

CORNER STRUCTURE OF CURTAIN WALL

This invention relates to a corner structure of a curtain wall.

In a curtain wall, the heat insulation property of the curtain wall has an important influence on the air conditioning efficiency in the curtain wall. Even if the panel portions in the curtain wall exhibit sufficient heat insulation functions, if the corner portions or the like, other than the panel portions in the curtain wall have an insufficient heat insulation capacity, the overall heat insulation capacity in the curtain wall is inevitably reduced to a substantial extent.

For example, U.K. Patent Nos. 2102112 and 2023277 disclose a corner construction of a curtain wall in which a metal skeleton column is used as a corner member. However, as the corner construction of these U.K. Patents does not include a heat insulation structure between the indoor portion and the outdoor portion, the overall heat insulation capacity of the curtain wall is greatly reduced.

In addition to the problem of the heat insulation, easy installation and good external appearance of the corner structure are essential in the curtain wall. U.K. Patents Nos. 2102112 and 2023277 do not refer to these points at all.

According to the present invention there is provided a corner structure of a curtain wall comprising a pillar member including a hollow indoor section and an

arcuate outdoor section, a thermal insulating material disposed in a space defined between the indoor and outdoor sections, a tubular/cylindrical insulating spacer interposed between and abutting both of said indoor and outdoor sections through said insulating material, and a screw passed through said spacer and interconnecting said indoor and outdoor sections, said indoor and outdoor sections forming a panel holding groove at at least one side of the same, wherein said pillar member has a substantially sector-shaped cross-section.

It is believed possible by means of the present invention to provide a corner structure of the curtain wall which has a sufficient heat insulation capacity.

It is also believed possible by means of the present invention to provide a corner structure as aforementioned wherein the construction is easy for installation and the external appearance is pleasant.

In a preferred embodiment of the invention, since the indoor and outdoor sections are separated from each other by thermally insulating material interposed therebetween, the room where the curtain wall is installed can be effectively cooled and heated without affecting the thermally insulating system of the curtain wall. And since the indoor and outdoor sections of the pillar member can be easily and positively fastened together by the screw with the cylindrical spacer interposed between the indoor and outdoor sections, the sealing function of the panel members is not adversely affected. Furthermore, even if rain-water invades the corner structure through the screw hole in the panel, since the tightened cylindrical spacer abuts and is sealed

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at the opposite ends against the indoor and outdoor sections, the rainwater will not invade the insulation material and thus sufficient heat insulation can be maintained. Furthermore, since the outdoor section
5 presents the arcuate outer surface and only few screws are employed to fasten the indoor and outdoor sections together, the curtain wall has a pleasant external appearance and is easy for construction.

The present invention will be described by way of
10 examples with reference to the accompanying drawings in which:-

Fig. 1 is a perspective view of a corner structure embodying the present invention as seen from the outside of the room in which the corner structure is installed;

15 Fig. 2 is a cross-sectional view taken along the line II-II of Fig. 1; and

Fig. 3 is a cross-sectional view of a modified spacer.

Fig. 1 is a perspective view of a portion of a
20 curtain wall in which the corner structure embodying the invention is incorporated as seen from the outside of a room where the curtain wall is installed. The curtain wall comprises curtain wall units each including two vertical members (in this case one of which is a pillar member 1 and
25 the other is not shown) and a plurality of horizontal members 2 including upper, lower and intermediate horizontal members to provide a framework. The horizontal members 2

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extend from the opposite faces of the pillar member 1 at substantially right angles to each other. In order to provide the curtain wall with a heat insulation capacity, panels 3 such as double glazing panes or thermal insulation panels are fitted in the framework.

Fig. 2 shows the details of the pillar member 1 in cross-section taken along the line II-II of Fig. 1. The pillar member 1 includes a hollow, somewhat angular, indoor section 5 and an arcuate outdoor section 6 both of which can be formed by extruding aluminum, for example. These indoor and outdoor sections 5, 6 form the pillar member having a substantially sector-shaped cross-section as shown. In the illustrated embodiment, although the angle of the sector is shown as 90°, the angle of the sector may be varied if desired.

The panel members 3 are fitted and held in the grooves 12, 12 formed by opposing panel holders 13 and 14 at each side of the indoor and outdoor sections 5 and 6, respectively. In Fig. 2, reference numerals 4 denote compression members and reference numerals 11 denote gaskets interposed between the associated panel members 3 and indoor and outdoor sections 5, 6.

The outer surface of the outdoor section 6 itself forms the outer surface of the pillar member 1 and is formed arcuate as stated above. The outdoor section 6 is formed at the central area in the width thereof with a holed screw receiving area 15 whilst the indoor section

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5 is also formed with a holed screw receiving area 16 in the portion projecting outwardly from the rest of the indoor section opposite the screw receiving area 15. Thermal insulating material 10 such as glass wool is disposed in the space 17 defined between the indoor and outdoor sections 5, 6. A spacer 7 in the form of a tube and preferably a cylinder is passed through the insulating material 10 and is provided between and abutting both of the indoor and outdoor sections 5, 6.

10 The spacer is formed of material having sufficient rigidity, the ability to be firmly tightened and thermal insulation properties, such as synthetic resin. A screw 8 is threaded in through hole 9 formed in the spacer 7 and interconnects indoor and outdoor sections.

15 Fig. 3 shows a modified embodiment of the spacer 7 which has seal material 18 of high sealing properties attached to the opposite ends thereof to provide a positive seal between the screw receiving areas 15, 16.

The screw receiving area 15 of the outdoor section

20 6 is formed thicker than and contiguous to the rest of the section 6 so that the screw receiving area is effectively prevented from deforming and/or being damaged when subject to stress which will be applied to the area when the screw 8 is tightened.

Claims:

1. A corner structure of a curtain wall comprising a pillar member including a hollow indoor section and an arcuate outdoor section, a thermal insulating material disposed in a space defined between the indoor and outdoor sections, a tubular/cylindrical insulating spacer interposed between and abutting both of said indoor and outdoor sections through said insulating material, and a screw passed through said spacer and interconnecting said indoor and outdoor sections, said indoor and outdoor sections forming a panel holding groove at at least one side of the same, wherein said pillar member has a substantially sector-shaped cross-section.
2. A corner structure as claimed in claim 1, in which said outdoor section has a thickened screw receiving area.
3. A corner structure as claimed in Claim 1 or 2, in which said spacer is formed of synthetic resin.
4. The corner structure as claimed in Claim 1 or 2, in which said spacer has seal material on opposite ends thereof.

