(19) China National Intellectual Property Administration

(12) Utility Model Patent

(10) Publication Number CN 202026888 U
(45) Publication Date 11/09/2011

(21) Application No. **201120014896.0**
(22) Application Date **01/18/2011**
(73) Patentee **Shenzhen Tidal Electronics Co., Ltd.**
Address **518000 Building 4, Longbi Industrial City, Bantian, Longgang District, Shenzhen, Guangdong Province**
(72) Inventor **Yan Xuezong**
(74) Patent Agency **Standard Patent & Trademark Agent Ltd. 44217**
Agent **Guo Weigang**
(51) Int. Cl.
A42B1/10 (2006.01)
A42B1/24 (2006.01)

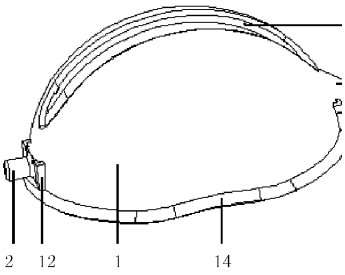
Claims 1 page Specifications 3 pages Drawings 2 pages

(54) Name of Utility Model

Mining Safety Helmet

(57) Abstract

This utility model relates to a safety helmet, specifically a mining safety helmet with an emergency lighting function. It comprises a helmet body, a mining lamp, and an LED lamp, both of which are detachably mounted on the helmet body. The helmet body is equipped with a first snap-fit slot and a second snap-fit slot, which have identical structures. The mining lamp is secured to the first snap-fit slot, while the LED lamp is secured to the second snap-fit slot. Additionally, the snap-fit mechanisms of the mining lamp and the LED lamp share the same structure. The mining safety helmet provided by this utility model allows the LED lamp, powered separately by a lithium battery, to serve as emergency lighting in the event of a mining lamp failure. This eliminates the need for immediate repair or replacement of the mining lamp, while also ensuring simple and convenient operation when switching to LED lighting. Additionally, the LED lamp has low power consumption, high brightness, and a compact size, making it easy to carry.



CN 202026888 U

1. A mining safety helmet, characterized in that it comprises a helmet body (1), a mining lamp (3), and an LED lamp (2), both of which are detachably mounted on the helmet body (1). The helmet body (1) is equipped with a first snap-fit slot (11) and a second snap-fit slot (12), which have identical structures. The mining lamp (3) is secured to the first snap-fit slot (11), while the LED lamp (2) is secured to the second snap-fit slot (12). Additionally, the snap-fit mechanisms of the mining lamp (3) and the LED lamp (2) share the same structure.

2. The mining safety helmet according to Claim 1, characterized in that the LED lamp (2) comprises an LED lamp body (22), an LED light source (21) located at the top of the LED lamp body (22), and one or a plurality of lithium batteries (23) located inside the LED lamp body (22), with the LED light source (21) connected to the one or plurality of lithium batteries (23).

3. The mining safety helmet according to Claim 1, characterized in that the first snap-fit slot (11) is located at the front of the helmet body (1), and the second snap-fit slot (12) is located at the rear of the helmet body (1).

4. The mining safety helmet according to Claim 3, characterized in that a guide groove (13) for guiding a mining lamp cable is also provided at the central top position of the helmet body (1), with the mining lamp (3) being connected to the mining lamp batteries via the mining lamp cable.

5. The mining safety helmet according to Claim 4, characterized in that the bottom of the helmet body (1) is also equipped with a brim (14), and the first snap-fit slot (11) and second snap-fit slot (12) are both located above the brim (14).

Milwaukee Electric Tool Corporation
Ex-1011
Page 2 of 8

Mining Safety Helmet

Technical Field

[0001] This utility model relates to a safety helmet, and more specifically, to a mining safety helmet with an emergency lighting function.

Background Technology

[0002] With the progress of society, the state has increasingly focused on mining safety. To enhance mining safety, improving and upgrading the functionality of mining safety helmets is one aspect. The mining safety helmet is an essential tool for miners working underground. It not only provides lighting but also effectively protects the miner's head from falling objects.

[0003] The traditional mining safety helmet consists of a mining lamp and a helmet body that holds the lamp in place, with the mining lamp powered by batteries. The traditional mining safety helmet only has the mining lamp as a lighting tool and does not have an emergency lighting function. Therefore, if the mining lamp fails during underground operations, it will directly lead to a work stoppage. According to the requirements, the miner should return to the surface for the repair or replacement of the mining lamp. However, returning to the surface usually takes 1 – 3 hours, which significantly impacts the efficiency of the mining operations. Some miners, in order to complete their work tasks, are unwilling to waste time returning to the surface and may choose to repair the mining lamp underground. Since the mining lamp is an explosion-proof light, repairing it underground in areas with high gas concentration could easily trigger a gas explosion or other mining accidents, which would seriously threaten the safety of the miners' lives.

Summary of Utility Model

[0004] The problem to be solved by this utility model is to address the deficiency of mining safety helmets in the prior art, which lack an emergency lighting function, by providing a mining safety helmet with an emergency lighting function.

[0005] The technical solution adopted by this utility model to solve the above problem is to provide a mining safety helmet. It comprises a helmet body, a mining lamp, and an LED lamp, both of which are detachably mounted on the helmet body. The helmet body is equipped with a first snap-fit slot and a second snap-fit slot, which have identical structures. The mining lamp is secured to the first snap-fit slot, while the LED lamp is secured to the second snap-fit slot. Additionally, the snap-fit mechanisms of the mining lamp and the LED lamp share the same structure.

[0006] In the mining safety helmet described in this utility model, the LED lamp comprises an LED lamp body, an LED light source located at the top of the LED lamp body, and one or a plurality of lithium batteries located inside the LED lamp body, with the LED light source connected to the one or plurality of lithium batteries.

[0007] In the mining safety helmet described in this utility model, the first snap-fit slot is located at the front of the helmet body, while the second snap-fit slot is located at the rear of the helmet body.

[0008] In the mining safety helmet described in this utility model, a guide groove for guiding a mining lamp cable is also provided at the central top position of the helmet body, with the mining lamp being connected to the mining lamp batteries via the mining lamp cable.

[0009] In the mining safety helmet described in this utility model, the bottom of the helmet body is also equipped with a brim, and both the first snap-fit slot and second snap-fit slot are located above the brim.

[0010] The mining safety helmet provided by this utility model offers the following benefits: the LED lamp, powered separately by a lithium battery, serves as emergency lighting in the event of a mining lamp failure. This eliminates the need for immediate repair or replacement of the mining lamp, while also ensuring simple and convenient operation when switching to LED lighting. Additionally, the LED lamp has low power consumption, high brightness, and a compact size, making it easy to carry.

Milwaukee Electric Tool Corporation
Ex-1011
Page 3 of 8

Description of the Drawings

[0011] Fig. 1 is an overall structural diagram of a preferred embodiment of the mining safety helmet of this utility model;

[0012] Fig. 2 is an overall structural diagram of a helmet body in the preferred embodiment of the mining safety helmet of this utility model;

[0013] Fig. 3 is an exploded structural diagram of the LED lamp in the preferred embodiment of the mining safety helmet of this utility model;

Specific Embodiments

[0014] This utility model will be described in further detail below with reference to the drawings and specific embodiments.

[0015] Please refer to Fig. 1, which is the overall structural diagram of the preferred embodiment of the mining safety helmet of this utility model. As shown in Fig. 1, the preferred embodiment of the mining safety helmet of this utility model comprises a helmet body 1, a mining lamp 3, and an LED lamp 2. The mining lamp 3 and the LED lamp 2 are both detachably mounted on the helmet body 1.

[0016] The structure of the helmet body 1 can be seen in Fig. 2 , which is a structural diagram of the helmet body 1 in the preferred embodiment of the mining safety helmet of this utility model. As shown in Fig. 2, the helmet body 1 comprises a first snap-fit slot 11, a second snap-fit slot 12, a guide groove 13, and a brim 14.

[0017] The first snap-fit slot 11 is located at the front of the helmet body 1, while the second snap-fit slot 12 is located at the rear of the helmet body 1. Therefore, the line connecting the center of the first snap-fit slot 11 and the center of the second snap-fit slot 12 is the axis of symmetry of the helmet body 1. The first snap-fit slot 11 and the second snap-fit slot 12 have identical structures, each consisting of two symmetrically arranged L-shaped slots. The function of the first snap-fit slot 11 is to secure the mining lamp 3, while the function of the second snap-fit slot 12 is to secure the LED lamp 2.

[0018] The guide groove 13 is located at the central top position of the helmet body 1, and the direction of the guide groove 13 is longitudinal, meaning the arc of the guide groove 13 divides the helmet body 1 into two equal left and right parts. The function of the guide groove 13 is to guide the mining lamp cable, preventing the cable from swinging freely and hindering mining operations. The function of the mining lamp cable is to connect the mining lamp 3 to the mining lamp batteries, and the function of the mining lamp batteries is to provide power to the mining lamp 3.

[0019] The brim 14 is located at the bottom of the helmet body 1 and encircles the bottom edge of the helmet body 1. Therefore, both the first snap-fit slot 11 and the second snap-fit slot 12 are located above the brim 14. The function of the brim 14 is to enhance protective coverage, effectively preventing small falling debris from entering the miner's eyes, ears, mouth, or nose.

[0020] The lamp body base of the mining lamp 3 is adapted to the first snap-fit slot 11. The two sides of the lamp body base can be snapped into the two L-shaped slots of the first snap-fit slot 11, and the width of the lamp body base is equal to the distance between the two L-shaped slots of the first snap-fit slot 11. In practical applications, the width of the lamp body base can also be designed to be slightly smaller than the distance between the two L-shaped slots of the first snap-fit slot 11, making it easier to insert the lamp body base into the first snap-fit slot 11 and remove it from the first snap-fit slot 11. By using this snap-fit connection method, the mining lamp 3 is not fixed permanently on the helmet body 1, but is instead installed on the helmet body 1 in a detachable manner. The function of the mining lamp 3 is to serve as the primary lighting tool, providing light for the miner under normal conditions.

[0021] The structure of the LED lamp 2 can be seen in Fig. 3, which is an exploded structural diagram of the LED lamp 2 in the preferred embodiment of the mining safety helmet of this utility model. As shown in Fig. 3, the LED lamp 2 comprises an LED light source 21, an LED lamp body 22, and lithium batteries 23. The function of the LED lamp 2 is to serves as an emergency lighting tool, providing light for the miner in special situations, such as when the mining lamp 3 is not functional.

[0022] The LED light source 21 is located at the top of the LED lamp body 22. It has low power consumption, high brightness, and a compact size, and its function is to emit light.

[0023] The lithium batteries 23 are located inside the LED lamp body 22 and are connected to the LED light source 21. Their function is to supply power to the LED light source 21. The number of the

Milwaukee Electric Tool Corporation
Ex-1011
Page 4 of 8

lithium batteries 23 used is determined by the model of the selected LED light source 21. In the preferred embodiment of this utility model, two lithium batteries 23 are used. In practical applications, the number of the lithium batteries 23 can be adjusted based on the model of the LED light source 21 and the required brightness.

[0024] The LED lamp body 22 houses the LED light source 21 and the lithium batteries 23. The base of the LED lamp body 22 has the same structure as the base of the mining lamp 3. The two sides of the base of the LED lamp body 22 can be inserted into the two L-shaped slots of the second snap-fit slot 12, and the width of the base of the LED lamp body 22 is equal to the distance between the two L-shaped slots of the second snap-fit slot 12. In practical applications, the width of the base of the LED lamp body 22 can also be designed to be slightly smaller than the distance between the two L-shaped slots of the second snap-fit slot 12, making it easier to insert the base of the LED lamp body 22 into the second snap-fit slot 12 and remove it from the second snap-fit slot 12. By using this snap-fit connection method, the LED lamp 2 is not fixed permanently on the helmet body 1, but is instead installed on the helmet body 1 in a detachable manner.

[0025] Since the snap-fit components of the mining lamp 3 and the LED lamp 2 have the same structure, the mining lamp 3 can also be inserted into the second snap-fit slot 12, and the LED lamp 2 can be inserted into the first snap-fit slot 11, meaning that the positions of the mining lamp 3 and LED lamp 2 can be swapped.

[0026] The following describes the method of using the mining safety helmet provided in the preferred embodiment of this utility model.

[0027] In normal conditions, the miner wears the mining safety helmet, with the mining lamp 3 secured in the first snap-fit slot 11 and the LED lamp 2 secured in the second snap-fit slot 12. The mining lamp batteries are either carried at the waist or placed in a backpack. The mining lamp cable connecting the mining lamp 3 and the mining lamp batteries is placed in the guide groove 13, effectively preventing the mining lamp cable from swinging freely and hindering mining operations. When the mining lamp 3 malfunctions and becomes unusable, the mining lamp 3 can be removed from the first snap-fit slot 11, and the LED lamp 2 can be taken out of the second snap-fit slot 12 and then inserted into the first snap-fit slot 11. In other words, the LED lamp 2 is used to replace the mining lamp 3. At this point, the mining lamp 3 can be inserted into the second snap-fit slot 12, effectively swapping the positions of the mining lamp 3 and the LED lamp 2. Alternatively, the mining lamp 3 can be placed elsewhere instead of being inserted into the second snap-fit slot 12. This reduces the weight of the mining safety helmet on the miner's head, and the miner does not need to carry the mining lamp cable and batteries.

[0028] The mining safety helmet provided by this utility model allows the LED lamp 2, powered independently by the lithium batteries 23, to serve as emergency lighting when the mining lamp 3 malfunctions, eliminating the need for immediate repair or replacement of the mining lamp 3. Generally, under the condition of meeting the lighting requirements, the working time of the LED lamp 2 can last for at least six hours, which is sufficient to support the lighting needs of a miner for one work cycle. When switching to the LED lamp 2 for lighting, the operation is simple and convenient. It only requires removing the mining lamp 3 and the LED lamp 2, then inserting the LED lamp 2 into the slot previously occupied by the mining lamp 3. At the same time, the LED lamp 2 has low power consumption, high brightness, and a compact the size, making it easy to carry. Therefore, the addition of the LED lamp 2 will not be a burden for miner to carry.

[0029] The above description represents only the embodiments of this utility model and does not limit the patent scope of this utility model. All equivalent structural modifications made using the content of the specifications and drawings of this utility model, whether directly or indirectly applied in other related technical fields, are similarly included in the scope of the patent protection of this utility model.

Milwaukee Electric Tool Corporation
Ex-1011
Page 5 of 8

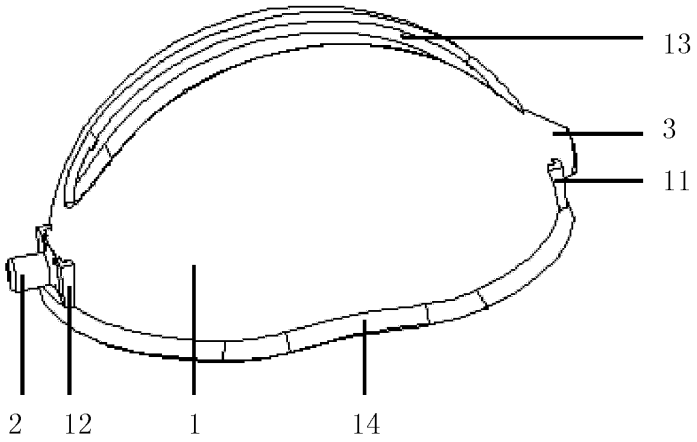


Fig. 1

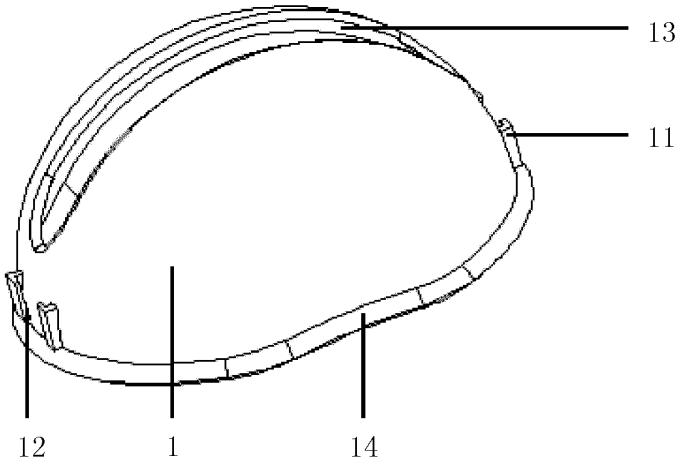


Fig. 2

Milwaukee Electric Tool Corporation
Ex-1011
Page 6 of 8

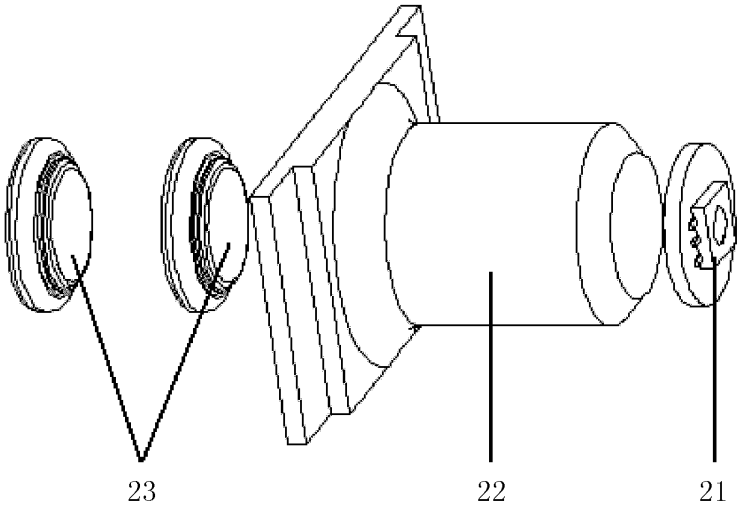


Fig. 3

Milwaukee Electric Tool Corporation
Ex-1011
Page 7 of 8

DECLARATION OF TRANSLATION

I, [Kenneth Su], declare the following:

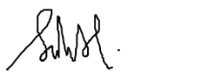
1. I am over 18 years of age and competent to make this declaration.

2. I am a qualified Chinese to English translator with more than [8] years of experience.

3. I have translated into English the attached document identified as "CN 202026888 U," bearing a publication date of [11/09/2011].

4. I affirm that the translated text has been translated and edited to the best of my ability and knowledge to accurately reflect the content, meaning, and style of the original text. I hereby certify under penalty of perjury under the laws of the United States of America that the foregoing constitutes, pursuant to my knowledge and belief, a true and correct translation of the original document.

5. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.



Kenneth Su

Dated and signed on __March 7, 2025_____