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LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

11

N° de publication :

LU506849

12

BREVET D'INVENTION**B1**

21

N° de dépôt: LU506849

51

Int. Cl.:
E04G 13/06

22

Date de dépôt: 22/09/2023

30

Priorité:
14/08/2023 CN 202311016753.7

43

Date de mise à disposition du public: 14/02/2025

47

Date de délivrance: 14/02/2025

73

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CONSTRUCTION FORMWORK FOR ARC-SHAPED OVERHANGING EAVE OF BUILDING.

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A construction formwork for arc-shaped overhanging eave of building, which comprises a bottom formwork, an end formwork and a side formwork, the bottom formwork is supported below the overhanging eave through a scaffold, and two ends of the bottom formwork are correspondingly provided with the end formwork of the overhanging eave, the side formwork is located on an outer side of the overhanging eave, and two ends of the side formwork are correspondingly connected to an end surface; the side formwork comprises a flexible formwork, a support rod and an U-shaped connection piece, wherein a plurality of support rods are equidistantly distributed, and any adjacent two support rods are connected through the U-shaped connection piece, in response to the change of opening degree of the U-shaped connection piece by external force, the curvature of the arc corresponding to the side formwork is changed accordingly, and the flexible formwork is adhered closely to the inner side of the support rod to form the outer arc-shaped surface of the overhanging eave. A flexible formwork is disposed on the inner side of the support rod, the flexible formwork forms an outer arc-shaped surface of the overhanging eave, and the U-shaped connection piece connects the support rod, so that the opening degree of the U-shaped connection piece can be adjusted under the action of an external force; when the openings of the U-shaped connection piece change, the flexible formwork can adapt to different arc-shaped surfaces.

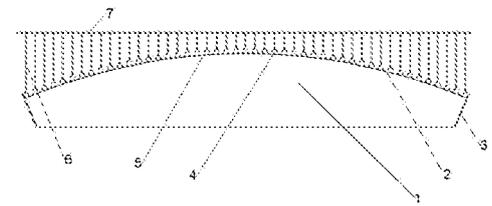


Fig. 1

CONSTRUCTION FORMWORK FOR ARC-SHAPED OVERHANGING EAVE OF BUILDING

Background

5 Field of the Invention

The present invention belongs to the technical field of architectural construction, and in particular to a construction formwork for arc-shaped overhanging eave of building.

Background Information

10 Modern architecture has unique design, high modeling quality requirements, the corresponding technical standards and construction is more difficult, and the construction technology is more complex, especially variable curvature arc-shaped fair-faced concrete exterior wall structure, the curvature radius changes more, the appearance quality requirements are strict, the appropriate formwork support system and the construction methods must be adopted to ensure the construction quality of arc-shaped structure.

15 In the prior art, the formwork for the overhanging arc-shaped surface of building comprises two types, namely, a steel formwork and a wood formwork, wherein the steel formwork needs to design steel forms with different heights and different curvatures according to the curvature of the arc-shaped surface, the manufacturing cost is very high and the manufacturing cycle is long, and the steel formwork is generally not used for turnover, and is not applicable to projects with a tight
20 construction period and high cost control requirements; the joint of arc-shaped surface is prone to slurry leakage, which results in the quality defects of honeycomb and hemp surface. However, the wood formwork usually decomposes the arc-shaped wall into several sections of straight formwork for formwork support, which is very easy to cause defects such as arc-shaped surface non-smooth (having edges and corners), structural dimension deviation, formwork joint, staggered platform, etc.
25 which increases the difficulty for construction and secondary repair, and even affects the acceptance of the work.

Accordingly, there is a need to provide an improved solution to the above-mentioned deficiencies of the prior art.

SUMMARY

30 It is an object of the present invention to provide a construction formwork for arc-shaped overhanging eave of building to overcome the above-mentioned shortcomings in the prior art.

In order to achieve the above-mentioned object, the present invention provides the following

technical solutions:

A construction formwork for arc-shaped overhanging eave of building comprises a bottom formwork, an end formwork and a side formwork, the bottom formwork is supported below the overhanging eave through a scaffold, and two ends of the bottom formwork are correspondingly provided with the end formwork of the overhanging eave, the side formwork is located on an outer side of the overhanging eave, and two ends of the side formwork are correspondingly connected to an end surface;

the side formwork comprises a flexible formwork, a support rod and an U-shaped connection piece, wherein a plurality of support rods are equidistantly distributed, and any adjacent two support rods are connected through the U-shaped connection piece, in response to the change of opening degree of the U-shaped connection piece by external force, the curvature of the arc corresponding to the side formwork is changed accordingly, and the flexible formwork is adhered closely to the inner side of the support rod to form the outer arc-shaped surface of the overhanging eave.

Advantageous effects:

A flexible formwork is disposed on the inner side of the support rod, the flexible formwork forms an outer arc-shaped surface of the overhanging eave, and the U-shaped connection piece connects the support rod, so that the opening degree of the U-shaped connection piece can be adjusted under the action of an external force; when the openings of the U-shaped connection piece change, the angles of two adjacent support rods change, so that the curvature of the arc corresponding to the side formwork can be changed; and the flexible formwork can change according to the change of the side formwork, and is supported by the support rod, so that different arc-shaped surfaces can be adapted.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram of the structure of construction formwork in the specific example provided by the present invention;

Fig. 2 is a schematic diagram of the connection structure of the support rod in the specific example provided by the present invention.

In the drawings:

1-overhanging eave; 2-flexible formwork; 3-end formwork; 4-support rod; 5-U-shaped connection piece; 6-locating rod; 7-horizontal frame; 8-stud; 9-limit stop; 10-arc-shaped plate; 11-

bolt.

DETAILED DESCRIPTION OF EMBODIMENTS

As shown in Figs. 1-2, a construction formwork for arc-shaped overhanging eave of building comprises a bottom formwork, an end formwork 3 and a side formwork, and the side formwork and the end formwork 3 are commonly used formworks, which can be ordinary wood formwork or steel formwork, the bottom formwork is supported below the overhanging eave 1 through a scaffold to form the lower surface of the overhanging eave 1, and two ends of the bottom formwork are correspondingly provided with the end formwork 3 of the overhanging eave 1, the side formwork is located on an outer side of the overhanging eave 1, and two ends of the side formwork are correspondingly connected to an end surface to form the outer arc-shaped surface of the overhanging eave 1.

The side formwork comprises a flexible formwork 2, a support rod 4 and an U-shaped connection piece 5, the flexible formwork 2 can deform under external force to adapt to the arc-shaped outer surface with different curvatures, a plurality of support rods 4 are equidistantly distributed, and any adjacent two support rods 4 are connected through the U-shaped connection piece 5, two ends of the U-shaped connection piece 5 are fixed to the outer wall of the support rod 4. The U-shaped connection piece 5 can be a steel reinforcement with a diameter of 8-16 mm, which can deform the U-shaped connection piece 5 under external force and adjust the support rod 4, in response to the change of opening degree of the U-shaped connection piece 5 by external force, the curvature of the arc corresponding to the side formwork is changed accordingly, and the flexible formwork 2 is adhered closely to the inner side of the support rod 4 to form the outer arc-shaped surface of the overhanging eave 1.

The diameter of circular arc portion corresponding to the U-shaped connection piece 5 is adapted to the outer diameter of the support rod 4, so that the inner sides of support rod 4 and U-shaped connection piece 5 are on the same surface, so as to ensure the support capacity for flexible formwork 2, and there are no less than two U-shaped connection pieces 5 between any adjacent two support rods 4, the U-shaped connection piece 5 is a steel reinforcement with a deformable strength and can be deformed by manual bending, which can form a supporting structure corresponding to the flexible formwork 2 for support. The U-shaped connection piece 5 connects the support rod 4 as a whole, so as to make the supporting structure of flexible formwork more stable, the U-shaped

connection piece 5 can undergo multiple deformations to achieve the purpose of reuse.

Five to ten of the support rods 4 are grouped together, and adjacent two support rods 4 within the same group are connected through the U-shaped connection piece 5. The support rods 4 between adjacent groups is hinged in a detachable way, specifically, it can be hinged by hinges, which are
5 fixed with bolt 11 to support rod 4. This allows for modular splicing and transportation, so as to reduce the difficulty of construction.

Two ends of the U-shaped connection piece 5 are provided with an arc-shaped part which is extended along the outer wall of the support rod 4, the arc-shaped part increases the contact area with support rod 4, and the arc-shaped part is fixed to the outer wall of the support rod 4 by welding.

10 The flexible formwork 2 is fixed to the support rod 4 through the bolt 11 to ensure that the support rod 4 is tightly attached to the flexible formwork 2, the bolts 11 are provided at two ends of each support rod 4 corresponding to the flexible formwork 2, and a mounting hole is disposed on the support rod 4 to penetrate in the direction perpendicular to the flexible formwork 2, and the bolts 11 are connected to a nut after passing through the mounting hole, and the nut is tightened to fix the
15 flexible formwork 2 on the inner side of the support rod 4.

The screw hole corresponding to the bolt 11 is disposed on the flexible formwork 2 for the bolt 11 to connect to the support rod 4 after passing through the flexible formwork 2.

Or the bolt 11 is welded and fixed on the flexible formwork 2.

The support rod 4 is a hollow tube body, and the inner diameter of the mounting hole is greater
20 than the outer diameter of the bolt 11, which can provide bolt 11 with fine-tuning when adjusting different curvatures.

The flexible formwork 2 is cold rolled steel plate with a thickness of 1-3 mm. The flexible formworks 2 between adjacent two groups of the support rod 4 overlap with each other, with an overlap of no less than 5 cm.

25 The width of the flexible formwork 2 is consistent with the length of the support rod 4, and the flexible formworks 2 between adjacent two groups of the support rod 4 can be detachably fixed in the overlapping part by screws.

The construction formwork further comprises a locating rod 6, which is used to support the support rod 4 on the outside, so as to ensure that the side formwork will not deform during the
30 pouring process.

By setting up the scaffold as the load-bearing part to support the locating rod 6, specifically, the scaffold that is integrated with the lower part of the overhanging eave 1 is installed on the outer side of the overhanging eave 1, one end of the locating rod 6 is fixed on the scaffold which is corresponded to the outer side of the overhanging eave 1, and the other side of the locating rod 6 is contacted to the scaffold via an arc-shaped plate 10 and mounted on the outer side of the corresponding support rod 4, to locate the support rod 4 and avoid the instability of the support rod 4.

In order to install the locating rod 6 and make it correspond to the support rod 4, at least two horizontally distributed horizontal frames 7 are disposed on the scaffold, two horizontal frames 7 are respectively correspond to the upper edge and the lower edge of the side formwork, the horizontal frames 7 can be made by splicing the steel pipes of the scaffold and extending only along the horizontal plane where the upper edge and the lower edge of the side formwork are located, and the locating rod 6 is correspondingly connected to the horizontal frames 7.

Each horizontal frame is provided with the locating rod 6 corresponding to the support rod 4, which preferably extends vertically along the arc-shaped tangent line corresponding to the position of the support rod 4.

The main body of the locating rod 6 is the steel pipe of the scaffold. One end of the locating rod 6 is fixed to the horizontal frames 7 via a fastener, and the locating rod 6 points vertically towards the support rod 4, the other end of the locating rod 6 is slidably fitted with a stud 8 along the axial direction of the locating rod 6, which can expand and retract inside the locating rod 6, the stud 8 is fixedly connected to the arc-shaped plate 10, the external portion of the stud 8 is threadedly connected with a limit stop 9 that can stop the locating rod 6, the limit stop 9 adjusts the relative position through the thread to ensure the length of the locating rod 6 and tighten support rod 4.

The support rod 4 is a steel pipe with the diameter of 50-200 mm, and the diameter is adjusted according to the change rate of the corresponding arc-shaped surface.

Based on the above construction formwork, the construction method of the arc-shaped overhanging eave 1 comprises the following steps S1-S5,

in the step S1, firstly binding the reinforcement cage to the building and the part of the overhanging eave 1;

in the step S2, the scaffold is mounted, the scaffold is mounted to the lower surface of the part of

the overhanging eave 1 for supporting the bottom surface, and the bottom formwork of the overhanging eave 1 and the main part of the building are spliced with each other;

5 in the step S3, correspondingly placing the end formwork 3, breaking the U-shaped connection piece 5 according to the curvature of the outer arc-shaped surface of the overhanging eave 1 to adjust the curvature of the side formwork, and fixing the flexible formwork 2 and the support rod 4 via the bolt 11;

in the step S4, after the side formwork is placed at the corresponding position, the side formwork is supported outside the support rod 4 from outside to inside via the locating rod 6;

10 in the step S5, pouring the concrete, and pouring the cornice 1 and the building main body as one body.

A release agent is coated on the inner side of the flexible formwork 2.

Claims

1. A construction formwork for arc-shaped overhanging eave of building, characterized in that, the construction formwork for arc-shaped overhanging eave of building comprises a bottom formwork, an end formwork and a side formwork, the bottom formwork is supported below the overhanging eave through a scaffold, and two ends of the bottom formwork are correspondingly provided with the end formwork of the overhanging eave, the side formwork is located on an outer side of the overhanging eave, and two ends of the side formwork are correspondingly connected to an end surface;

the side formwork comprises a flexible formwork, a support rod and an U-shaped connection piece, wherein a plurality of support rods are equidistantly distributed, and any adjacent two support rods are connected through the U-shaped connection piece, in response to the change of opening degree of the U-shaped connection piece by external force, the curvature of the arc corresponding to the side formwork is changed accordingly, and the flexible formwork is adhered closely to an inner side of the support rod to form an outer arc-shaped surface of the overhanging eave.

2. The construction formwork for arc-shaped overhanging eave of building according to claim 1, characterized in that, the diameter of circular arc portion corresponding to the U-shaped connection piece is adapted to an outer diameter of the support rod, and there are no less than two U-shaped connection pieces between any adjacent two support rods.

3. The construction formwork for arc-shaped overhanging eave of building according to claim 2, characterized in that, two ends of the U-shaped connection piece are provided with arc-shaped parts which are extended along an outer wall of the support rod, and the arc-shaped parts are fixed to the outer wall of the support rod by welding.

4. The construction formwork for arc-shaped overhanging eave of building according to claim 1, characterized in that, bolts are provided at two ends of each support rod corresponding to the flexible formwork, and the support rod is provided with a mounting hole which is penetrated along a direction that is perpendicular to the flexible formwork, and the bolts are connected to a nut after correspondingly passing through the mounting hole.

5. The construction formwork for arc-shaped overhanging eave of building according to claim 4, characterized in that, the flexible formwork is cold rolled steel plate with a thickness of 1-3 mm.

6. The construction formwork for arc-shaped overhanging eave of building according to claim 1, characterized in that, the construction formwork further comprises a locating rod, one end of the locating rod is fixed on the scaffold which is corresponded to the outer side of the overhanging eave, and the other side of the locating rod is contacted to the scaffold via an arc-shaped plate and mounted on the outer side of the corresponding support rod.

7. The construction formwork for arc-shaped overhanging eave of building according to claim 6, characterized in that, at least two horizontally distributed horizontal frames are disposed on the scaffold, two horizontal frames are respectively correspond to an upper edge and a lower edge of the side formwork, and the locating rod is correspondingly connected to the horizontal frames.

8. The construction formwork for arc-shaped overhanging eave of building according to claim 7, characterized in that, one end of the locating rod is fixed to the horizontal frames via a fastener;

the other end of the locating rod is slidably fitted with a stud along an axial direction of the locating rod, the stud is fixedly connected to the arc-shaped plate, an external portion of the stud is threadedly connected with a limit stop that can stop the locating rod.

Ansprüche

1. Bauschalung für eine bogenförmige Traufe eines Gebäudes, dadurch gekennzeichnet, dass die Bauschalung eine Bodenschalung, Endschalungen und eine Seitenschalung umfasst, wobei die Bodenschalung unterhalb der Traufe durch ein Gerüst gestützt wird, wobei an den beiden Enden der Bodenschalung die Endschalungen der Traufe angeordnet sind, wobei die Seitenschalung an der Außenseite der Traufe angeordnet ist, wobei ihre beiden Enden mit der Endfläche verbunden sind; und
die Seitenschalung eine flexible Schalung, Stützstäbe und U-förmige Verbinder beinhaltet, wobei mehrere Stützstäbe gleichmäßig beabstandet verteilt sind, wobei zwei beliebige benachbarte Stützstäbe durch einen U-förmigen Verbinder verbunden sind, wobei die Öffnungsgröße des U-förmigen Verbinders durch äußere Kraft beeinflusst werden kann, wobei sich die Krümmung des Bogens der Seitenschalung entsprechend ändert, wobei die flexible Schalung eng an der Innenseite der Stützstäbe anliegt, um die äußere Bogenform der Traufe zu bilden.
2. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 1, dadurch gekennzeichnet, dass der Durchmesser des Bogenteils des U-förmigen Verbinders an den Außendurchmesser der Stützstäbe angepasst ist und die Anzahl des U-förmigen Verbinders zwischen zwei beliebigen benachbarten Stützstäben nicht kleiner als zwei ist.

3. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 2, dadurch gekennzeichnet, dass die beiden Enden des U-förmigen Verbinders bogenförmige Abschnitten bilden, die sich entlang der Außenwand der Stützstäbe erstrecken, wobei die bogenförmigen Abschnitte durch Schweißen an der Außenwand der Stützstäbe befestigt sind.
4. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 1, dadurch gekennzeichnet, dass die flexible Schalung an den beiden Enden entsprechend den Stützstäben mit Schrauben versehen ist, wobei die Stützstäbe jeweils mit einem Montageloch versehen sind, das vertikal zu der Richtung der flexiblen Schalung verläuft, und wobei die Schrauben durch die Montagelöcher hindurchgeführt und jeweils mit einer Mutter verbunden sind.
5. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 4, dadurch gekennzeichnet, dass die flexible Schalung eine kaltgewalzte Stahlplatte mit einer Dicke von 1-3 mm ist.
6. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 1, dadurch gekennzeichnet, dass die Bauschalung ferner eine Positionierungsstange umfasst, wobei ein Ende der Positionierungsstange an dem Gerüst außerhalb der Traufe befestigt ist und das andere Ende durch den Kontakt der Bogenplatte mit dem Gerüst an der Außenseite des Stützstabs montiert ist.

7. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 6, dadurch gekennzeichnet, dass auf dem Gerüst mindestens zwei horizontale Querrahmen vorgesehen sind und die beiden Querrahmen der Oberseite und der Unterseite der Seitenschalung entsprechen, wobei die Positionierstange mit den horizontalen Rahmen verbunden ist.

8. Bauschalung für eine bogenförmige Traufe eines Gebäudes nach Anspruch 7, dadurch gekennzeichnet, dass ein Ende der Positionierstange durch ein Befestigungselement an den Querrahmen fixiert ist; und
das andere Ende der Positionierstange entlang seiner Axialrichtung verschiebbar mit einer Schraube versehen ist, wobei die Schraube fest mit der Bogenplatte verbunden ist, und wobei das Außengewinde der Schraube mit einer Begrenzungsplatte verbunden ist, die die Positionierstange blockiert.

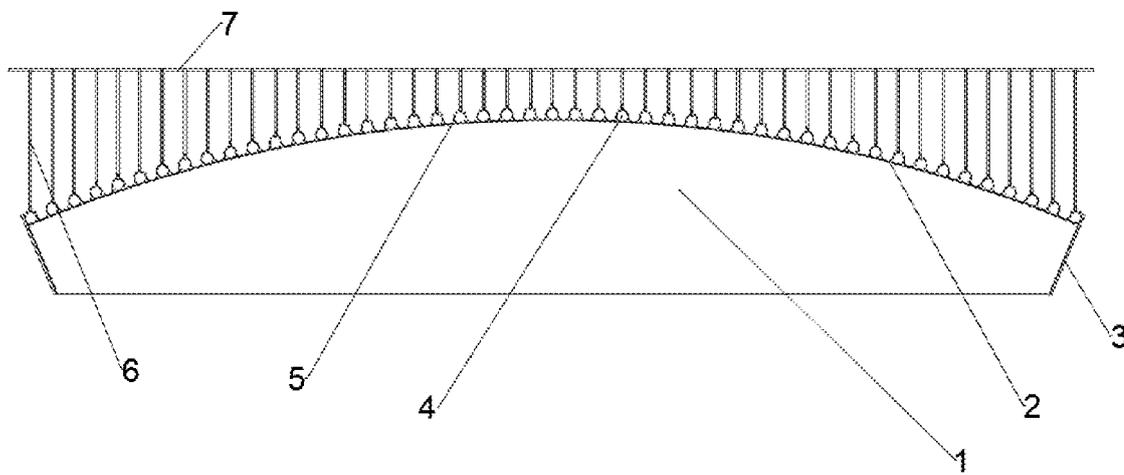


Fig. 1

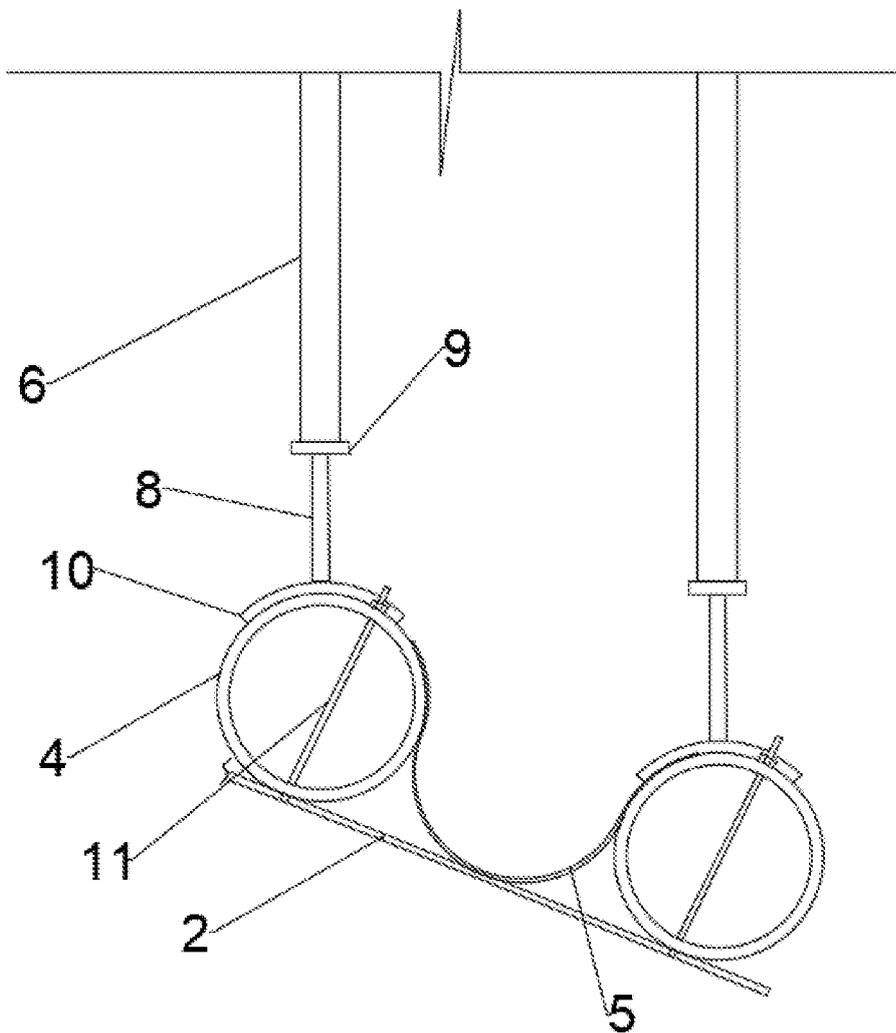


Fig. 2