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"A CURTAIN WALL ASSEMBLY"

This invention relates to a curtain wall assembly. The invention is applicable for example to a unit type curtain wall in which the curtain wall units are mounted in the directions of top and bottom and left
5 and right to steel frames.

A unit type curtain wall is a wall having such a construction that the curtain wall units are successive-ly mounted to steel frames from a lower position of a building to an upper position thereof, and in its
10 execution the operation for connecting the upper curtain wall unit to the already mounted lower unit curtain wall unit is very cumbersome.

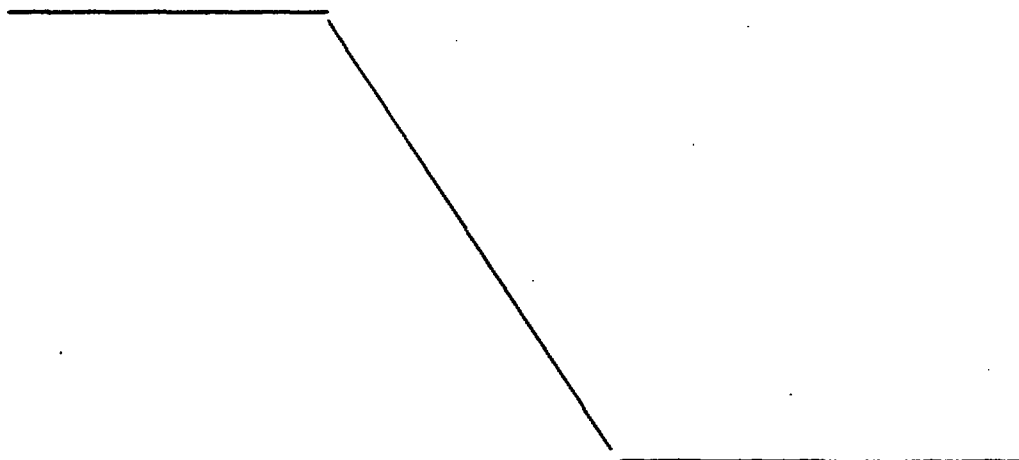
The present invention has been made in view of the above-described circumstances, and an aspect of the
15 invention is to provide an apparatus for connecting upper and lower curtain wall units in a unit type curtain wall in which the upper curtain wall unit may be simply and easily connected to the already mounted lower curtain wall unit.

20 According to the present invention there is provided a curtain wall assembly comprising a pair of upper and lower curtain wall units disposed in an upper and lower positional relation and a connecting device interconnecting said curtain wall units, wherein a
25 mounting portion integrally provided on a short side

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side wall of a lower horizontal frame member of the upper curtain wall unit and a horizontal batten thereof are fixed opposedly each other in a given spaced relation and wherein a mounting portion

5 integrally provided on a short side wall of an upper horizontal frame member of the lower curtain wall unit and a horizontal batten thereof are fixed opposedly each other in a given spaced relation, the connecting device comprising a connecting member
10 having an upper portion connected to said lower horizontal frame member and to said horizontal batten thereof and a lower portion connected to said upper horizontal frame member and said horizontal batten thereof.



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

Figure 1 is a front view showing a curtain wall;

5 Figure 2 is a sectional view taken on line II-II of Figure 1;

Figures 3 and 4 are sectional views, respectively, showing essential portions of another embodiment; and

10 Figure 5 is an explanatory view showing a modified form of the connecting member.

Figure 1 is a front view showing a curtain wall. Curtain wall units are mounted at top and bottom and to left and right to constitute a unit type curtain wall, a curtain wall unit Aa being
15 formed into a rectangular frame comprising a pair of vertical members 1a, 1b, an upper horizontal frame member 2a, second intermediate horizontal frame members $2m_1$, $2m_2$ and a lower horizontal member
20 2c.

The upper horizontal member 2c of the lower curtain wall unit Aa and the lower horizontal frame member 2c of the upper curtain wall unit Ac are connected as shown in Figure 2.

5 That is, the upper horizontal frame member 2a of the lower curtain wall unit Aa comprises a lengthy member in the form of a hollow lengthy member composed of both long side walls 10,11 and both short side walls 12,13. The short side wall 12 of a body 14 is formed
10 with a mounting piece 15, while another short side wall 13 being formed with a longitudinally continuous hollow portion 16 and a recess 17 open to the side of the long side wall 10. The mounting piece 15 has a Z-shaped side wall 15a formed with a first large mounting recess
15 18, an end wall 15b perpendicular to the Z-shaped side wall 15a being formed with second and third small mounting recesses 19,20 and formed with a shoulder 21 and another side wall 15c. This side wall 15c and the short side wall 12 of the body 14 forms a
20 shoulder 22, and the short end wall 12 is integrally formed with a pair of locking projections 23,24. A batten 61 is mounted by means of a screw 62 on the end wall 15b in the mounting piece 15 by the inter-
25 position of a connecting member 60 formed of a heat insulating material. The batten 61 has its outer side wall 61a integrally formed with a bended wall 61b bended into a hookshape to form

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5 a recess 63. The bended wall 61b is formed with fourth and fifth small recesses 64, 65 opposed to the second and third small mounting recesses 19, 20 of the mounting piece 15. The third small mounting recess 20 and the fifth small recess 64 has a connecting plate 66 formed of a heat insulating material fitted and mounted thereon.

10 Air tight materials 69, 69 are mounted between the pair of locking members 23, 24 and in a recess 68 formed in the outer side wall 61a of the batten 61, and a panel 34 is held and mounted between said air tight materials 69, 69.

15 The lower horizontal frame member 2c of the upper curtain wall unit Ac has the same shape as that of the upper horizontal frame member 2a of the lower curtain wall unit Aa, and they are mounted with the upper and lower portion inverted. The batten 61 is connected by means of the screw 62 by the interposition of the connecting member 60 and the connecting plate 66, and the panel 34 is held and mounted between the pair of air tight materials 69, 69.

20 A connecting member 50 which also serves as a flashing plate is connected over the upper horizontal frame member 2a and the lower horizontal frame member 2c.

25 The connecting member 50 is provided with upper and lower walls 52 and 53 and inner and outer walls 54 and 55, the upper wall 52 being inclined downward toward the outside, the inner wall 54 which is integrally formed at upper and lower portions thereof with upper and lower projections 56 and 57, the upper projection 56 being fitted and locked in the first large mounting recess 18 of the lower

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horizontal member 2c by the interposition of a downwardly directed C-shaped retaining member 51 having an elasticity, the lower projection 57 being fitted into the first large mounting recess 18 of the upper horizontal member 2a through an upwardly directed C-shaped retaining member 51, a hook 58 formed in the upper wall 52 engages and is locked at the fourth small recess 34, and a seal 80 mounted in a recessed groove 59 of a hanging piece 55a continuous to the outer wall 55 bears on the outer side wall 61a of the batten 61.

10 That is, the upper portion of the connecting member 50 is locked and secured on the side of the lower horizontal member 2c, and the lower portion thereof is displaceably mounted on the side of the upper horizontal member 2a.

15 It will be noted that the outer wall 55 of the connecting member 50 and the hanging piece 55a can be formed separately as shown in Fig. 5, in which case, a second hook 53a is projected at a corner between the outer wall 55 and the lower wall 53, a recess 53b is formed between the hook 53a and the lower wall 53, and the approximately downwardly directed L-shaped hanging piece 20 55a having the recessed groove 59 with the seal provided on the extremity thereof can be made to engage the recess 53b.

Thus, the lower curtain wall unit Aa has been mounted, and thereafter, the upper curtain wall unit Ac is assembled and the upper portion of the connecting member 50 is locked and fixed, 25 under the condition of which the upper curtain wall unit Ac is moved downward, the lower projection 57 of the connecting member 50 is fitted into the first large mounting recess 18 by the inter-

position of the retaining member 51, the seal 80 is brought into abutment with the outer side wall 61a, and the lower portion of the connecting member 50 is displaceably mounted on the side of the upper horizontal frame member 2a.

5 Accordingly, the upper curtain wall unit Ac may be simply and easily connected to the lower curtain wall unit Aa.

It will be noted that as shown in Fig. 3, the mounting piece 15 and the bended wall 61b can be formed with three mounting recesses 19, 20, 20a and recesses 64, 65, 65a, and the pair
10 of connecting plates 66, 66 can be fitted and mounted.

In this way, the connecting strength of the batten 61 to the body 14 increases.

It will be further noted that as shown in Fig. 4, the mounting recess 20a and the recess 65a can be formed above the mounting piece 15 and the connecting member 60 of the bended wall 61b,
15 and the connecting plate 66 can be fitted and mounted therein.

In this way, the connecting plate 66, 66 are positioned above and below the connecting member 60, and therefore, when assembled, the safety increases and the connecting strength of
20 the batten 61 increases.

Also, the upper portion of the connecting member 30 is locked at the lower horizontal frame member 2c and the batten 61, and the lower portion thereof bears on the outer side wall 61a of the batten 61 connected to the upper horizontal frame member
25 2a through the seal 80 to thereby prevent entry of rain water or the like from the outside.



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C L A I M S :

1. A curtain wall assembly comprising a pair of upper and lower curtain wall units disposed in an upper and lower positional relation and a connecting device interconnecting said curtain wall units, wherein a mounting portion integrally provided on a short side wall of a lower horizontal frame member of the upper curtain wall unit and a horizontal batten thereof are fixed opposedly each other in a given spaced relation and wherein a mounting portion integrally provided on a short side wall of an upper horizontal frame member of the lower curtain wall unit and a horizontal batten thereof are fixed opposedly each other in a given spaced relation, the connecting device comprising a connecting member having an upper portion connected to said lower horizontal frame member and to said horizontal batten thereof and a lower portion connected to said upper horizontal frame member and said horizontal batten thereof.

2. A curtain wall assembly according to claim 1 wherein said connecting member comprises an upper wall slightly inclined outwardly and downwardly, inner and outer walls extending substantially vertically downwardly from both edges internally and externally of said upper wall, a lower wall connected between the inner and outer



walls substantially in the intermediate portion between said inner and outer walls, a protruded hook formed substantially in the intermediate portion of said upper wall to engage the inner side of said horizontal batten of said horizontal member, and an upper protruded piece extending vertically upwardly from the inner edge of said upper wall and which is fitted through a resilient retainer into a downwardly directed mounting groove of the mounting portion of said upper curtain wall unit,

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10 characterized in that the lower end of said inner wall is vertically displaceably fitted into an upwardly directed mounting groove of the mounting portion of said lower curtain wall unit through a resilient retainer, and the lower end of said outer wall is connected to the outer wall surface of said horizontal batten of said lower

15 curtain wall unit through a seal through which air flows.

3. A curtain wall assembly according to claim 1 wherein the lower end of the outer wall of said connecting member is formed as a hanging piece separately from the outer wall and is mounted in a recessed groove

20 provided in the lower wall.

4. A curtain wall assembly substantially as described with reference to and as illustrated in Figures 1 and 2 of the accompanying drawings.

25 5. A curtain wall assembly substantially as described with reference to and as illustrated in Figures 1 and 2



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modified as in Figures 3 and 4 of the accompanying drawings.

6. A curtain wall assembly substantially as described with reference to and as illustrated in Figures 1 and 2
5 modified as in Figure 5 of the accompanying drawings.
