

SLIDING STRUCTURE MATCHED BETWEEN STANDARD SECTION AND JACKING SLEEVE FRAME OF TOWER CRANE

TECHNICAL FIELD

5 The present invention relates to a tower crane, particularly to a sliding structure matched between a standard section and a jacking sleeve frame of a tower crane.

BACKGROUND

10 When a tower crane is working, the height of the tower body must be constantly adjusted to adapt to the rising height of the building, and the height adjustment of the tower body is usually achieved by adding new standard sections. In the prior art, the main limbs of the standard section are made from H-shaped steel, and the two vertical planes of the H-shaped steel main limbs of the standard section are used as the climbing track of a jacking sleeve frame. Four sliding blocks are arranged on the main limbs and crossbeams of the jacking sleeve frame. When the jacking sleeve frame that is sleeved on the outside of the standard section moves up and down, it makes contact with the standard section through the sliding blocks to slide up and down. However, when the two vertical planes of the H-shaped steel are used as the track surface on the main limb of the standard section in the prior art structure, it is necessary to ensure that the two planes have no curvature (e.g., concavity, convexity) from bottom to top in use, that is, slotting and the welding of the parts on the two planes. Therefore, the arrangement requirements for connecting the standard section with ear plates and treads are higher and more difficult, and the prior art structure cannot be used when the main limb is formed from other shaped structures, such as round steel.

25 SUMMARY

 The purpose of the present invention is to provide a sliding structure matched between a standard section and a jacking sleeve frame of a tower crane, which can overcome the disadvantages of poor sliding and high manufacturing requirements caused by using H-

shaped steel as the track in the prior art, so as to make the sliding coordination between the standard section and the jacking sleeve frame more rational.

To achieve the above purpose, the present invention provides a sliding structure matched between the standard section and the jacking sleeve frame of the tower crane. The sliding structure includes a standard section and a jacking sleeve frame. The standard section is of a space truss structure composed of four first main limbs and supporting rod members. Flange plates are fixedly arranged on an upper end face and a lower end face of each of the first main limbs. The flange plate includes an end right-angle sliding block, and the end right-angle sliding block is arranged on the outside of the cross section of the first main limb. The four end right-angle sliding blocks on the same plane form a rectangular plane. An intermediate right-angle sliding block is arranged between the upper end face and the lower end face of each of the first main limbs. The four intermediate right-angle sliding blocks on the same plane form a rectangular plane, and the four intermediate right-angle sliding blocks form a group. At least one group is arranged between the upper end faces and the lower end faces of the first main limbs. The projection of the rectangular plane formed by the end right-angle sliding blocks coincides with the projection of the rectangular plane formed by the intermediate right-angle sliding blocks. The jacking sleeve frame is of a space truss structure composed of four second main limbs and a supporting rod frame. Sliding ways are fixedly arranged on the inner sides of lower portions of the second main limbs. The jacking sleeve frame is sleeved outside the standard section. The jacking sleeve frame matches the end right-angle sliding blocks and the intermediate right-angle sliding blocks on the standard section by means of the sliding ways to allow the jacking sleeve frame to slide up and down.

Further, each of the upper end face and the lower end face of the sliding way has a chamfer angle.

Further, the first main limbs are made from round steel.

The advantages of the present invention are that the present invention abandons the

practice of using H-shaped steel as the sliding track surface in the prior art. The main limb of the standard section is not limited to facilitating the selection. By arranging sliding blocks (the end right-angle sliding blocks and the intermediate right-angle sliding blocks) on the main limbs of the standard section and setting the sliding way on the jacking sleeve frame, some interference is avoided when the jacking sleeve frame and the standard section slide relative to each other, and some disadvantages such as poor sliding caused by the use of H-shaped steel are overcome. In addition, the end of the sliding way is arranged on the flange plate of the standard section to save production costs and labor. The round steel used in the first main limb can reduce wind resistance and improve the construction safety of the tower crane.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a structural schematic view of a standard section of the present invention.

FIG. 2 is a top view of FIG. 1.

FIG. 3 is an A-A directional cross-section view of FIG. 1.

FIG. 4 is a perspective view showing a structure of a jacking sleeve frame.

FIG. 5 is an enlarged view at B in FIG. 4.

In the drawings, 1-standard section, 10-first main limb, 11-flange plate, 12-end right-angle sliding block, 13-intermediate right-angle sliding block, 2-jacking sleeve frame, 20-second main limb, 21-sliding way, 22-chamfer angle.

DETAILED DESCRIPTION OF THE EMBODIMENTS

As follows, the present invention is further described in detail in combination with the drawings and a specific embodiment.

As shown in FIG. 1, a sliding structure matched between a standard section and a jacking sleeve frame of a tower crane includes the standard section 1 and the jacking sleeve frame 2. The standard section 1 is of a space truss structure composed of four first main limbs 10 and supporting rod members. The Flange plates 11 are fixedly arranged on an upper

end face and a lower end face of each of the first main limbs 10. As shown in FIG. 2, the end right-angle sliding block 12 is provided on the flange plate 11, and the end right-angle sliding block 12 is arranged on the outside of the cross section of the first main limb 10. The four end right-angle sliding blocks 12 on the same plane form a rectangular plane. As shown in FIG. 3, the intermediate right-angle sliding block 13 is fixedly arranged between the upper end face and the lower end face of each of the first main limbs 10. The four intermediate right-angle sliding blocks 13 on the same plane form a rectangular plane, and the four intermediate right-angle sliding blocks 13 form a group. At least one group is arranged between the upper end faces and the lower end faces of the first main limbs 10. The projection of the rectangular plane formed by the end right-angle sliding blocks 12 coincides with the projection of the rectangular plane formed by the intermediate right-angle sliding blocks 13 so that the right-angle points of the end right-angle sliding blocks and the right-angle points of the intermediate right-angle sliding blocks are on the same vertical line. As shown in FIG. 4, the jacking sleeve frame 2 is of a space truss structure composed of four second main limbs 20 and supporting rods. Sliding ways 21 are fixedly arranged on the inner sides of lower portions of the second main limbs 20, and the height of the sliding way 21 is higher than that of the standard section 1. The jacking sleeve frame 2 is sleeved outside the standard section 1, and the jacking sleeve frame 2 matches the end right-angle sliding blocks 12 and the intermediate right-angle sliding blocks 13 on the standard section 1 by means of the sliding ways 21 to allow the jacking sleeve frame to slide up and down. As shown in FIG. 5, each of the upper end face and the lower end face of the sliding way 21 is set with the chamfer angle 22, which prevents the end right-angle sliding blocks 12 and the intermediate right-angle sliding blocks 13 on the standard section from getting stuck when passing through the upper and lower end of the sliding way.

The first main limb 10 is made from round steel. Firstly, the round steel has a small upwind area and low wind resistance, which can improve the safety of the external construction of the tower crane. Secondly, since the tower crane uses a large amount of steel, the use of round steel can save on production costs.

The embodiment of the present invention is described in detail in combination with the drawings above, but the present invention is not limited herein. The various changes, which are made within the scope of knowledge possessed by those skilled in the art and without departing from the purpose of the present invention, should fall within the protection scope

5 of the claims of the present invention.

CLAIMS

WHAT IS CLAIMED IS:

1. A sliding structure matched between a standard section and a jacking sleeve frame of a tower crane comprising a standard section (1) and a jacking sleeve frame (2); the standard section (1) is of a space truss structure composed of four first main limbs (10) and supporting rod members; flange plates (11) are fixedly arranged on an upper end face and a lower end face of each of the first main limbs (10), the flange plate (11) comprises an end right-angle sliding block (12), and the end right-angle sliding block (12) is arranged on the outside of the cross section of the first main limb (10); the four end right-angle sliding blocks (12) on the same plane form a rectangular plane; an intermediate right-angle sliding block (13) is fixedly arranged between the upper end face and the lower end face of each of the first main limbs (10); the four intermediate right-angle sliding blocks (13) on the same plane form a rectangular plane, the four intermediate right-angle sliding blocks (13) form a group, and at least one group is arranged between the upper end faces and the lower end faces of the first main limbs (10); the projection of the rectangular plane formed by the end right-angle sliding blocks (12) coincides with the projection of the rectangular plane formed by the intermediate right-angle sliding blocks (13); the jacking sleeve frame (2) is of a space truss structure composed of four second main limbs (20) and supporting rods; sliding ways (21) are fixedly arranged on inner sides of lower portions of the second main limbs (20); and the jacking sleeve frame (2) is sleeved outside the standard section (1), and the jacking sleeve frame (2) matches the end right-angle sliding blocks (12) and the intermediate right-angle sliding blocks (13) on the standard section (1) by means of the sliding ways (21) to slide up and down and each of the upper end face and the lower end face of the sliding way (21) has a chamfer angle (22).

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2. The sliding structure matched between the standard section and the jacking sleeve frame of the tower crane according to claim 1, wherein the first main limbs (10) are made from round steel.