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LIFTING METHOD FOR FORMWORK WORKING PLATFORM

Technical Field

The present invention relates to a lifting method
5 for a formwork working platform in that at a
construction site, the interval between a temporary work
stand and the building structure is easy and simple to
reduce when lifting a formwork working platform to a
desired height, thereby it is possible to gradually lift
10 the formwork working platform in a safe and simple
manner in the case of constructing a high-rise building
structure and assemble the formwork working platform in
a more stable state, more particularly to a lifting
method for a formwork working platform in that a rail
15 guide, which is transversely equipped with a ball screw,
is installed on the top of a rail connected to the
formwork working platform and a front rim of a guide
piece inserted into the rail guide is engaged with the
axis of the shoe adapter, so that the upper end portion
20 of the rail is exactly adjusted to be vertical and fixed
to a shoe adapter previously installed on a wall
according to a rotary motion of the ball screw, thereby
remarkably improving the workability thereof during
lifting of the formwork working platform in a high-rise
25 building and easily performing the installation thereof,
and a worker and a hydraulic pump are located at the



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lifting-completed formwork working platform and a cylinder is installed on a lifting formwork working platform via a hydraulic hose during lifting of the formwork working platform, so that it lifts the formwork
5 working platform by an operation on a remote controller, thereby preventing accidents owing to the lifting of the formwork working platform.

Background Art

10 Generally, in a lifting method for a formwork working platform, during constructing a high-rise building, each formwork working platform is fixed to a tower crane and so on to be moved upward. After the formwork working platforms are moved, each formwork
15 working platform is connected to each other, thereby placing and installing the concrete thereon.

However, where each formwork working platform is individually lifted and the formwork is installed thereon using the tower crane as described above, the
20 entire construction period becomes longer. Especially, in case of the high-rise building such as a high-rise apartment and so forth, when the formwork working platform is fixed thereto to be moved, the accidents can frequently happen owing to the rain or the wind. Also,
25 there is a defect in that it is very difficult to install the formwork working platform thereon.

Recently, in order to overcome the above problems, after the concrete is placed and installed therein, a shoe adapter is installed on a top of the placement surface of the formwork, a hydraulic pump is moved to
5 the lifting formwork working platform to be operated so that it is connected to a lower shoe adapter, a cylinder connected to the hydraulic pump is operated, thereby lifting the formwork working platform upward, an upper end portion of the rail of the lifting formwork working
10 platform is inserted into the upper shoe adapter to be fixed, the lifted formwork working platform is fixed and the cylinder is separated to be moved toward the next formwork working platform, and the hydraulic pump located at the first formwork working platform is
15 repeatedly moved to the next lifting formwork working platform, so that the plurality of formwork working platforms is lifted, thereby it is not influenced by the external environment during the lifting thereof. Also, the cylinder and the lifting device are separated from
20 each other, thereby effectively conducting the assembly and separation work of the formwork working platform. That is, it has been well-known in Korean Patent No. 10-0647977 as a lifting method of a formwork working platform equipped with removable cylinder and mobile
25 hydraulic pump.

In the lifting method of the formwork working

platform equipped with removable cylinder and mobile hydraulic pump, as shown in FIG. 1 through FIG. 3, a shoe adapter 10 is fixed to a nut 50, which is formed on the concrete wall, through a bolt; a rail 41, a working platform 42, a spindle 43, and a formwork 44 are integrally assembled in the shoe adapter 10 to be installed thereon by means of the crane and so on; and then, the hydraulic pump 60 is located at the working platform 42 to be operated. Accordingly, as shown in FIG. 2, the latch 21 of the cylinder pushes up the pins 41a, which are located at the center of the rail 41 and protrusion 12 formed at the lower shoe adapter 10 is adhered to the pin 41a to be slid down, thereby lifting the formwork working platform upward. When the lifting thereof is completed, the cylinder 20 is descended and the pin 41a of the descending rail is inserted into and coupled to the protrusion 12 formed at the lower shoe adapter 10, thereby blocking the descending of the rail 41 and maintaining the lifting height of the formwork working platform. Again, when the descending of the cylinder 20 is completed, the latch 21 of the cylinder 20 is again coupled to the pin 41a to be pushed up, thereby lifting the formwork working platform (a) upward.

As described above, in a state that the rail is coupled and fixed to the upper and lower shoe adapter,

the cylinder is separated from the shoe adapter. Thereafter, as shown in FIG. 3, the separated cylinder is moved toward the horizontally adjacent formwork working platform (b) and then, it is coupled to the shoe adapter of the formwork working platform (b) by the same manner, thereby lifting the formwork working platform. At this time, since the hydraulic pump is moved to the next lifting formwork working platform (c), the lifting formwork working platform can be easily lifted without the influence of the external environment.

However, in the conventional lifting method for the formwork working platform, when the lifting of the formwork working platform 42 connected to the rail 41 is completed by the operation of the cylinder 20, since it has a gap between the top portion of the rail 41 and the shoe adapter previously installed on the wall owing to a self-weight of the formwork working platform 42, there is a big defect in that the lifting thereof is completed in a slanted condition.

In this case, since it is impossible to insert the pin 41a of the rail into the protrusion 12 formed at the shoe adapter 10, the formwork working platform 42 is also slanted. Thus, the top portion of the rail is connected to the connecting means such as a loop and so forth and a plurality of workers pulls the top portion of the rail so as to adjust the location of the upper

end portion of the rail and then, the rail is fixed to the shoe adapter which is fixed to the upper portion thereof. However, there are problems in that the working property thereof is deteriorated and the install thereof is very difficult in the high-rise building during lifting thereof.

In addition, as shown in FIG. 3, during lifting of the last formwork working platform (c), since the worker is directly located at the lifting formwork working platform and the last formwork working platform is lifted by means of the cylinder and the hydraulic pump, there is a danger of a safety accident.

Disclosure

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Technical Problem

Therefore, the present invention has been made in view of the above-mentioned problems, and an object of the present invention is to provide a lifting method for a formwork working platform in that at a construction site, the interval between a temporary work stand and the building structure is easy and simple to reduce when lifting a formwork working platform to a desired height, thereby it is possible to gradually lift the formwork working platform in a safe and simple manner in the case of constructing a high-rise building structure and

assemble the formwork working platform in a more stable state and especially, a rail guide, which is transversely equipped with a ball screw, is installed on the top of a rail connected to the formwork working
5 platform and a front rim of a guide piece inserted into the rail guide is engaged with the coupling pin of the shoe adapter, so that the upper end portion of the slanted rail is exactly adjusted to be vertical and fixed to a shoe adapter previously installed on a wall
10 according to a rotary motion of the ball screw, thereby remarkably improving the workability thereof during lifting of the formwork working platform in a high-rise building and easily performing the installation thereof, and a worker and a hydraulic pump are located at the
15 lifting-completed formwork working platform and a cylinder is installed on a lifting formwork working platform via a hydraulic hose during lifting of the formwork working platform, so that it lifts the formwork working platform by an operation on a remote controller,
20 thereby preventing accidents owing to the lifting of the formwork working platform.

Technical solution

In accordance with the present invention to
25 achieve the object thereof, there is provided a lifting method for a formwork working platform, wherein after

the concrete is placed and installed therein, a formwork of a formwork working platform moves backward to be removed, shoe adapters are installed on a top of the placement surface of the formwork, a cylinder connected
5 to a hydraulic pump is installed on the shoe adapter located at a lower end portion of a lifting formwork working platform thereby lifting the formwork working platform upward, a top of a rail of the lifting formwork working platform is inserted into an upper shoe adapter
10 to be fixed, the lifted formwork working platform is fixed and the cylinder is separated, and then, the cylinder is moved toward the next formwork working platform to be installed, thereby repeatedly lifting the next lifting formwork working platforms upward,
15 comprising steps of: fixing a lower shoe adapter to an anchor bolt placed and installed on the concrete wall through a screw; inserting the cylinder connected to the hydraulic pump via a hydraulic hose between supporting frames of the lower shoe adapter; fixing a lower end
20 portion of the cylinder thereto through a coupling pin; supporting the formwork working platform connected to the rail thereon by hanging a latch transversely formed at a tilted guide channel, which is formed in the shoe adapter, on a locking unit of the rail to be fixed; and
25 again fixing an upper end portion of the cylinder to the coupling pin of the upper shoe adapter; hanging the

latch of the shoe adapter on the locking unit of the rail, thereby lifting the rail and the formwork working platform connected thereto, while the cylinder connected to the hydraulic pump and the hydraulic hose lifts the
5 formwork working platform by an operation on a remote controller through a worker located at the next lifting formwork working platform; installing a rail guide, which is transversely equipped with a ball screw, on an upper end portion of the rail connected to the formwork
10 working platform; and engaging a front rim of the rail guide with a coupling pin of the shoe adapter, thereby the upper end portion of the slanted rail is exactly adjusted to be vertical and fixed to a shoe adapter previously installed on the wall according to a rotary
15 motion of the ball screw, when the rail connected to the formwork working platform is fixed to the shoe adapter, which is previously installed on the top of the wall through the anchor bolt during the completion of the lifting of the formwork working platform; returning to
20 its original position through a descending of the cylinder; installing the cylinder on a second formwork working platform; and locating the worker and the hydraulic pump at the lifting-completed formwork working platform by interposing the hydraulic hose between them,
25 thereby lifting the second formwork working platform; and repeatedly installing the cylinder on other lifting

formwork working platform as above; and locating the worker and the hydraulic pump at the lifting-completed formwork working platform by interposing the hydraulic hose between them, thereby lifting other formwork
5 working platform.

Advantageous Effects

According to the lifting method for the formwork working platform, there are superior effects in that at
10 the construction site, the interval between the temporary work stand and the building structure is easy and simple to reduce when lifting the formwork working platform to a desired height, thereby it is possible to gradually lift the formwork working platform in a safe
15 and simple manner in the case of constructing the high-rise building structure and assemble the formwork working platform in a more stable state and especially, the rail guide, which is transversely equipped with the ball screw, is installed on the upper end portion of the
20 rail connected to the formwork working platform and the front rim of the guide piece inserted into the rail guide is engaged with the coupling pin of the shoe adapter, so that the upper end portion of the rail is exactly adjusted to be vertical and fixed to a shoe
25 adapter previously installed on the wall according to a rotary motion of the ball screw, thereby¹ remarkably

improving the workability thereof during lifting of the formwork working platform in a high-rise building and easily performing the installation thereof, and the worker and the hydraulic pump are located at the
5 lifting-completed formwork working platform and the cylinder is installed on the lifting formwork working platform via the hydraulic hose during lifting of the formwork working platform, so that it lifts the formwork working platform by an operation on the remote
10 controller, thereby preventing accidents owing to the lifting of the formwork working platform.

Brief Description of the Drawings

The foregoing and other objects, features and
15 advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a side structure view illustrating a
20 procedure of installing a shoe adapter on a placement surface of a concrete according to a conventional lifting method for a formwork working platform;

FIG. 2 is a side structure view illustrating a status of lifting a formwork working platform upward
25 through a cylinder according to a conventional lifting method for a formwork working platform;

FIG. 3 is a front structure view illustrating a lifting-completed status of a formwork working platform according to a conventional lifting method for a formwork working platform;

5 FIG. 4 is a schematic exploded view of a shoe adapter and a cylinder installed on a wall and a rail according to a lifting method for a formwork working platform of the present invention;

FIG. 5 is a perspective view illustrating a
10 coupling status of installing a shoe adapter on a rail according to a lifting method for a formwork working platform of the present invention;

FIG. 6 is a side sectional view illustrating a status of installing a shoe adapter and a cylinder on a
15 wall according to a lifting method for a formwork working platform of the present invention;

FIG. 7 is a side structure view illustrating a status of lifting a rail and a formwork working platform connected thereto according to a lifting method for a
20 formwork working platform of the present invention;

FIG. 8 is a side structure view illustrating a status of fixing a rail connected to a formwork working platform to a shoe adapter fixed to the upper portion of a wall according to a lifting method for a formwork
25 working platform of the present invention;

FIG. 9 is a side structure view illustrating a

status of completing the lifting of a formwork working platform according to a lifting method for a formwork working platform of the present invention;

FIG. 10 is a side structure view illustrating a status of vertically adjusting a slanted upper end portion of the rail connected to a formwork working platform through a rail guide according to a lifting method for a formwork working platform of the present invention;

FIG. 11 is an enlarged perspective view illustrating an important part of FIG. 10; and

FIG. 12 through FIG. 17 are schematic constructional views illustrating a lifting order according to a lifting method for a formwork working platform of the present invention.

<Descriptions on reference numbers for the major components in the drawings>

100: rail	110: shoe adapter
111: flange	120: locking unit
130: cylinder	140: anchor bolt
150: supporting frame	151: coupling pin
152: guide arm	153: guide channel
154: latch	160: hydraulic pump
161: hydraulic hose	170: ball screw
180: rail guide	190: guide piece
191: front rim	

a: formwork working platform

Best Mode

5 Mode for Invention

Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

FIG. 4 is a schematic exploded view of a shoe
10 adapter and a cylinder installed on a wall and a rail according to a lifting method for a formwork working platform of the present invention, FIG. 5 is a perspective view illustrating a coupling status of installing a shoe adapter on a rail according to a
15 lifting method for a formwork working platform of the present invention, and FIG. 6 is a side sectional view illustrating a status of installing a shoe adapter and a cylinder on a wall according to a lifting method for a formwork working platform of the present invention.

20 As shown in the drawings, it includes a rail 100 installed on and opposed to an outer wall of a concrete and equipped with a plurality of locking units 120 in a predetermined distance, upper and lower shoe adapters 110 for lifting formwork working platforms (a), and a
25 cylinder 130 for providing a lifting driving force to the shoe adapter 110 coupled between upper and lower

shoe adapters 110 so as to moving a temporary work stand upward.

Here, a pair of shoe adapters 110 is formed at the upper and lower parts of the cylinder 130. The lower
5 shoe adapter 110 is fixed to the outer wall of the concrete (C) through an anchor bolt 140.

Also, the upper and lower portions of the cylinder 130, which are inserted between a pair of supporting frames 150, are fixed to a pair of shoe adapters 110
10 through a coupling pin 151 of the shoe adapter 110.

At this time, a latch 154 is transversely formed at a tilted guide channel 153, which is formed in the shoe adapter 110, so that it hangs on the locking unit 120 of the rail to be fixed, while being guided along
15 the tilted guide channel 153.

Accordingly, in a state that the lower portion of the cylinder 130 is inserted between a pair of supporting frames 150, after it is fixed to the lower shoe adapter 110 through the coupling pin 151, a guide
20 arm 152 for closing or opening a flange 111 of the rail 100 is formed on the shoe adapter 110, thereby smoothly lifting the rail 100.

In addition, when the lifting of the rail 100 and the lifting of the formwork working platform connected
25 to the rail are completed, a rail guide 180, which is transversely equipped with a ball screw 170, is

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installed on the upper end portion of the rail connected to the formwork working platform and a front rim 191 of a guide piece 190 inserted into the rail guide 180 is engaged with the coupling pin 151 of the shoe adapter 5 110, so that the upper end portion of the slanted rail is exactly adjusted to be vertical and fixed to a shoe adapter previously installed on a wall according to a rotary motion of the ball screw 170.

The lifting method for the formwork working 10 platform according to the present invention having the above structure will be described in detail.

That is, after the curing of the concrete wall is completed, the anchor bolt 140 is placed and installed on the concrete wall so as to firstly lift the formwork 15 working platform. Thereafter, the formwork is moved from the concrete wall and the lower shoe adapter 110 is fixed to the anchor bolt 140 of the concrete wall through a screw.

The cylinder 130 is inserted between the 20 supporting frames 150 located at an upper portion of the lower shoe adapter 110, thereby fixing the lower end portion of the cylinder to the shoe adapter 110 through the coupling pin 151, it supports the formwork working platform (a) connected to the rail 100 thereon by 25 hanging the latch 154 transversely formed at a tilted guide channel 153, which is formed in the shoe adapter

110, on the locking unit 120 of the rail 100 to be fixed, and the upper end portion of the cylinder 130, which is connected to a hydraulic pump 160 and a hydraulic hose 161, is again fixed to the coupling pin 5 151 of the upper shoe adapter 110.

At this time, in a state that both guide arms 152 of the upper shoe adapter 110 is opened, it encloses the flange 111 of the rail 100 to be closed, thereby lifting it along the closed rail 100.

10 As shown in FIG. 7, it hangs the latch 154 of the shoe adapter 110 on the locking unit 120 of the rail 100, thereby lifting the rail 100 and the formwork working platform (a) connected thereto. At this time, the cylinder 130 connected to the hydraulic pump 160 and 15 the hydraulic hose 161 lifts the formwork working platform (a) by an operation on a remote controller.

Continuously, when the lifting of the formwork working platform (a) is completed, as shown in FIG. 8 and FIG. 9, the rail 100 connected to the formwork 20 working platform (a) is fixed to the shoe adapter 110, which is fixed to the top of the wall through the anchor bolt 140 and the coupling pin 151 is slipped and descended on the locking unit 120 of the rail 100 through the descending of the cylinder 130 to be 25 returned to its original position.

In the meantime, when the lifting of the rail 100

connected to the formwork working platform (a) is completed through the maximum ascending of the cylinder 130, as shown in FIG. 10 and FIG. 11, the rail guide 180, which is transversely equipped with the ball screw 5 170, is installed on the upper end portion of the rail connected to the formwork working platform and the front rim 191 of the guide piece 190 inserted into the rail guide 180 is engaged with the coupling pin 151 of the shoe adapter 110, so that the upper end portion of the 10 slanted rail is exactly adjusted to be vertical and fixed to a shoe adapter previously installed on the wall according to the rotary motion of the ball screw 170.

As described above, in a state that the rail 100 is coupled and fixed to the upper and lower shoe adapter 15 110, the cylinder, in that the descending is completed, is separated from the shoe adapter. Thereafter, the separated cylinder 130 is moved toward the horizontally adjacent formwork working platform and then, it is coupled to the shoe adapter 110 by the same manner, 20 thereby lifting the formwork working platforms.

In the meantime, FIG. 12 through FIG. 17 are schematic constructional views illustrating a lifting order according to a lifting method for a formwork working platform of the present invention.

25 As shown in the drawings, the cylinder 130 for providing the lifting driving force to the shoe adapter

100 is installed on the first formwork working platform (a). Thereafter, as shown in FIG. 12, the hydraulic pump 160 and the hydraulic hose 161 are installed on the first formwork working platform. Then, the worker is
5 horizontally located on the next formwork working platform and the first formwork working platform (a) is lifted by an operation on the remote controller with wire as described above.

Continuously, when the lifting of the first
10 formwork working platform is completed, as shown in FIG. 14, the cylinder 130 is installed on the second formwork working platform (a) and then, the worker and the hydraulic pump 160 are located at the lifting-completed first formwork working platform via the hydraulic hose
15 161, so that the second formwork working platform is lifted as shown in FIG. 15. Thereafter, similarly, the cylinder 130 is installed on the third formwork working platform (a) and then, the worker and the hydraulic pump 160 are located at the second lifting-completed formwork
20 working platform via the hydraulic hose 161, so that the third formwork working platform is lifted as shown in FIG. 16 and FIG. 17. Accordingly, the lifting work of the formwork working platform is simplified. Especially, since the work is not located at the lifting formwork
25 working platform, it can prevent accidents owing to the lifting of the formwork working platforms.

Although several exemplary embodiments of the present invention have been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are
5 possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Industrial Applicability

The present invention relates to a lifting method
10 for a formwork working platform in that a rail guide, which is transversely equipped with a ball screw, is installed on the top of a rail connected to the formwork working platform, so that the upper end portion of the rail is exactly adjusted to be vertical and fixed to a
15 shoe adapter previously installed on a wall according to a rotary motion of the ball screw, thereby remarkably improving the workability thereof during lifting of the formwork working platform in a high-rise building and preventing accidents owing to the lifting of the
20 formwork working platform.

Claims

1. A lifting method for a formwork working platform, wherein after the concrete is placed and installed therein, a formwork of a formwork working platform moves backward to be removed, shoe adapters are installed on a top of the placement surface of the formwork, a cylinder connected to a hydraulic pump is installed on the shoe adapter located at a lower end portion of a lifting formwork working platform thereby lifting the formwork working platform upward, a top of a rail of the lifting formwork working platform is inserted into an upper shoe adapter to be fixed, the lifted formwork working platform is fixed and the cylinder is separated, and then, the cylinder is moved toward the next formwork working platform to be installed, thereby repeatedly lifting the next lifting formwork working platforms upward, comprising steps of:

fixing the lower shoe adapter to an anchor bolt placed and installed on the concrete wall through a screw; inserting the cylinder connected to the hydraulic pump via a hydraulic hose between supporting frames of the shoe adapter; fixing a lower end portion of the cylinder thereto through a coupling pin; supporting the formwork working platform connected to the rail thereon by hanging a latch transversely formed at a tilted guide channel, which is formed in the shoe adapter, on a

locking unit of the rail to be fixed; and again fixing an upper end portion of the cylinder to the coupling pin of the upper shoe adapter;

hanging the latch of the shoe adapter on the
5 locking unit of the rail, thereby lifting the rail and the formwork working platform connected thereto, while the cylinder connected to the hydraulic pump and the hydraulic hose lifts the formwork working platform by an operation on a remote controller through a worker
10 located at the next lifting formwork working platform;

installing a rail guide, which is transversely equipped with a ball screw, on an upper end portion of the rail connected to the formwork working platform; and engaging a front rim of the rail guide with a coupling
15 pin of the shoe adapter, thereby the upper end portion of the slanted rail is exactly adjusted to be vertical and fixed to the shoe adapter previously installed on the wall according to a rotary motion of the ball screw, when the rail connected to the formwork working platform
20 is fixed to the shoe adapter, which is previously installed on the top of the wall through the anchor bolt during the completion of the lifting of the formwork working platform;

returning to its original position through a
25 descending of the cylinder; installing the cylinder on a second formwork working platform; and locating the

worker and the hydraulic pump at the lifting-completed formwork working platform by interposing the hydraulic hose between them, thereby lifting the second formwork working platform; and

5 repeatedly installing the cylinder on other lifting formwork working platform as above; and locating the worker and the hydraulic pump at the lifting-completed formwork working platform by interposing the hydraulic hose between them, thereby lifting other
10 formwork working platform.

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