

## Description

The present invention relates to a thermal insulating frame for casement window assemblies, door assemblies, and the like more particularly, the invention relates to a thermal insulating rectangular frame for a door or window, said frame comprising a pair of horizontal pieces and a pair vertical pieces, interconnecting said horizontal pieces, each of said horizontal and vertical pieces consisting of an interior member of thermal insulating rigid plastics and an exterior member of metal joined directly with said interior member.

There have been proposed a number of thermal insulating frames which comprise a pair of horizontal pieces and a pair of vertical pieces connected together and each consisting of a pair of spaced interior and exterior members. The interior and exterior members connected indirectly are liable to be displaced slightly with respect to one another, rendering the respective frame pieces and, in turn, the frame as a whole unstable in construction. Yet an increased number of components causes the assembling of the frame pieces of the frame to become complicated and tedious.

Specifications EP—A1—0 019 427, WO—A1—80/01820 and DE—A—2 045 156 each disclose a rectangular thermal insulating frame for a door or window, the frame comprising a pair of horizontal upper and lower pieces and a pair of vertical side pieces, the side pieces interconnecting the upper and lower pieces, each of the horizontal and vertical pieces consisting of an interior member of thermal insulating material joined directly to an exterior member of metal, the interior members of at least three of the pieces having identical cross-sectional shapes, portions of the interior and exterior members of the pieces being of substantially rectangular cross-sectional shapes. However, the rectangular cross-sectional portions of the interior members are not of substantially the same width as, and in substantially face-to-face abutment with, the rectangular cross-sectional portions of the corresponding exterior members; nor are the outer walls of the exterior members substantially flush with any parts of the outer walls of the interior members. Instead, their shapes are quite complicated.

According to the invention there is provided a thermal insulating rectangular frame (11) for a door or window, the frame (11) comprising a pair of horizontal upper and lower pieces (12, 13) and a pair of vertical side pieces (14, 15), the vertical pieces (14, 15) interconnecting the horizontal pieces (12, 13) each of said horizontal and vertical pieces (12—15) consisting of an interior member (19—22) of thermal insulating rigid plastics and an exterior member (23—26) of metal joined directly with said interior member: characterised in that said interior members (19, 21, 22) of three (12, 14, 15) of said pieces (12—15) have identical cross-sectional shapes; at least a portion of each said interior and exterior members (19, 21—23,

25, 26) of each said three pieces (12, 14, 15) being of substantially rectangular cross-sectional shape; in that said rectangular cross-sectional portion of each interior member (19, 21, 22) of each said three pieces (12, 14, 15) is of substantially the same width as, in substantially face-to-face abutment with, the rectangular cross-sectioned portion of its corresponding exterior member (23, 25, 26); and in that an outer wall (43, 68, 92) of the exterior member (23—26) of each said piece (12—15) includes an integral extension (47, 72, 97) extending in overlying relation to an inner portion of a stepped outer wall (32, 56, 82) of the corresponding interior member (19—22) whereby said outer wall (43, 47, 68, 92, 96) of the exterior member (23—26) is substantially flush with the outer portion of said stepped outer wall (32, 56, 82) of the interior member (19—22).

The invention will be further described by way of example with reference to the accompanying drawings in which a preferred embodiment of the present invention is shown by way of illustrative example. In the drawings:—

Figure 1 is a vertical cross-sectional view of a casement window assembly in which are used thermal insulating frames constructed in accordance with the present invention; and

Figure 2 is a horizontal cross-sectional view of the casement window assembly shown in Figure 1.

The principles of the present invention are particularly useful when embodied in thermal insulating frames for use in a casement window assembly such as shown in Figures 1 and 2, generally indicated by the numeral 10.

The casement window assembly 10 generally comprises an outer frame 11 including a pair of horizontal pieces 12, 13 (Figure 1) and a pair of vertical pieces 14, 15 (Figure 2) connecting the horizontal pieces 12, 13 to jointly define a rectangular window opening 16, a pair of fixed and pivoted window portions 17, 18 formed within the frame 11 to close the opening 16. Each of the horizontal and vertical pieces 12, 13 and 14, 15 consists of an interior member of thermal insulating material 19, 20, 21, 22 such as relatively rigid plastic material having excellent thermal insulating properties, and an exterior member 23, 24, 25, 26 of metal such as extended aluminium, steel or the like, the interior and exterior members 19—20, 23—26 being joined directly together.

A mullion 27 (Figure 2) extends vertically between the horizontal pieces 12, 13 of the frame 11 to define together with the frame 11 a pair of first and second frame portions 28, 29. A pair of spaced glass panes 30, 30 is mounted within the first frame portion 28 to form the fixed window portion 17. A double glazed casement 31 is pivotably mounted within the second frame portion 29 to form the pivoted window portion 18, the casement 31 being angularly movable in the counterclockwise direction to project outwardly of the window assembly 10 for selectively opening and closing the window opening 16 in cooperation with the fixed window portion 17.

and the drawings, the interior members 21, 22 of the pieces 14, 15 have a cross-sectional shape which is identical with that of the interior member 19 of the top rail 12.

The exterior member 25 or 26 of each of the pieces 14, 15 includes a hollow body of generally square cross section having an inner wall 91, an outer wall 92 and a pair of inner and outer sidewalls 93, 94 connecting the inner and outer walls 91, 92, the inner sidewall 93 being held in abutting engagement with the outer sidewall 84 of the interior member 21 (22). The inner wall 91 includes an integral extension 95 having at its distal end a locking protuberance 96 snugly received in the recess 86 in the inner wall 81 of the interior member 21 (22). The outer wall 92 also has an extension 97 formed integrally therewith and extending in overlying relation to the stepped outer wall 82 of the interior member 21 (22). The extension 97 has a pair of inwardly directed locking protuberances 98, 99 adjacent to its proximal and distal ends, respectively for abutting engagement with the recess 87 in and the stepped portion 85 of the outer wall 82 of the interior member 21 (22). A connection 100a or joint between the outer extension 97 and the stepped outer wall 82 is covered with the exterior siding 54. The weatherproofing material layer 133 covers the inner wall 81 of the respective inner member 21 (22), a portion of the inner wall 91 of the respective exterior member 25 (26) and another connection 100b between the inner walls 81, 91.

The double glazed casement 31 is pivotably mounted on one of the vertical pieces 14 of the frame 11 by means of hinges 101 (only one being shown in Figure 2) and comprises a pair of horizontal pieces 102, 103 (Figure 1) and a pair of vertical pieces 104, 105 (Figure 2) connecting the horizontal pieces 102, 103. Each of the pieces 102—105 consists of an interior member of thermal insulating plastic material 106, 107, 108, 109 and an exterior member 110, 111, 112, 113 of metal such as extruded aluminum, the interior and exterior members 106—109 and 110—113 being joined directly together.

Each interior member 106, 107 of the horizontal pieces or top and bottom rails 102, 103 includes a hollow body of generally rectangular cross section having an upper wall 114, a lower wall 115 and a pair of inner and outer sidewalls 116, 117 connecting the upper and lower walls 114, 115, the upper and lower walls 115, 116 having recesses 118, 119 adjacent to their respective outer ends or edges, respectively. The interior member 106 further includes an integral mounting flange 102 depending from the inner end or edge of the lower wall 115 for supporting glass panes together with a cooperating support 121 which is attached to the exterior member 110 of the top rail 102. The exterior member 110 includes a sidewall 122 and a pair of spaced upper and lower walls 123, 124 extending inwardly from the sidewall 122. The upper and lower walls 123, 124 have at their respective distal ends a pair of locking

protuberances 125, 126 directed toward each other and snugly received in the recesses 118, 119 in the interior upper and lower walls 114, 115, respectively. The upper wall 114, outer sidewall 117 and mounting flange 120 of the interior member 106 and a portion of the upper wall 123 of the exterior member 110 are coated with the weatherproofing material layer 133. For clarification, only the top rail 102 has been explained in structural details thereof by affixing reference numerals thereto.

As will become apparent from Figures 1 and 2, the interior members 108, 109 of the vertical pieces 104, 105 have a cross-sectional shape which is identical with that of the interior top and bottom rail members 106, 107 and therefore no description on structural details thereof is needed. The exterior members 111, 112, 113 of the bottom rail 103 and vertical pieces 104, 105 each have a structure generally similar to that of the exterior top rail member 110 described above, and structural details thereof can therefore be omitted.

The mullion 27 (Figure 2) consists of an inner member of thermal insulating material 127 such as thermal insulating rigid plastics and an exterior member of metal 128 such as extruded aluminum joined together by interlocking engagement of recesses 129, 130 in the former 127 with locking protuberances 131, 132 on the latter 128, respectively. A substantial part of the interior member 127 and a portion of the exterior member 128 are coated with the weatherproofing material layer 133.

As described hereinbelow, the respective interior members of thermal insulating plastic material 19—22; 106—109 and the respective exterior members of metal 23—26; 110—113 are joined directly together without connecting members interposed therebetween, with the result that the respective horizontal and vertical pieces 12—15; 102—105 and hence the frame 11 and the casement 31 have excellent thermal insulating properties and can be assembled easily with an increased degree of positional stability and firmness.

Furthermore, at least three interior members 18, 21, 22; 106, 108, 109 have an identical cross-sectional shape so that only two distinct interior members need to be manufactured for the respective pieces 12—15; 1—2—105 of the frame 11 or casement 31, reducing a number of components to a minimum and increasing a rate of production.

In this regard, it is noticed that a rate of extrusion molding of the plastic interior members is substantially smaller than a rate of extrusion of the metallic exterior members. If the frame or casement were assembled with pairs of horizontal and vertical pieces having four distinct cross-sectional shapes, such an imbalance in productivity would cause an over-production of the exterior members or a shortage of the interior members, resulting in reduction of the productivity of the frame as a whole. The interior members so

constructed in accordance with the invention as to have an identical cross-sectional shape can accommodate the imbalance in productivity between the interior and exterior members and hence avoid the foregoing problems.

The interior members 19—22; 106—109 have their respective surface areas coated with the layer of weatherproofing material 133 such as weatherable paint, weatherable plastics or the like, which the surface areas are exposed to the air as the window assembly 10 is mounted on the building wall.

The layer 133 makes the plastic interior members 19—22; 106—109 weatherproof against sun light irradiated thereto, and polluted liquid or gases which are liable to cause deterioration or change of properties of the plastic interior members 19—22; 106—109. The weatherproofing material layer 133 further extends over part of the exterior members 23—26; 110—113 beyond the connections or joints 53b, 80b, 100b between the respective interior and exterior 19—22; 106—109 and 23—26; 110—113, making the connections proof against rain, wind and other foreign material.

The connections or joints 53b, 80b, 100b between the respective extensions 47, 74, 97 and the respective stepped walls 32, 56, 82 are located closer to the building wall such an extent that they are covered with the exterior part 54 and hence made proof against rain, wind and other foreign material.

Each of the horizontal and vertical members 12—15; is assembled by first spreading the extensions 47, 50; 72, 74; 95, 97 of the respective exterior member 23—26 outwardly. The interior member 19—22 is then inserted between the extensions 47, 50; 72, 74; 95, 97 until its outer sidewall 35; 58; 84 is brought into abutting engagement with the inner sidewall 45; 70; 93 of the exterior member 23—26. With this condition, the extensions 47, 50; 72, 74; 95, 97 are pressed toward each other, bringing the locking protuberances 48, 49, 51; 37, 75, 76; 96, 98, 99 thereon into locking engagement with the recesses 37, 38; 60, 61; 86, 87 and the stepped portion 36; 56; 85 of the exterior member 19—22.

## Claims

1. A thermal insulating rectangular frame (11) for a door or window, the frame (11) comprising a pair of horizontal upper and lower pieces (12, 13) and a pair of vertical side pieces (14, 15), the vertical pieces (14, 15) interconnecting the horizontal pieces (12, 13) each of said horizontal and vertical pieces (12—15) consisting of an interior member (19—22) of thermal insulating rigid plastics and an exterior member (23—26) of metal joined directly with said interior member; characterised in that said interior members (19, 21, 22) of three (12, 14, 15) of said pieces (12—15) have identical cross-sectional shapes; at least a portion of each said interior and exterior members (19, 21—23, 25, 26) of each said three pieces (12, 14,

15) being of substantially rectangular cross-sectional shape; in that said rectangular cross-sectional portion of each interior member (19, 21, 22) of each of said three pieces (12, 14, 15) is of substantially the same width as, in substantially face-to-face abutment with, the rectangular cross-sectioned portion of its corresponding exterior member (23, 25, 26); and in that an outer wall (43, 68, 92) of the exterior member (23—26) of each said pieces (12—15) includes an integral extension (47, 72, 97) extending in overlying relation to an inner portion of a stepped outer wall (32, 56, 82) of the corresponding interior member (19—22) whereby said outer wall (43, 47, 68, 92, 97) of the exterior member (23—26) is substantially flush with the outer portion of said stepped outer wall (32, 56, 82) of the interior member (19—22).

2. A thermal insulating frame according to claim 1 characterised in that the integral extension (47, 72, 97) of the outer wall (43, 68, 92) of the exterior member (23—26) of each said piece (12—15) includes a pair of inwardly projecting locking protuberances (48, 49, 75, 76, 98, 99) adjacent to its proximal and distal ends, respectively, engaging a recess (37, 61, 87) in, and the stepped portion (36, 59, 85) of the outer wall (32, 56, 82) respectively of the interior member (19—22) of the piece (12—15).

3. A thermal insulating frame according to claim 1 or 2 characterised in that an inner wall (44, 68, 91) of each exterior member (23—26) includes an extension (50, 72, 95) having at its distal end a locking protuberance (51, 73, 96) engaging a recess (38, 60, 86) in an inner wall (33, 55, 81) of the corresponding interior member (19—22).

4. A thermal insulating frame according to any preceding claim characterised in that the interior member (19, 21, 22) of each of said three pieces (12, 15, 15) includes a pair of inner and outer mounting flanges (39, 40, 62, 88, 89),

5. A thermal insulating frame according to claim 4 characterised in that said mounting flanges (39, 40, 62, 63, 88, 89) are substantially coplanar.

6. A thermal insulating frame according to claim 5 characterised in that the interior member (20) of the fourth piece (13) includes an outer mounting flange (63) which is substantially coplanar with the mounting flanges (39, 40, 62, 63, 88, 89) of the other interior members (19, 21, 22) and has an inner mounting flange (62) of substantially L-shaped cross section (64, 65).

## Patentansprüche

1. Wärmeisolierender rechteckiger Rahmen (11) für eine Tür oder ein Fenster, bestehend aus einem oberen und einem unteren horizontalen Schenkel (12, 13) und zwei vertikalen seitlichen Schenkeln (14, 15), wobei die vertikalen Schenkel (14, 15) die horizontalen Schenkel (12, 13) miteinander verbinden und wobei die horizontalen und die vertikalen Schenkel (12—15) jeweils aus

constructed in accordance with the invention as to have an identical cross-sectional shape can accommodate the imbalance in productivity between the interior and exterior members and hence avoid the foregoing problems.

The interior members 19—22; 106—109 have their respective surface areas coated with the layer of weatherproofing material 133 such as weatherable paint, weatherable plastics or the like, which the surface areas are exposed to the air as the window assembly 10 is mounted on the building wall.

The layer 133 makes the plastic interior members 19—22; 106—109 weatherproof against sun light irradiated thereto, and polluted liquid or gases which are liable to cause deterioration or change of properties of the plastic interior members 19—22; 106—109. The weatherproofing material layer 133 further extends over part of the exterior members 23—26; 110—113 beyond the connections or joints 53b, 80b, 100b between the respective interior and exterior 19—22; 106—109 and 23—26; 110—113, making the connections proof against rain, wind and other foreign material.

The connections or joints 53b, 80b, 100b between the respective extensions 47, 74, 97 and the respective stepped walls 32, 56, 82 are located closer to the building wall such an extent that they are covered with the exterior part 54 and hence made proof against rain, wind and other foreign material.

Each of the horizontal and vertical members 12—15; is assembled by first spreading the extensions 47, 50; 72, 74; 95, 97 of the respective exterior member 23—26 outwardly. The interior member 19—22 is then inserted between the extensions 47, 50; 72, 74; 95, 97 until its outer sidewall 35; 58; 84 is brought into abutting engagement with the inner sidewall 45; 70; 93 of the exterior member 23—26. With this condition, the extensions 47, 50; 72, 74; 95, 97 are pressed toward each other, bringing the locking protuberances 48, 49, 51; 37, 75, 76; 96, 98, 99 thereon into locking engagement with the recesses 37, 38; 60, 61; 86, 87 and the stepped portion 36; 56; 85 of the exterior member 19—22.

#### Claims

1. A thermal insulating rectangular frame (11) for a door or window, the frame (11) comprising a pair of horizontal upper and lower pieces (12, 13) and a pair of vertical side pieces (14, 15), the vertical pieces (14, 15) interconnecting the horizontal pieces (12, 13) each of said horizontal and vertical pieces (12—15) consisting of an interior member (19—22) of thermal insulating rigid plastics and an exterior member (23—26) of metal joined directly with said interior member; characterised in that said interior members (19, 21, 22) of three (12, 14, 15) of said pieces (12—15) have identical cross-sectional shapes; at least a portion of each said interior and exterior members (19, 21—23, 25, 26) of each said three pieces (12, 14,

15) being of substantially rectangular cross-sectional shape; in that said rectangular cross-sectional portion of each interior member (19, 21, 22) of each of said three pieces (12, 14, 15) is of substantially the same width as, in substantially face-to-face abutment with, the rectangular cross-sectioned portion of its corresponding exterior member (23, 25, 26); and in that an outer wall (43, 68, 92) of the exterior member (23—26) of each said pieces (12—15) includes an integral extension (47, 72, 97) extending in overlying relation to an inner portion of a stepped outer wall (32, 56, 82) of the corresponding interior member (19—22) whereby said outer wall (43, 47, 68, 92, 97) of the exterior member (23—26) is substantially flush with the outer portion of said stepped outer wall (32, 56, 82) of the interior member (19—22).

2. A thermal insulating frame according to claim 1 characterised in that the integral extension (47, 72, 97) of the outer wall (43, 68, 92) of the exterior member (23—26) of each said piece (12—15) includes a pair of inwardly projecting locking protuberances (48, 49, 75, 76, 98, 99) adjacent to its proximal and distal ends, respectively, engaging a recess (37, 61, 87) in, and the stepped portion (36, 59, 85) of the outer wall (32, 56, 82) respectively of the interior member (19—22) of the piece (12—15).

3. A thermal insulating frame according to claim 1 or 2 characterised in that an inner wall (44, 68, 91) of each exterior member (23—26) includes an extension (50, 72, 95) having at its distal end a locking protuberance (51, 73, 96) engaging a recess (38, 60, 86) in an inner wall (33, 55, 81) of the corresponding interior member (19—22).

4. A thermal insulating frame according to any preceding claim characterised in that the interior member (19, 21, 22) of each of said three pieces (12, 15, 15) includes a pair of inner and outer mounting flanges (39, 40, 62, 88, 89),

5. A thermal insulating frame according to claim 4 characterised in that said mounting flanges (39, 40, 62, 63, 88, 89) are substantially coplanar.

6. A thermal insulating frame according to claim 5 characterised in that the interior member (20) of the fourth piece (13) includes an outer mounting flange (63) which is substantially coplanar with the mounting flanges (39, 40, 62, 63, 88, 89) of the other interior members (19, 21, 22) and has an inner mounting flange (62) of substantially L-shaped cross section (64, 65).

#### Patentansprüche

1. Wärmeisolierender rechteckiger Rahmen (11) für eine Tür oder ein Fenster, bestehend aus einem oberen und einem unteren horizontalen Schenkel (12, 13) und zwei vertikalen seitlichen Schenkeln (14, 15), wobei die vertikalen Schenkel (14, 15) die horizontalen Schenkel (12, 13) miteinander verbinden und wobei die horizontalen und die vertikalen Schenkel (12—15) jeweils aus



einem inneren Teil (19—22) aus einem wärmeisolierenden starren Kunststoff und aus einem äußeren Teil (23—26) bestehen, das mit dem inneren Teil unmittelbar verbunden ist, dadurch gekennzeichnet, daß die inneren Teile (19, 21, 22) von dreien (12, 14, 15) der Schenkel (12—15) identische Querschnitte haben, wobei mindestens ein Bereich eines jeden inneren und äußeren Teils (19, 21—23, 25, 26) eines jeden der drei Schenkel (12, 14, 15) einen im wesentlichen rechteckigen Querschnitt hat, daß der Bereich mit rechteckigem Querschnitt eines jeden inneren Teils (19, 21, 22) eines jeden der drei Schenkel (12, 14, 15) im wesentlichen die gleiche Breite aufweist als der im wesentlichen stirnseitig anliegende Bereich mit rechteckigem Querschnitt des zugehörigen äußeren Teils (23, 25, 26) und daß eine äußere Wand (43, 68, 92) des äußeren Teils (23—26) eines jeden Schenkels (12—15) eine einstückige Verlängerung (47, 72, 97) umfaßt, die einen inneren Bereich einer abgestuften äußeren Wand (32, 56, 82) des zugehörigen inneren Teils (19—22) überdeckt, wodurch die äußere Wand (43, 47, 68, 92, 97) des äußeren Teils (23—26) mit dem äußeren Bereich der abgestuften äußeren Wand (32, 56, 82) des inneren Teils (19—22) im wesentlichen fluchtet.

2. Wärmeisolierender Rahmen nach Anspruch 1, dadurch gekennzeichnet, daß die einstückigen Verlängerungen (47, 72, 97) der äußeren Wand (43, 68, 92) des äußeren Teils (23—26) eines jeden Schenkels (12—15) nahe ihren anliegenden bzw. abliegenden Enden nach innen ragende Verriegelungsvorsprünge (48, 49, 75, 76, 98, 99) aufweisen, die in eine Ausnehmung (37, 61, 87) bzw. den abgestuften Bereich (36, 59, 85) der äußeren Wand (32, 56, 82) des inneren Teils (19—22) des Schenkels (12—15) eingreifen.

3. Wärmeisolierender Rahmen nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß eine innere Wand (44, 68, 91) eines jeden äußeren Teils (23—26) eine Verlängerung (50, 72, 95) umfaßt, die an ihrem abliegenden Ende einen Verriegelungsvorsprung (51, 73, 96) aufweist, der in eine Ausnehmung (38, 60, 86) einer inneren Wand (33, 55, 81) des entsprechenden inneren Teils (19—22) eingreift.

4. Wärmeisolierender Rahmen nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das innere Teil (19, 21, 22) eines jeden der drei Schenkel (12, 14, 15) einen inneren und einen äußeren Befestigungsflansch (39, 40, 88, 89) aufweist.

5. Wärmeisolierender Rahmen nach Anspruch 4, dadurch gekennzeichnet, daß die Befestigungsflansche (39, 40, 88, 89) im wesentlichen bündig sind.

6. Wärmeisolierender Rahmen nach Anspruch 5, dadurch gekennzeichnet, daß das innere Teil (20) des vierten Schenkels (13) einen äußeren Befestigungsflansch (63) umfaßt, der mit den Befestigungsflanschen (39, 40, 88, 89) der übrigen inneren Teile (19, 21, 22) bündig ist, und einen inneren Befestigungsflansch (62) mit im wesentlichen L-förmigem Querschnitt (64, 65) aufweist.

## Revendications

1. Châssis rectangulaire thermiquement isolant (11) pour une porte ou une fenêtre, ce châssis (11) comprenant une paire de pièces supérieure et inférieure horizontales (12, 13) et une paire de pièces latérales verticales (14, 15), ces pièces verticales (14, 15) reliant mutuellement les pièces horizontales (12, 13), chacune desdites pièces horizontales et verticales (12—15) consistant en un élément intérieur (19—22) en matière plastique rigide thermiquement isolante et en un élément extérieur (23—26) de métal relié directement audit élément intérieur; caractérisé en ce que lesdits éléments intérieurs (19, 21, 22) de trois (12, 14, 15) desdites pièces (12—15) ont des formes de section droite identiques; au moins une partie de chacun desdits éléments intérieur et extérieur (19, 21—23, 25, 26) de chacune desdites trois pièces (12, 14, 15) ayant une forme de section droite sensiblement rectangulaire; en ce que ladite partie de section droite rectangulaire de chaque élément intérieur (19, 21, 22) de chacune desdites trois pièces (12, 14, 15) a sensiblement la même largeur que la partie de section droite rectangulaire de son élément extérieur correspondant (23, 25, 26) avec laquelle elle se trouve sensiblement face contre face; et en ce qu'une paroi extérieure (43, 68, 92) de l'élément extérieur (23—26) de chacune desdites pièces (12—15) comprend un prolongement (47, 72, 97) qui en fait partie intégrante et qui s'étend, en la recouvrant, sur une partie intérieure d'une paroi extérieure épaulée (32, 56, 82) de l'élément intérieur correspondant (19—22), ce qui fait que ladite paroi extérieure (43, 47, 68, 92, 97) de l'élément extérieur (23, 26) se trouve sensiblement de niveau avec la partie extérieure de ladite paroi extérieure épaulée (32, 56, 82) de l'élément intérieur (19—22).

2. Châssis thermiquement isolant selon la revendication 1, caractérisé en ce que le prolongement intégré (47, 72, 97) de la paroi extérieure (43, 68, 92) de l'élément extérieur (23—26) de chacune desdites pièces (12—15) comprend en un point adjacent à ses extrémités proximale et distale, respectivement, une paire de protubérances de blocage (48, 49, 75, 76, 98, 99) faisant saillie vers l'intérieur et s'engageant dans un évidement (37, 61, 87) dans la paroi extérieure (32, 56, 82) et dans la partie épaulée (36, 59, 85), respectivement, de l'élément intérieur (19—22) de la pièce (12—15).

3. Châssis thermiquement isolant selon la revendication 1 ou 2, caractérisé en ce qu'une paroi intérieure (44, 68, 91) de chaque élément extérieur (23—26) comprend un prolongement (50, 72, 95) comportant à son extrémité distale une protubérance de blocage (51, 73, 96) s'engageant dans un évidement (38, 60, 86) formé dans une paroi intérieure (33, 55, 81) de l'élément intérieur correspondant (19—22).

4. Châssis thermiquement isolant selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément intérieur (19, 21, 22) de chacune desdites trois pièces (12, 14, 15) comprend une paire d'ailes de montage intérieure



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et extérieure (39, 40, 62, 63, 88, 89).

5. Châssis thermiquement isolant selon la revendication 4, caractérisé en ce que lesdites ailes de montage (39, 40, 62, 88, 89) se trouvent sensiblement dans le même plan.

6. Châssis thermiquement isolant selon la revendication 5, caractérisé en ce que l'élément

intérieur (20) de la quatrième pièce (13) comprend une aile de montage extérieure (63) qui se trouve sensiblement dans le même plan que les ailes de montage (39, 40, 62, 63, 88, 89) des autres éléments intérieurs (19, 21, 22) et comporte une aile de montage (62) ayant une section droite (64, 65) sensiblement en forme de L.

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