

A LIGHT PARTITION WALL AND A METHOD FOR INSTALLING THE SAME

Field of the Invention

5

The present invention relates to the technical field of simple construction engineering, and in particular to a light partition wall and a method for installing the light partition wall.

Background of the Invention

10

A partition wall is a wall which serves for separation but not for load bearing. Due to the advantages of light weight and easy installment, light partition wall has been widely used in places, such as factories or restaurants, for installing individual
15 boxes or separating space. Traditionally, the light partition wall is manufactured as follows. First, a wall plate is produced. After the wall plate is delivered to the installment site, the wall plate is processed for conduit works, so that electrical wires can be embedded in conduits when the light partition wall is installed.

20 However, the above procedure is time-consuming and labor-consuming. In addition, when the wall plate is processed for conduit works, the light partition wall will be easily damaged, causing unnecessary wastes.

Summary of the Invention

25

The technical problem to be solved by the present invention is to provide a light partition wall, which is embedded with conduits and lamp boxes in advance, and a method for installing the light partition wall.

30 In order to solve the above technical problem, the present invention proposes a

light partition wall formed by jointing multiple partition plates, each partition plate including a covering layer, and a separating layer which is surrounded by the covering layer in a homogeneous manner. The partition plate further includes at least one conduit, and at least one lamp box, wherein the lamp box is fixed in the separating
5 layer and extrudes out of a surface of the partition plate, and the conduit passes through the separating layer and connects the lamp box with a top of the partition plate.

Specifically, the partition plate is further provided therein with passageways,
10 which are homogeneously distributed in the separating layer, and extend all over the partition plate along a vertical direction.

Preferably, at least one side surface of the partition plate is provided with a recess and/or a protrusion, the recess being matched with the protrusion.

15 Specifically, the partition plate is provided at an edge thereof with at least one positioning port, which is distributed along an edge of a side surface and/or a top surface of the partition plate in a homogeneous manner.

20 Preferably, in a region of the partition plate corresponding to an upper portion of the conduit there is provided with a filling groove, at a side of which a block plate is arranged.

Specifically, a wire mesh is arranged in the partition plate, and homogeneously
25 arranged inside the covering layer.

Specifically, the wire mesh includes transverse frames and longitudinal bars, wherein the transverse frames are distributed in the covering layer along a vertical direction, and the longitudinal bars are distributed homogeneously and fixed on
30 respective transverse frames.

Preferably, flywheels for fixing the wire mesh are further arranged in the partition plate.

- 5 Specifically, the covering layer is formed through stirring a mixture of cement, stone powder, water and fiber, coating the mixture homogeneously and solidifying the mixture. And the separating layer is formed from a mixture of ceramsite and fiber.

10 The present invention further proposes a method for installing the light partition wall, including the following steps:

 a cleaning step of cleaning a site to be installed with the light partition wall and wetting it by water;

15 a route planning step of marking ink lines on a surface of a wall at the site to be installed with the light partition wall, and indicating an installment outline on the ground at the site;

 a preliminary positioning step of nailing locating pins in the wall and a top panel according to the positions of the positioning ports;

20 a soft treating step of arranging rubber mats on a top portion of the partition plate to form a soft contact layer, wherein at least two rubber mats are provided for one partition plate;

25 an on-wall installing step of wetting a first partition plate by water at its periphery, filling sealant in the recess of the first partition plate, erecting the first partition plate with the recess facing the wall, pressing the first partition plate tightly on the surface of the wall at positions of the locating pins corresponding to the wall and the top panel, fixing the first partition plate by wooden wedges, and checking the first partition plate for horizontality with a spirit level;

30 an on-plate installing step of wetting a second partition plate by water at its periphery, filling sealant in the recess of the second partition plate, erecting the second partition plate with the recess being placed toward the protrusion of the first partition plate, so that the protrusion is pressed into the recess tightly, fixing the second

partition plate by wooden wedges at positions of the locating pins corresponding to the top panel, and checking the second partition plate for horizontality with the spirit level;

5 a finishing step of installing other partition plates according to the on-wall installing step or the on-plate installing step, thus completing the installment of the light partition wall;

a wiring step of arranging electrical wires in the conduits to complete wiring; and

a strengthening step of filling sealant in gaps formed between the installed partition walls, the regions where the locating pins are arranged, and the filling
10 grooves (9), coating white glue at the regions where the partition walls are connected with each other, and applying the fiber mesh thereto.

Compared with the prior arts, the present invention has the following technical effects. According to the light partition wall of the present invention, the partition
15 plate is produced through one single procedure of formation. Lamp boxes and conduits are embedded in the partition plate in advance, and then the partition plate is delivered to the site for installment. During said one single procedure of formation, conduits are embedded in the pre-fabricated floor plates, so that the on-site procedure for conduit works can be significantly reduced, since only the operations for
20 connecting the end ports of the conduits are necessary. In addition, with use of the conduits, the weight of the partition plate can be greatly reduced, so that the time and labor for installment can be saved, thus lowering the costs.

Brief Description of the Drawings

25

Fig. 1 schematically shows the structure of a light partition wall according to the present invention in a mounted state;

Fig. 2 schematically shows the structure of a partition plate according to the
30 present invention in a cross-sectional view;

Fig. 3 shows the arrangement of inner conduits, lamp boxes and passageways in the partition plate;

5 Fig. 4 schematically shows the structure of a wire mesh according to the present invention; and

Fig. 5 schematically shows the structure of two partition plates according to the present invention in a jointed state.

10

Detailed Description of the Embodiments

The present invention will be described in further detail with reference to the accompanying drawings.

15

Fig. 1 shows a light partition wall according to an embodiment of the present invention, which is formed by jointing multiple partition plates together. The partition plate is shown in Figs. 2 to 4, and includes a covering layer 1 and a separating layer 2, which is surrounded by the covering layer 1 in a homogeneous manner. The partition plate further includes at least one conduit 3, and at least one lamp box 4. The lamp box 4 is fixed in the separating layer 2, and extrudes out of a surface of the partition plate. The conduit 3 passes through the separating layer 2, and connects the lamp box 4 with a top of the partition plate. Unlike the traditional method for preparing the light partition wall, in which a flat partition plate is formed firstly, and then delivered to the installment site for conduit works, according to the present invention the conduit 3 and the lamp box 4 are embedded in the partition plate in advance. Electrical wire can be arranged in the conduit 3, so that the difficulties generated from installing the light partition wall can be lowered, and the late workload of wiring can be reduced. In addition, the plate can be directly mounted, so that the operation duration on site can be reduced and labor can be saved. Moreover, since the conduit 3 is embedded in the

20

25

30

wall body in advance, pollution can be reduced and the wall body is more pleasant in appearance.

Specifically, the partition plate is further provided with passageways 5. The
5 passageways 5 are homogeneously distributed in the separating layer 2, and extend all
over the partition plate along a vertical direction. The passageways 5 are mainly used
to reduce the weight of the partition plate, so as to achieve an easy installment. In
addition, the hollow passageways 5 may provide better effects in sound insulation and
fire resistance.

10 Preferably, side surfaces of the partition plate are provided with a recess 6 and/or
a protrusion 7, wherein the recess 6 matches with the protrusion 7 in shape. As shown
in Fig. 5, when two partition plates are jointed with each other, a firm connection
between said two partition plates is obtained from the engagement between the recess
15 6 and the protrusion 7. With the arrangement of the recess 6 and the protrusion 7, a
high fitness and a high flatness can be also obtained. Between the recess 6 and the
protrusion 7 is filled with sealant 15, which can be non-shrinking cement mortar as an
example. Moreover, when the side surface of the partition plate with the recess 6 is
applied to a wall surface or a roof, it can be adhered to the wall surface or the roof by
20 means of filling sealant 15 in the recess 6.

A fiber web 14 is further arranged on a region where the recess 6 engages with
the protrusion 7. With the arrangement of the fiber web 14, no cracks would be
formed in the mounted light partition wall due to mutual pulling. Thus the connection
25 between plates is strengthened.

Specifically, at least one positioning port 8 is provided at an edge of the partition
plate. In an embodiment, the positioning ports 8 are distributed along an edge of the
side surface and/or the top surface of the partition plate in a homogeneous manner.
30 The positioning port 8 is mainly used to connect the partition plate with the wall

surface or the roof more stably, thus ensuring sufficient strength for the light partition wall.

Preferably, in a region of the partition plate corresponding to an upper portion of the conduit 3 there is provided with a filling groove 9, at a side of which a block plate 10 is arranged. With the filling groove 9, it is convenient to insert electrical wires or other accessories into the conduit 3. After wiring, the filling groove 9 can be filled up with the sealant 15. The block plate 10 is mainly used to play a supporting role; otherwise, the filling groove 9 cannot be filled up with the sealant 15 due to lack of support. In this way, it is convenient for filling the sealant 15.

Specifically, a wire mesh is arranged in the partition plate. The wire mesh is homogenously arranged in the covering layer 1. Specifically, the wire mesh includes transverse frames 11 and longitudinal bars 12. The transverse frames 11 are distributed in the covering layer 1 along the vertical direction, and the longitudinal bars 12 are distributed homogenously and fixed on respective transverse frames 11. Preferably, flywheels 13 for fixing the wire mesh are further arranged in the partition plate. The wire mesh is distributed in a manner as shown in Fig. 4, and arranged on an inner surface of the covering layer 1. The flywheels 13 are fixed to the covering layer 1 and connected with the wire mesh, so as to ensure that the wire mesh is arranged exactly in the center of the partition plate. In this way, the pull force of the plate body is more homogenous.

Specifically, the covering layer 1 is formed as follows. First, cement, stone powder, water and fiber are mixed together. The mixture obtained is stirred, then homogeneously coated, and finally solidified to form the covering layer 1. The separating layer 2 is formed from a mixture of ceramsite and fiber. Concerning the mixture for forming the covering layer 1, conventionally-used sand is replaced with stone powder. In this manner, the cost and the pollution caused from the production can be both reduced, and the fire resistance can be improved. In addition, with fiber

being added in the mixture, the weight of the light partition wall can be largely reduced, and the crack generated from the shrinkage of the partition plate can be also lessened. Moreover, since the separating layer 2 is formed from a mixture of ceramsite and fiber, the fire resistance of the partition plate can be also improved, so
5 that the partition plate can have a better fire resistance.

The fiber used in the present invention is preferably polypropylene fiber, which can effectively control the crack generated from plastic shrinkage or air shrinkage of concrete or mortar, temperature change or the like, prevent and prohibit formation and
10 development of concrete primary fracture, significantly improve the anti-cracking performance, the anti-permeability, and the resistance to erosion and abrasion of the wall body, increase the toughness of the wall body, thus increasing the lifetime of the wall body. The fiber, treated by specialized destaticization and anti-UV treatment, is evenly distributed in the wall body, and can perform its function in a long term. In
15 addition, the fiber would not suffer any conflict or chemical reaction with concrete aggregate, admixture and cement, and has an excellent adaptability for use of the materials of the light partition wall. The fiber functions as follows. The cement will react with hydrate during hardening, causing volume shrinkage of the cement. Then, air shrinkage of the cement will be generated due to evaporation of free water. The
20 stress of these shrinkages will generate micro fractures in the cement when it is greater than the basic tensile strength of the cement. The fiber can render a disorder supporting system formed in the partition plate being dispersed rapidly, thus dispersing its directional stress. In this manner, the formation and development of primary fractures in the light partition wall can be prevented.

25

The present invention further proposes a method for installing the foresaid light partition wall, which includes the following steps.

In a cleaning step, the site to be installed with the light partition wall is cleaned,
30 and wetted by water.

In a route planning step, ink lines are indicated on the wall surface at the site to be installed with the light partition wall, and an installment outline is indicated on the ground at the site.

5

In a preliminary positioning step, locating pins are provided at the wall and the top panel according to the positions of the positioning ports 8.

In a soft treating step, rubber mats each with a size of 20mm*20mm*20mm are
10 nailed in a top portion of the partition plate by means of nails having a length of 60mm, thus forming a soft contact layer, wherein at least two rubber mats are nailed in one partition plate.

In an on-wall installing step, a first partition plate is wetted by water at its
15 periphery, and the sealant 15 is filled in the recess 6 of the first partition plate. Then, the first partition plate is erected, with the recess 6 facing the wall. The first partition plate is pressed tightly on the wall surface at positions of the locating pins corresponding to the wall and the top panel, and then the first partition plate is fixed by wooden wedges. Finally, the first partition plate is checked for horizontality with a
20 spirit level.

In an on-plate installing step, a second partition plate is wetted by water at its periphery, and the sealant 15 is filled in the recess 6 of the second partition plate. Then, the recess 6 of the second partition plate is placed toward the protrusion 7 of the first
25 partition plate, so that the protrusion 7 can be pressed into the recess 6 tightly. The second partition plate is fixed by wooden wedges at positions of the locating pins corresponding to the top panel. Finally, the second partition plate is checked for horizontality with a spirit level.

30 In a finishing step, other partition plates are installed according to the above

on-wall installing step or on-plate installing step, thus completing the installment of the light partition wall.

In a strengthening step, the sealant 15 is filled in gaps formed between the installed partition walls and the regions where the locating pins are arranged, and white glue is coated at the regions where the partition walls are connected with each other, and the fiber mesh 14 is applied thereto.

The foregoing description is merely illustrative of preferred embodiments of the present invention, and is not intended to limit the present invention. Various changes and modifications may be made by those skilled in the art. Any modifications, equivalent substitutions, improvements, and the like within the spirit and principles of the present invention are intended to be included within the scope of the present invention.

15

Part List

- 1 covering layer;
- 2 separating layer;
- 3 conduit;
- 20 4 lamp box;
- 5 passageway;
- 6 recess;
- 7 protrusion;
- 8 locating port;
- 25 9 filling groove;
- 10 block plate;
- 11 transverse frame;
- 12 longitudinal bar;
- 13 flywheel;
- 30 14 fiber mesh; and
- 15 sealant.

CLAIMS

1. A light partition wall formed by jointing multiple partition plates, each partition plate including a covering layer (1), and a separating layer (2) which is
5 surrounded by the covering layer (1) in a homogeneous manner,

characterized in that the partition plate further includes at least one conduit (3), and at least one lamp box (4), wherein the lamp box (4) is fixed in the separating layer (2) and extrudes out of a surface of the partition plate, and the conduit (3) passes through the separating layer (2) and connects the lamp box (4) with a top of the
10 partition plate, and

in a region of the partition plate corresponding to an upper portion of the conduit (3) there is provided with a filling groove (9), at a side of which a block plate (10) is arranged.

15 2. The light partition wall according to claim 1, characterized in that the partition plate is further provided therein with passageways (5), which are homogeneously distributed in the separating layer (2), and extend all over the partition plate along a vertical direction.

20 3. The light partition wall according to claim 2, characterized in that at least one side surface of the partition plate is provided with a recess (6) and/or a protrusion (7), the recess (6) being matched with the protrusion (7).

4. The light partition wall according to claim 2, characterized in that the partition
25 plate is provided at an edge thereof with at least one positioning port (8), which is distributed along an edge of a side surface and/or a top surface of the partition plate in a homogeneous manner.

5. The light partition wall according to claim 1, characterized in that a wire mesh
30 is arranged in the partition plate, and homogeneously arranged inside the covering

layer (1).

6. The light partition wall according to claim 5, characterized in that the wire mesh includes transverse frames (11) and longitudinal bars (12), wherein the
5 transverse frames (11) are distributed in the covering layer (1) along a vertical direction, and the longitudinal bars (12) are distributed homogeneously and fixed on respective transverse frames (11).

7. The light partition wall according to claim 6, characterized in that flywheels
10 (13) for fixing the wire mesh are further arranged in the partition plate.

8. The light partition wall according to any one of claims 1 to 7, characterized in that the covering layer (1) is formed through stirring a mixture of cement, stone powder, water and fiber, coating the mixture homogeneously and solidifying the
15 mixture, and the separating layer (2) is formed from a mixture of ceramsite and fiber.

9. A method for installing the light partition wall according to any one of claims 1 to 8, characterized in that the method includes the following steps:

a cleaning step of cleaning a site to be installed with the light partition wall and
20 wetting it by water;

a route planning step of marking ink lines on a surface of a wall at the site to be installed with the light partition wall, and indicating an installment outline on the ground at the site;

a preliminary positioning step of nailing locating pins in the wall and a top panel
25 according to the positions of the positioning ports (8);

a soft treating step of arranging rubber mats on a top portion of the partition plate to form a soft contact layer, wherein at least two rubber mats are provided for one partition plate;

an on-wall installing step of wetting a first partition plate by water at its
30 periphery, filling sealant (15) in the recess (6) of the first partition plate, erecting the

first partition plate with the recess (6) facing the wall, pressing the first partition plate tightly on the surface of the wall at positions of the locating pins corresponding to the wall and the top panel, fixing the first partition plate by wooden wedges, and checking the first partition plate for horizontality with a spirit level;

- 5 an on-plate installing step of wetting a second partition plate by water at its periphery, filling sealant (15) in the recess (6) of the second partition plate, erecting the second partition plate with the recess being placed toward the protrusion (7) of the first partition plate, so that the protrusion is pressed into the recess (6) tightly, fixing the second partition plate by wooden wedges at positions of the locating pins
10 corresponding to the top panel, and checking the second partition plate for horizontality with the spirit level;

 a finishing step of installing other partition plates according to the on-wall installing step or the on-plate installing step, thus completing the installment of the light partition wall;

- 15 a wiring step of arranging electrical wires in the conduits (3) to complete wiring; and

- a strengthening step of filling sealant (15) in gaps formed between the installed partition walls, the regions where the locating pins are arranged, and the filling grooves (9), coating white glue at the regions where the partition walls are connected
20 with each other, and applying the fiber mesh (14) thereto.