

PATENT SPECIFICATION

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(54) WALL PANEL FIXING APPARATUS

(71) We, YOSHIDA KOGYO K.K., a Japanese corporation, of No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a wall panel fixing apparatus for use in constructing a partition wall.

In most partitioning structures in offices and the like, wall panels are fitted in pillars having a special sectional profile, which are erected or supported between ceilings and floors.

In such conventional wall fixing apparatus, the sectional profile of the pillar is ordinarily complicated and the manufacture thereof is not easy. Further, a clamping member for use in attaching a wall panel to such pillar is exposed to the outer surface of the wall to interfere with the appearance of the resulting structure.

Recently, in order to attain a sound-insulating effect and a high decorative effect, large wall members composed of a sound-insulating material and not permitting a pillar or the like to be exposed to the surface are desired as wall panels. However, these requirements are not sufficiently satisfied by any of the conventional wall panel fixing apparatuses. Still further, the conventional wall panel fixing apparatuses are defective in that fixation of wall panels to pillars is a troublesome operation requiring much time and labor.

According to the invention there is provided a wall panel fixing apparatus comprising a pillar, a wall panel, a clamping member and a screw, said pillar including a plate-like portion, a panel-engaging flange formed on the plate-like portion to extend in the lateral direction thereof and a clamping member-fixing portion projecting from the central portion of the panel-engaging flange in the longitudinal direction of said plate-like portion and having a screw-receiving groove extending in the longitudinal direction thereof,

said wall panel having a groove formed on a side face thereof and being disposed along said panel-engaging flange, said clamping member being fitted in the groove of the wall panel, said screw extending through the clamping member into said screw-receiving groove, whereby a partition wall structure can be assembled.

The invention will be described by way of examples with reference to the accompanying drawings, wherein:—

Fig. 1 is a cross-sectional view, showing the main part of a partition wall structure assembled by using wall panel fixing apparatus embodying the present invention;

Fig. 2 is a perspective view, showing the main part of a pillar of an embodiment of the present invention;

Figs. 3 to 6 are perspective views, showing in modifications of a clamping member that is used in the structure of Fig. 1;

Fig. 7 is a plan view, diagrammatically showing a partitioned room; and

Fig. 8 is an enlarged view, illustrating a part VIII of Fig. 7.

Referring to the drawings, Fig. 1 in particular, a body 1 of a pillar in the wall panel attachment apparatus of Fig. 1 has a plate-like portion 2 of linear, T-shaped or cruciform section. Panel-engaging flanges 3 are formed perpendicularly to the plate-like portion 2 of the pillar body 1, and a clamping member-fixing portion 4 is formed on a front side extension line of the plate-like portion 2. Groove 5 for a hermetic sealing member is formed on the front face of each panel-receiving flange 3. The clamping member-fixing portion 4 consists of two ribs and a screw-receiving groove 6 is formed between these two ribs so that a screw for fixing a clamping member can be inserted into (i.e. received by) this groove 6. The width of the screw-receiving groove 6 is narrower than the major diameter of the screw but is substantially equal to the minor diameter of the screw. The pillar is prepared from aluminium or aluminium alloy by extrusion molding. Accordingly, when a screw is pressed and

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screwed into the groove 6, the screw is fixed as if the screw were screwed between female screw-threads formed on both sides of the groove 6.

5 A clamping member 7 may have various configurations shown in Figs. 3 to 6. In the example shown in Fig. 3, a hole 8 for a screw is formed in the interior of a strip-like metal plate, and in the example shown in Fig. 4, a pair of ribs 9, both sloping on the outside, are formed on one surface of the clamping member 7 and these ribs 9 are located on the sides of the groove 6 or on the end face of a wall panel 10 so as to prevent turning of the clamping member 7 a disengagement of the clamping member from a groove 11 formed in the wall panel 10. The groove 11 is formed in the central portion of the side face of the wall panel 10 so that the groove 11 extends in the lengthwise direction of the wall panel 10, and when a part of the clamping member 7 is inserted in this groove 11, the wall panel 10 is attached and fixed to the pillar 1. In Figs. 5 and 6, a single portion to be inserted into the groove 11 of a wall panel 10 is formed on one side only of the clamping member 7. In the example shown in Fig. 5, the thickness is increased toward the screw-receiving hole 8.

30 Fig. 7 is a plan view, showing a room which is divided into zones A, B, C and D by wall panels. The structure of the portion I in Fig. 7, which is illustrated in detail in Fig. 1 will now be described.

35 When a partition wall structure is constructed by utilizing the illustrated wall panel fixing apparatus, pillars 1a and 1b are first erected at predetermined positions as shown in Fig. 1, and wall panels 10 are disposed along the panel-engaging flanges of the pillars 1a and 1b. Then, a clamping member 7 is fitted in the groove 11 on the side face of the panel 10, near the top of panel 10, and a screw 12 is inserted into the hole 8 of the clamping member 7 and the screw 12 is screwed into the groove 6.

45 A hermetic sealing member is inserted in the groove 5 formed on the surface of each panel engaging flange 3, whereby good air tightness can be maintained between the wall panel 10 and the flange 3.

50 For fixation of the clamping member 7 by screwing the screw 12 into the groove 6 formed in the clamping member-fixing portion 4, in addition to the above-mentioned method, there may be adopted a method in which the clamping member 7 is fitted in the groove 11 in advance or a method in which the clamping member 7 is fitted in the longitudinal direction in the joint between two wall panels 10 and the clamping member 7 is turned and fitted in the groove 11.

In examples shown in Figs. 4 and 5, a wedge-shaped projection 9 is formed on the

clamping member 7, and this projection is fitted in the groove 11, whereby shaking of the attached wall panel 10 is effectively prevented.

When wall panels are constructed as shown in Fig. 1, a clearance is formed between the wall panels 10 at the clamping member-fixing portions 4. A joint filler 14 may be inserted in this clearance according to need.

When a wall panel 10' is attached perpendicularly to the wall panel 10, a long screw 12' is screwed into the groove 6 of the clamping member-fixing portion 4' of the pillar 1b to fix a pillar 1c thereto, and the wall panels 10 and 10' are fixed to the pillar 1c.

Fig. 7 illustrates the state where the room is partitioned by fixing wall panels in the above-mentioned manner. Inlet and exit frames 15 and the like may be fixed by utilizing clamping member-fixing portions between two adjacent wall panels 10.

Fig. 8 is an enlarged view, showing the part VIII in Fig. 7, and from Fig. 8, the state where partition walls α , β and γ are assembled by the illustrated wall panel fixing apparatus will readily be understood.

As will be apparent from the foregoing illustration, various partition walls can easily be assembled by utilizing the illustrated wall panel fixing apparatus.

In the illustrated wall panel fixing apparatus, the plate-like portion of the pillar is molded to have a T-shaped or cruciform section or a section of another shape, a panel-engaging flange is formed on the end portion of the plate-like portion rectangularly thereto, a projecting clamping member-fixing portion is formed on the front face of the panel-engaging flange, and a screw is screwed into a screw-groove formed in the clamping member-fixing portion to thereby fix a clamping member (or a pillar).

Since the clamping member-fixing portion is formed in the central portion of the panel-engaging flange and projects therefrom, the wall panel can be fixed precisely at a predetermined position. Further, since the wall panel is fixed to the pillar by means of the clamping member and screw, the assembling operation is remarkably easy. Especially, since a screw-receiving groove is formed in the clamping member-fixing portion to extend in the lengthwise direction thereof, the screw position may be set at any point in the lengthwise direction of the clamping member-fixing portion, namely in the lengthwise direction of the pillar. Still further, since a screw can be fixed merely by screwing it into the screw-receiving groove, the assembling operation can be completed in a short time at a high speed.

The depth of the clamping member-fixing portion 4 is smaller than the thickness of the wall panel, and the clamping member is

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fixed in the state tightly fitted in the groove formed in the central portion of the side wall of the wall panel. Accordingly, the clamping member and screw are not exposed to the surface of the wall panel and a beautiful wall face can be constructed by using wall panels of a large size. In addition, it is feasible to dispose an hermetic sealing member in a sealing member-receiving groove formed on the panel-engaging flange, and therefore a sound-insulating partition wall structure having good air tightness can be constructed.

Still in addition, since the pillar is prepared by extrusion molding of aluminium or aluminium alloy, it can be manufactured very easily without any trouble.

WHAT WE CLAIM IS:—

1. A wall panel fixing apparatus comprising a pillar, a wall panel, a clamping member and a screw, said pillar including a plate-like portion, a panel-engaging flange formed on the plate-like portion to extend in the lateral direction thereof and a clamping member-fixing portion projecting from the central portion of the panel-engaging flange in the longitudinal direction of said plate-like portion and having a screw-receiving groove

extending in the longitudinal direction thereof, said wall panel having a groove formed on a side face thereof and being disposed along said panel-engaging flange, said clamping member being fitted in the groove of the wall panel, said screw extending through the clamping member into said screw-receiving groove, whereby a partition wall structure can be assembled.

2. A wall panel fixing apparatus as claimed in claim 1, wherein said plate-like portion of the pillar is molded to have a linear T-shaped or cruciform section.

3. A wall panel fixing apparatus as claimed in claim 1 or 2, wherein a sealing member-receiving groove is formed on the surface of said panel-engaging flange and a sealing member is fitted in said groove.

4. A wall panel fixing apparatus as claimed in claim 1, wherein the screw-receiving groove in the clamping member-fixing portion has a width narrower than the major diameter of the screw and is formed in the central portion of the clamping member-fixing portion to extend in the longitudinal direction thereof.

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extending in the longitudinal direction thereof, said wall panel having a groove formed on a side face thereof and being disposed along said panel-engaging flange, said clamping member being fitted in the groove of the wall panel, said screw extending through the clamping member into said screw-receiving groove, whereby a partition wall structure can be assembled.

2. A wall panel fixing apparatus as claimed in claim 1, wherein said plate-like portion of the pillar is molded to have a linear T-shaped or cruciform section.

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