

A-SHAPED SAFETY LADDER

Technical Field

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The present invention relates to a device for climbing high operation, more specifically to an insulating A-shaped safety ladder used in construction sites. The device of the present invention is suitable for use in construction sites, such as building site, decoration site, maintenance site and so on. With the device of the present invention, safety at construction sites can be substantially improved.

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Background

Operation tools for assisting to climb up are usually used at building site, decoration site or maintenance site. Some local administrative regulations also stipulate that work platforms should be used when the working place is more than 2 meters above the ground. Currently, assistive tools for climbing high operation used at construction site are conventional step ladders. Chinese Patent CN200520063300.0 discloses a self-locking step ladder, comprising two vertical ladder bodies which are connected to each other through a connecting element. Said vertical ladder body consists of two ladder robs and a plurality of transverse pedals connected thereto at regularly spaced positions. The connecting element is formed by hinging a left connecting pair and a right connecting pair. The structures of current step ladders are similar, and generally have the following two common points: (1) the structure of two vertical ladder bodies is completely symmetrical with each other, and the transverse pedals are provided up to the peak of the ladder at regular intervals, that is, both sides of the step ladder are provided with pedals; and (2) most of the step ladders are made of metal materials.

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At the construction site, the working place for climbing high operation will be

often changed with the construction progress. To keep the effective working progress or avoid the inconvenience of climbing up and down and moving the ladder, some users will ride on the step ladder directly, cross the transverse pedals at two sides of the step ladder, and then move the ladder by foot. In this way, the ladder can be
5 moved to the left or right, or even to the front or back, by inertial moment of user's body so as to a new working place. Further, sometimes users will even stand on the peak of the ladder with both feet, which may accelerate the working progress. However, during the whole progress users must hold the ladder tightly with foot, and will easily fall down from the ladder and get hurt in case of any carelessness. On the
10 other hand, many electricity supply facilities are temporarily arranged at the construction site, and electric wires are frequently exposed on the construction ground. Therefore, the step ladder made of metal materials will make users get electric shock when it touches broken electric wires.

15 **Summary of the Invention**

On the basis of summarizing and studying causes of lots of accidents at the construction site, the present invention, aiming to overcome the defects of structures of conventional step ladders for assisting to climb up, provides an A-shaped safety
20 ladder, which can effectively reduce accidents at the construction site.

The present invention provides a technical solution as follows: An A-shaped safety ladder, comprising a front-side ladder body and a rear-side ladder body which are moveably connected with each other at the tops thereof, wherein said front-side
25 ladder body is connected with said rear-side ladder body through a foldable strut at the middle parts thereof, characterized in that: both of said front-side ladder body and rear-side ladder body are made of insulating materials, and configured in an asymmetrical manner with each other; said front-side ladder body comprises two vertical front supporting legs at the left and right sides thereof, and a plurality of
30 transverse pedals fixedly connected between the two front supporting legs, thus

forming a working platform for climbing up; said rear-side ladder body comprises two vertical rear supporting legs at the left and right sides thereof, and an upper connecting rod and a low connecting rod for connecting the tops and the bottoms of the two rear supporting legs respectively; and no transverse pedal is provided between
5 said upper connecting rod and said low connecting rod, thus forming a non-working platform without transverses pedals. According to the present invention, since only the front side forms the working platform, users cannot work through standing across both sides of the ladder, thus reducing the accident rate during the climbing high operation.

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A front blocking plate and a rear blocking plate for preventing users from climbing to the peak of the ladder are securely arranged at the upper parts of said front-side ladder body and said rear-side ladder body respectively. The front blocking plate can prevent users from climbing to the peak of the ladder, support user's body so
15 as to keep the user in balance during the climbing high operation, and also improve the strength and stability of the ladder. Moreover, the distance between the uppermost transverse pedal of said front-side ladder body and the hinge joint between the top of the front-side ladder body and the top of the rear-side ladder body is at least 800 mm, which can eliminate the dangerous activities of users in climbing to the peak of the
20 ladder and moving the ladder by foot.

Both of said front-side ladder body and rear-side ladder body are made of insulating wood materials or engineering plastics materials. Thus the device of the present invention is entirely insulated, and therefore can prevent users from electrical
25 shock injuries.

Anti-skid slots are provided on the upper surface of said transverse pedal. The height of said front blocking plate and said rear blocking plate is in a range of 250-450 mm. Said transverse pedal is with a width of 70-80 mm and a thickness of
30 15-25 mm.

As compared with the prior arts, according to the present invention, transverse pedals are only provided on one side of the A-shaped safety ladder, with no transverse pedals on the other side of the ladder. Therefore, users are prevented from operating
5 by standing across both sides of the ladder, and then accidents are avoided. The distance between the uppermost transverse pedal on the one side of the A-shaped safety ladder according to the present invention and the peak of said ladder is relatively far; moreover, front and rear blocking plates are provided at the upper parts of the ladder bodies. Said front and rear blocking plates can prevent users from
10 climbing to the peak of the ladder and then dangerously moving the ladder by foot, provide body support for users so as to keep the users in balance during the climbing high operation, and also improve the strength and stability of the ladder. The ladder according to the present invention is made of insulating materials, thus preventing users from electrical shock injuries. Therefore, the ladder is safe for use.

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Brief Description of the Drawings

Fig. 1 schematically shows the structure of the A-shaped safety ladder according to the present invention.

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Specific Embodiments of the Invention

In the following the embodiments of the present invention will be explained in detail with reference to the attached drawing.

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As shown in Fig 1, the A-shaped safety ladder according to the present invention is mainly composed of a front-side ladder body 1 and a rear-side ladder body 2. The front-side ladder body 1 is articulated with the rear-side ladder body 2 at the tops thereof, and connected to the rear-side ladder body 2 through a strut 3 at the middle of
30 the sides thereof. Therefore, a structure with the shape of "A" is formed viewed from

one side.

Two front supporting legs 11 are provided at the left and right sides of the front-side ladder body 1 respectively, and a plurality of transverse pedals 12 are
5 securely connected between the front supporting legs 11 at two sides. The distance between adjacent transverse pedals 12 is about 305 mm, and can be suitably adjusted according to the height of the ladder. The transverse pedals 12 are designed as plates, with a width of 70-80 mm and a thickness of 15-25 mm, in order to increase the contacting surface with foot and improve the safety. The width and thickness of the
10 transverse pedal are 75 mm and 20 mm respectively in this embodiment of the present invention. Besides, anti-skid slots 16 with a cross section of the shape of "V" are provided on the upper surface of the transverse pedal 12, further improving the safety of the transverse pedal 12. To prevent users from climbing to the peak of the ladder and thus causing unintentional falls, the distance between the uppermost transverse
15 pedal 12 of the front-side ladder body 1 and the hinge joint between the front-side ladder body 1 and the rear-side ladder body 2 is not less than 800 mm. The distance in this embodiment of the present invention is 845 mm.

Two rear supporting legs 21 are provided at the left and right sides of said
20 rear-side ladder body 2 respectively. The tops and the bottoms of the rear supporting legs 21 at both sides are connected to each other through an upper connecting rod 22 and a low connecting rod 23 respectively, thus forming a substantial trapezoid-shaped structure. No transverse pedals are provided between the upper connecting rod 22 and the low connecting rod 23. Thus, users cannot work through standing across the
25 front-side and rear-side ladder bodies, and further cannot move the ladder through holding the ladder with their feet. Therefore, the above-mentioned dangerous activities can be avoided to the most possible extent.

Moreover, a front blocking plate 15 is arranged on the outer surface of the front
30 supporting legs 11 of both sides at the upper part of said front-side ladder body 1, and

a rear blocking plate 25 is arranged on the outer surface of the rear supporting legs 21 of both sides at the upper part of said rear-side ladder body 2. The height of the front and rear blocking plates is in a range of 250-450 mm, and in this embodiment is 330 mm. The advantage of providing the front blocking plate 15 and the rear blocking plate 25 is to prevent users from climbing to the peak of the ladder or moving the ladder by holding both sides of the ladder. Further, it also can provide body support for users so as to keep them in balance, and also improve the strength and stability of the ladder.

10 In order to prevent electrical shock injuries caused by the ladder, both of said front-side ladder body 1 and said rear-side ladder body 2 are made of insulating wood materials. The front supporting leg 11 and the transverse pedals 12 are fixed to each other with tongue and groove joints, and the upper connecting rod 22 and the low connecting rod 23 are fixed to the rear supporting leg 21 with tongue and groove joints as well.

The middle part of the strut 3 which connects with the front-side ladder body 1 and the rear-side ladder body 2 is rotatable. When in use, both sides of the strut 3 will expand to form a straight line shape, so that the front-side ladder body 1 and the rear-side ladder body 2 are separated from each other, thus forming an "A" shape. When not in use, the strut 3 can be folded from both sides, so that the front-side ladder body 1 and the rear-side ladder body 2 are folded together. Therefore, it is convenient to restore and move the ladder.

25 It should be noted that the above-mentioned embodiment shows particularly preferred one but that this is not restricted thereto. Any amendments, equivalents or improvements made under the spirit and principle of the present invention shall be included in the protection scope of the present invention.

Claims

1. An A-shaped safety ladder, comprising a front-side ladder body (1) and a rear-side ladder body (2) which are moveably connected with each other at the tops thereof, wherein said front-side ladder body (1) is connected with said rear-side ladder body (2) through a foldable strut (3) at the middle parts thereof, characterized in that, both of said front-side ladder body (1) and rear-side ladder body (2) are made of insulating materials and configured in an asymmetrical manner with each other;

said front-side ladder body (1) comprises two vertical front supporting legs (11) at the left and right sides thereof, and a plurality of transverse pedals (12) securely connected between the two front supporting legs (11), thus forming a working platform for climbing up; said rear-side ladder body (2) comprises two vertical rear supporting legs (21) at the left and right sides thereof, and an upper connecting rod (22) and a low connecting rod (23) for connecting the tops and the bottoms of the two rear supporting legs (21) respectively; and no transverse pedal is provided between said upper connecting rod (22) and low connecting rod (23), thus forming a non-working platform without transverses pedals; and

a front blocking plate (15) and a rear blocking plate (25) are securely arranged at the upper parts of said front-side ladder body (1) and said rear-side ladder body (2) respectively, in order to prevent users from climbing to the peak of the ladder.

2. The A-shaped safety ladder according to claim 1, characterized in that, anti-skid slots (16) are provided on the upper surface of said transverse pedal (12).

3. The A-shaped safety ladder according to claim 1 or 2, characterized in that, said front-side ladder body (1) and said rear-side ladder body (2) are made of wood materials.

4. The A-shaped safety ladder according to claim 1 or 2, characterized in that, said front-side ladder body (1) and said rear-side ladder body (2) are made of

engineering plastic materials.

5. The A-shaped safety ladder according to claim 1 or 2, characterized in that, the distance between the uppermost transverse pedal (12) of said front-side ladder body (1) and the hinge joint between the front-side ladder body (1) and the rear-side ladder body (2) is not less than 600 mm.

6. The A-shaped safety ladder according to claim 1 or 2, characterized in that, the height of said front blocking plate (15) and the rear blocking plate (25) is in a range of 250-450 mm.

7. The A-shaped safety ladder according to claim 1 or 2, characterized in that, said transverse pedal (12) is with a width of 70-80 mm and a thickness of 15-25 mm.

8. The A-shaped safety ladder according to claim 3, characterized in that, the front supporting leg (11) and the transverse pedal (12) are fixed to each other with tongue and groove joints, and the upper connecting rod (22) and the low connecting rod (23) are fixed to the rear supporting leg (21) with tongue and groove joints.

9. The A-shaped safety ladder according to claim 4, characterized in that, both of said front-side ladder body (1) and rear-side ladder body (2) are made through injection molding.