate 113 is in the arc shape. When the sampling mechanism 2 drills into the soil, the soil is

splashed around under the rotation of the drill rod. At this time, the blocking plate 113 forms a barrier between the staff and the drill rod, isolating the splashed soil, and reducing the impact of the splashed soil on the staff.

The above content is a further detailed explanation of the invention based on specific implementation methods. It should not be construed that the specific implementation of the invention is limited to these explanations. For ordinary technicians in the technical field to which the invention belongs, they can make simple deductions or replacements without departing from the concept of the invention, and all such deductions or replacements should be regarded as falling within the protection scope of the claims submitted for this invention.