DESCRIPTION

Title of Invention: UNIT ROOM, FLOOR PANEL, METHOD FOR TRANSPORTING THE SAME, AND METHOD FOR INSTALLING THE SAME

Technical Field

[0001]

The present invention relates to a unit room such as a bathroom, shower room, toilet room, or lavatory, a floor panel of the unit room, a method for transporting the unit room and the floor panel, and a method for installing the unit room and the floor panel.

Background Art

[0002]

As a method for transporting a unit room such as a bathroom, shower room, toilet room, or lavatory, PTL 1 discloses a method in which lifting fittings are attached to the floor member of a unit room in advance, the lifting fittings are connected to a lifting framework mounted on the unit room via a connecting member such as a chain, and the lifting framework is lifted by a crane to transport the unit room.

Citation List

Patent Literature

[0003]

PTL 1: JP-A-5-39675

Summary of Invention

Technical Problem

[0004]

In the above transportation method described in PTL 1, if the unit room slants or swings while the crane transports the unit room, the connecting member may make contact with the upper perimeter of the unit room, possibly damaging the unit room.

[0005]

Generally, a unit room is provided with level adjustment adjuster bolts used to perform level adjustment after being carried to the construction site.

[0006]

An object of the invention is to provide a unit room and a floor panel that are easy to transport and for which level adjustment can be performed easily after being installed in the installation site, a method for transporting the unit room and floor panel, and a method for installing the unit room and floor panel.

Solution to Problem

[0007]

In the floor panel according to the invention, bolts having retaining sections for retaining hanging members are provided at least at the corners or in the vicinity of the corners. These bolts are capable of screwing and moving in

a vertical direction and capable of screwing and moving to a position below the lower surface of the floor panel.

[0008]

The bolts are preferably eyebolts.

[0009]

The unit room according to the invention includes the floor panel, wall panels vertically standing on the floor panel, and a ceiling panel provided above the wall panels.

[0010]

A unit room transportation method according to the invention is a method for transporting this unit room and the method includes a step of mounting, on the unit room, a framework having holes extending in a vertical direction through which hanging linear bodies pass so that the framework surrounds an upper part of the periphery of the unit room, a step of retaining the lower ends of the linear bodies having passed through the holes to the retaining sections of the bolts, and a step of lifting and transporting the unit room via the linear bodies.

[0011]

The holes in the framework are preferably positioned above the bolts. In addition, the unit room is preferably transported by lifting it using a crane.

[0012]

A unit room installation method according to the

invention includes a step of lifting the unit room using the unit room transportation method, carrying the unit room above a planned installation portion, and placing the unit room in the planned installation portion, and a step of performing level adjustment of the unit room by turning the bolts.

[0013]

After the unit room is placed in the planned installation portion, the lower ends of the linear bodies are preferably removed from the retaining sections, and then level adjustment of the unit room is performed by turning the bolts.

[0014]

A floor panel installation method according to the invention is a method for carrying the unit room according to the present invention to the planned installation portion and installing the unit room and the method includes a step of retaining the hanging members to the retaining sections of the bolts, lifting the floor panels via the hanging members, carrying the floor panels to the planned installation portion, and placing the floor panels in the planned installation portion and a step of performing level adjustment of the floor panels by turning the bolts.

Advantageous Effects of Invention

[0015]

In the unit room and floor panel according to the invention, bolts with retaining sections are provided so as

to be capable of screwing and moving in a vertical direction. By retaining the lower ends of the hanging members to the retaining sections, the unit room or the floor panel can be lifted and transported via the hanging members.

[0016]

In transporting the unit room, the framework is mounted on the unit room so as to surround an upper part of the periphery of the unit room. The hanging members are passed through the holes, extending in a vertical direction, that are provided in the framework. Since the framework is mounted on the unit room and the hanging members are passed through the holes in the framework as described above, even if the unit room slants or swings when transported, the hanging members do not make contact with the unit room, thereby preventing the unit room from being damaged.

[0017]

After the unit room or the floor panel is carried to the planned installation portion and then placed in the planned installation portion, the level adjustment of the unit room or the floor panel is performed by turning the bolts. In the invention, the bolt functions as both a hanging fixture and a level adjustment member. Accordingly, the number of structural members of the unit room or the floor panel is small.

[0018]

After the unit room or the floor panel is placed in the

planned installation portion, the hanging members are first removed from the retaining sections and then the bolts are turned to perform level adjustment. This enables the bolts to be turned easily.

Brief Description of Drawings

[0019]

[Fig. 1] It is a perspective view showing a unit room according to an embodiment and a method for transporting the unit room.

[Fig. 2] It is a vertical cross-sectional view showing a method for installing the unit room.

[Fig. 3] It is a vertical cross-sectional view showing a method for the level adjustment of the unit room.

[Fig. 4] It is a perspective view showing a hanging framework.

[Fig. 5] It is a view showing the floor plan of the unit room.

[Fig. 6] It is a cross-sectional view showing cross-section VI-VI in Fig. 3.

[Fig. 7] It is a perspective view showing a floor panel.

Description of Embodiments

[0020]

An embodiment will be described with reference to Figs. 1 to 7.

[0021]

As shown in Fig. 7, a floor panel 1 includes a frame 2, a concrete slab 3, and tiles 4 affixed to an upper surface of the concrete slab 3.

[0022]

The frame 2 includes a frame-shaped frame body 2a and steel bars (not shown) arranged in a matrix in the frame body 2a. The frame body 2a is rectangular in plan view in the present embodiment. However, the shape may be a square or another shape. Although the frame body 2a is made of iron in the embodiment, the material is not limited to the embodiment. The concrete slab 3 is formed by placing concrete within the frame body 2a and the steel bars are embedded in the concrete slab 3. In placing concrete, a soil pipe 5 made of synthetic resin such as chloroethene and a drain grating 6 are disposed in advance so as to be integrated with the concrete slab 3.

[0023]

As shown in Figs. 2 and 3, an eyebolt 8 is provided at each of the four corners of the frame body 2a. Bolt insertion holes are provided in the upper surface of the frame body 2a and nuts 9 disposed concentrically with the bolt insertion holes are secured to the frame body 2a by welding. The eyebolts 8 are screwed into the nuts 9. Lock nuts 10 are screwed onto the eyebolts 8. Openings 11 through which the eyebolts 8 can pass are provided in portions on the bottom surface of the frame

body 2a that are located vertically below the eyebolts 8.

[0024]

As shown in Fig. 5, a unit room 20 includes wall panels 21, 22, 23, and 24 vertically standing at the perimeter of the floor panel 1 and a ceiling panel 25 (Fig. 1) covering the upper ends of the wall panels 21 to 24. An entry door 24a is provided in the wall panel 24.

[0025]

The unit room 20 is separated by a partition 26 into a shower space 27 and a toilet space 28. A toilet bowl 29 and a lavatory sink 30 are installed in the toilet space 28.

[0026]

In the embodiment, each of the wall panels 21 to 24 includes a frame 31, a ground board 32 attached to the front surface of the frame 31, and tiles 33 affixed to the front surface of the ground board 32, as shown in Fig. 6.

[0027]

At the corners of the unit room 20, there are corner posts 35 to couple the wall panels 21 and 22 adjacent to each other, the wall panels 22 and 23 adjacent to each other, and the wall panels 23 and 24 adjacent to each other, and the wall panels 24 and 21 adjacent to each other. The frame 31 of each of the wall panels 21 to 24 is secured to the corner post 35 with screws 36. The eyebolt 8 is disposed within the corner post 35. Accordingly, a special space for disposing the eyebolt 8 is

not necessary. The corner post 35 may be an L-angle.

[0028]

As shown in Fig. 4, a framework 40 used to transport the unit room 20 includes a rectangular framework body 41, a reinforcing bridge 42 for reinforcing the framework body 41, holes 43 provided at the four corners of the framework body 41 so as to pass through in a vertical direction, and guide pieces 44 projecting downward from the four corners of the framework body 41. The guide piece 44 is L-shaped in a horizontal cross-section so as to be arranged along the outer sides at the upper corners of the unit room 20. However, the guide piece 44 may be configured by a pipe such as a squared pipe.

[0029]

A linear body 46 such as a wire or chain passes through the hole 43. A hook 47 as a retaining member is attached to the lower end of linear body 46. In the embodiment, the upper ends of the four linear bodies 46 are tied together to a bundle. However, the linear bodies 46 and 46 disposed diagonally to the framework 40 may be one linear body.

[0030]

When the unit room 20 is transported, the framework 40 with the linear bodies 46 is mounted on the unit room 20 as shown in Fig. 1 so that the guide pieces 44 are arranged along the outer sides at the four corners of the unit room 20. The

hooks 47 at the lower ends of the linear body 46 are hooked into the eyebolts 8. Then, a hook 50 of the crane is hooked into the upper portion of the linear bodies 46 and the unit room 20 is lifted and transported. Since the framework 40 is mounted on the unit room 20 and the holes 43 are positioned vertically above the eyebolts 8, the linear bodies 46 are vertical between the floor panel 1 and the framework 40. Since the linear bodies 46 pass through the holes 43, if the unit room 20 slants or swings during transportation, the linear bodies 46 do not make contact with the unit room 20, thereby preventing the unit room 20 from being damage.

[0031]

After the unit room 20 is carried above the planned installation portion (a floor slab 60 in the embodiment), the unit room 20 is lowered slowly and placed on the floor slab 60. As shown in Fig. 2, adhesive or mortar 61 is preferably banked in advance at the planned touchdown positions of the bolts 8 on the floor slab 60.

[0032]

After the unit room 20 is placed on the floor slab 60, the hooks 47 are removed from the eyebolts 8, the framework 40 is lifted by the crane via the linear bodies 46, and the framework 40 is carried out of the planned installation portion. Next, the eyebolts 8 are turned so as to project downward from the openings 11 and abut against the upper surface of the floor

slab 60 as shown in Fig. 3. Then, the eyebolts 8 are further turned to perform the level adjustment of the unit room 20. In this way, the unit room 20 can be installed on the floor slab 60 and level adjustment can be performed.

[0033]

In order to improve the work efficiency of level adjustment of the unit room 20, horizontal base line is preferably marked on the back surfaces of the wall panels after the unit room 20 is assembled at a factory. After the unit room 20 is placed on the floor slab 60, horizontal level adjustment is performed so that the horizontal line marked in advance at the site is aligned with the horizontal base line above. A level vial (for example, a laser level vial) can be used to perform level adjustment instead of marking the horizontal line.

[0034]

In the above description, the unit room 20 is transported and installed. However, the framework 40 can also be mounted on the unit room 20 when the unit room 20 is carried out of the manufacturing factory to transport the unit room 20 as shown in Fig. 1.

[0035]

The framework 40 may be removed from the unit room 20 after the unit room 20 is carried out of the factory or may be left on the unit room 20 from the factory to the construction

site.

[0036]

Although the unit room 20 is transported and installed in the above description, it is also possible to transport only the floor panel 1, place it in a planned installation portion, perform level adjustment, and then build the wall panels on the floor panel 1 to construct the unit room. In this case, the hooks of the linear bodies 46 are hooked into the eyebolts 8 of the floor panel 1 and then the unit room is transported by lifting the linear bodies 46 using the crane. The method for adjusting the level of the floor panel 1 is the same as the procedure shown in Figs. 2 and 3. That is, after the floor panel 1 is placed on the floor slab 60, the hooks 47 are removed from the eyebolts 8 and then level adjustment is performed by turning the eyebolts 8.

[0037]

The above embodiment is an example of the invention and the invention may be achieved by an embodiment other than the shown one. For example, the floor panel 1 and the unit room 20 are for shower and toilet unit rooms in the above description, but they may be for other unit rooms such as a bath unit room.

Reference Signs List

[0038]

1: floor panel

2: frame

2a: frame body

3: concrete slab

4: tile

8: eyebolt

20: unit room

21 to 24: wall panel

25: ceiling panel

40: framework

41: framework body

43: hole

44: guide piece

46: linear body

47 and 50: hook

60: floor slab

CLAIMS

[Claim 1]

A floor panel provided with a bolt having a retaining section for retaining a hanging member at least at corners or in a vicinity of the corners,

wherein the bolt is capable of screwing and moving in a vertical direction and capable of screwing and moving to a position below a lower surface of a floor panel.

[Claim 2]

The floor panel according to claim 1,

wherein the bolt is an eyebolt.

[Claim 3]

A unit room comprising:

the floor panel according to claim 1 or 2;

a wall panel vertically standing on the floor panel; and

a ceiling panel provided above the wall panel.

[Claim 4]

A method for transporting the unit room according to claim 3, comprising the steps of:

mounting, on the unit room, a framework having a hole extending in a vertical direction through which a hanging linear body passes so that the framework surrounds an upper part of a periphery of the unit room;

retaining a lower end of the linear body having passed

through the hole to the retaining section of the bolt; and

lifting and transporting the unit room via the linear body.

[Claim 5]

The method for transporting the unit room according to claim 4,

wherein the hole in the framework is positioned above the bolt.

[Claim 6]

The method for transporting the unit room according to claim 4 or 5,

wherein the unit room is lifted and transported by a crane.

[Claim 7]

A method for installing the unit room, comprising the steps of:

lifting the unit room using the transporting method according to any one of claims 4 to 6, carrying the unit room above a planned installation portion, and placing the unit room in the planned installation portion; and

performing level adjustment of the unit room by turning the bolt.

[Claim 8]

The method for installing the unit room according to claim 7,

wherein, after the unit room is placed in the planned installation portion, a lower end of the linear body is removed from the retaining section and then level adjustment of the unit room is performed by turning the bolt.

[Claim 9]

A method for carrying and installing the floor panel according to claim 1 or 2 in a planned installation portion, the method comprising the steps of:

retaining the hanging member to the retaining section of the bolt, lifting the floor panel via the hanging member, carrying the floor panel above the planned installation portion, and placing the floor panel in the planned installation portion; and

performing level adjustment of the floor panel by turning the bolt.