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(54) **Coupler**

Koppler

Coupleur

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Description

[0001] The invention relates to a coupler suitable for coupling a two-part frame. More particularly the coupler is suitable for coupling a two-part frame that holds a piece of pane to an opening on a panel such as a door or a window.

BACKGROUND OF THE INVENTION

[0002] Figs. 2 and 3 show a two-part pane frame for mounting a piece of pane in an opening of a door or window. The pane is sandwiched between inner edges of the parts of the frame. The outer edges of the parts of the frame are mounted on respective sides of the edges of the opening on the door or window.

[0003] The pane frame has a number of conventional connectors distributed along the inner sides of the frame. Each of the connectors includes male and female connection parts. The male connector includes a plate with an enlarged free end for snap fastening into the slot of the female connector.

[0004] As the dimensions of the male and female connection parts are predetermined and they are irremovably connected to the respective parts of the pane frame. The distance between the two parts of the pane frame is confined by the dimensions of the male and female connection parts. As the parts of the frame are mounted on the respective sides of the edge of the opening of the door or window, the thickness of the edge of the opening and the thickness of the pane to be mounted are confined by the distance between the two parts of the pane frame, and hence the dimensions of the male and female connection parts.

[0005] One problem of this conventional connection parts is that they delimits the thickness of the edge of the opening of the door or window on which the pane frame is to be mounted and the thickness of the pane sandwiched between the parts of the frame.

[0006] The invention seeks to mitigate or at least alleviate such problem by providing an improved coupling.

[0007] One example from the prior art showing a frame with two frame members and a separate coupling member is document GB 2 440 245 A. This document discloses all the features of the preambles of claims 1 and 11.

SUMMARY OF THE INVENTION

[0008] According to the invention, there is provided a coupler for coupling together first and second frame members to form a frame which then holds a pane to an opening in a door or the like, the coupler comprising: a first coupling member operatively connected to the first frame member; a second coupling member operatively connected to the second frame member; and a connector having opposite first and second parts for connecting with the first and second coupling members respectively, the first part having a first fastener for bodily engagement

with the first coupling member and the second part having a second fastener for bodily engagement with the second coupling member; such that the first and second frame members are coupled together by the coupler, with the connector extending through said opening and connecting with the first and second coupling members, on opposite sides of said door or the like to thereby hold said pane in said opening.

[0009] Preferably, the first fastener and the first coupling member include corresponding engagement elements to effect bodily engagement between the first fastener and the first coupling member.

[0010] More preferably, the engagement elements include at least a first pair of inter-engageable formations for inter-engagement to prevent relative movement between the connector and the first coupling member in a first direction.

[0011] Yet more preferably, the first pair of inter-engageable formations includes two complementary profiled engagement surfaces co-operable to effect bodily engagement between the first fastener and the first coupling member.

[0012] It is preferable that the complementary profiled engagement surfaces include a protuberance and a recess for receiving the protuberance.

[0013] Advantageously, the engagement elements include a second pair of inter-engageable formations for inter-engagement to prevent relative movement between the connector and the first coupling member in a second direction perpendicular to the first direction.

[0014] It is advantageous that the second pair of inter-engageable formations include a groove and a rib for insertion into the groove to effect bodily engagement between the connector and the first coupling member.

[0015] More advantageously, the engagement elements include a second pair of inter-engageable formations for inter-engagement to prevent relative movement between the connector and the first coupling member in a second direction perpendicular to the first direction, the second pair of inter-engageable formations including a groove and a rib for insertion into the groove to effect bodily engagement between the connector and the first coupling member, wherein the groove and the recess face in respective directions perpendicular to one another for bodily engagement with the rib and the protuberance respectively to prevent relative movement between the connector and the first coupling member in mutually perpendicular first and second directions.

[0016] Yet more advantageously, the connector and the first coupling member additionally include complementary formations for bodily engagement against relative movement in a third direction perpendicular to the first and second directions.

[0017] Preferably, the second fastener and the second coupling member include inter-engageable members for bodily engagement in a first direction to prevent separation of the second fastener and the second coupling member in a direction parallel to the first direction.

[0018] More preferably, the second fastener includes an abutment for abutment relative to the second coupling member upon inter-engagement of the inter-engageable members, thereby fixing the relative position between the second fastener and the second coupling member in a direction parallel to the first direction.

[0019] Yet more preferably, the second fastener includes two said abutments which extend co-parallel but are of different lengths.

[0020] It is preferable that the second coupling member is associated with a void arranged to receive the or each abutment for engagement therewith to prevent relative movement between the connector and the second coupling member in at least one of two mutually perpendicular directions perpendicular to the first direction.

[0021] Advantageously, the void includes a recess arranged to receive the or each abutment for engagement therewith to prevent relative movement between the connector and the second coupling member in a second direction perpendicular to the first direction.

[0022] More advantageously, the void further includes a gap arranged to receive the or each abutment for engagement therewith to prevent relative movement between the connector and the second coupling member in a third direction perpendicular to the first and second directions.

[0023] Yet more advantageously, the first and second coupling members are integrally formed with the first and second frame parts respectively.

[0024] In another aspect of the invention, there is provided a coupler substantially as hereinbefore described with reference to the accompanying drawings.

[0025] In a further aspect of the invention, there is provided a method of coupling first and second frame members together to form a frame which holds a pane to an opening in a door or the like, comprising the steps of: providing a first coupling member operatively connected to the first frame member; providing a second coupling member operatively connected to the second frame member; and providing a connector having opposite first and second parts for connecting with the first and second coupling members respectively, the first part having a first fastener for bodily engagement with the first coupling member and the second part having a second fastener for bodily engagement with the second coupling member; such that the first and second frame members are coupled together, by the coupler, with the connector extending through said opening and connecting with the first and second coupling members, on opposite sides of said door or the like to hold said pane in said opening.

[0026] According to the invention the first fastener and the first coupling member include corresponding inter-engageable formations for bodily inter-engagement to prevent separation between the first fastener and the first coupling member, the first fastener being initially connected with the first coupling member through relative linear movement in a direction transverse to the connector.

[0027] Further according to the invention the second fastener and the second coupling member include inter-engageable formations for bodily engagement to prevent separation between the second fastener and the second coupling member, the second coupling member being subsequently connected with the second fastener through a linear movement of the second coupling member relative to the second fastener in a direction parallel to the connector.

[0028] Yet more preferably, the second coupling member is snap fitted with the second fastener.

BRIEF DESCRIPTION OF DRAWINGS

[0029] The invention will now be more particularly described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a front perspective view of a two-part pane frame mounted on an opening of a door or a window;

Figures 2 and 3 shows a conventional connector for connecting parts of the pane frame of Figure 1 together;

Figure 4 is a part perspective view of a two-part pane frame incorporated with a coupler in accordance with the invention, having a part of the frame and the coupler being cut away showing a cross-section of the couple;

Figure 5 is a partially exploded view of the two-part pane frame and the coupler of Figure 4;

Figure 6A is a perspective view of the coupler in Figures 4 and 5; and

Figure 6B is an exploded perspective view of the coupler in Figure 6A.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0030] Referring to Figure 1, there is shown a portion of a door 20 with a pane frame 10 embedded therein. The pane frame 10 is a two-part pane frame sandwiches a piece of pane 11. The two-part pane frame 10 includes first and second frame members 10A and 10B. As shown in Figure 4, inner edges 30A of respective members 10A and 10B cooperate with each other to sandwich between them a piece of pane 11. Outer edges 30B of respective members 10A and 10B cooperate with each other to mount onto the edges of the opening of the door 20.

[0031] Preferably, the frame 10 is generally rectangular in shape and the shape of the frame 10 corresponds to that of the opening on the door 20. In a different embodiment, the frame 10, hence the frame members 10A and 10B, may be of a square, circular, oval or any geo-

metric shape. The frame members 10A and 10B may be moulded from plastic or stamped from sheet metal.

[0032] An embodiment of coupler 100 is shown in Figures 4 to 6B. The coupler 100 couples together the first and second frame members 10A and 10B to form a frame 10 which then holds a pane 11 to an opening in a door 20 or the like. The coupler 100 has three main parts namely a first coupling member 101 operatively connected to the first frame member 10A, a second coupling member 102 operatively connected to the second frame member 10B; and a connector 103 which has opposite first and second parts for connecting with the first and second coupling members respectively. The first part has a first fastener 103A for bodily engagement with the first coupling member 101 and the second part has a second fastener 103B for bodily engagement with the second coupling member 102. The first and second frame members 10A and 10B are coupled together by the coupler 100, with the connector 103 extending through said opening and connecting with the first and second coupling members 101 and 102, on opposite sides of said door 20 or the like to thereby hold said pane 11 in said opening.

[0033] According to the invention the first fastener 103A and the first coupling member 101 include corresponding engagement elements to effect bodily engagement between the first fastener 103A and the first coupling member 101. The corresponding engagement elements includes first and second pairs of inter-engageable formations for inter-engagement to prevent relative movement between the connector 103/first fastener 103A and the first coupling member 101 in a first direction and a second direction substantially perpendicular to the first direction. The first pair of inter-engageable formations includes two complementary profiled engagement surfaces co-operable to effect bodily engagement between the first fastener 103A and the first coupling member 101. Preferably the first fastener 103A and the first coupling member 101 additionally include complementary formations for bodily engagement against relative movement in a third direction perpendicular to the first and second directions.

[0034] In more detail, the first coupling member 101 has one end integrally formed with the frame member 10A while the second coupling member 102 has one end integrally formed with the frame part 10B. The first and second coupling members 101 and 102 on the respective frame parts 10A and 10B extend towards one another and are provided at corresponding positions on the frame parts 10A and 10B respectively. In an alternative embodiment, the first and second coupling members 101 and 102 may be provided separate from the frame parts 10A and 10B and are connected to the frame parts 10A and 10B by conventional connectors.

[0035] The first coupling member 101 has a base 201 and protruberance 203 sandwiching a recess 202 together form part of the complementary profiled engagement surfaces of the first pair of formations. The first coupling member 101 also has a rib 204 extending from its free

end forming part of the second pair of formations. There is a slot 108 opening away from the free end forming part of the complementary formations. The first coupling member 102 is associated with a pair of recesses 106 and two pairs of detents 205 and 206 extending on either end of the recesses 106 to define a gap 106. The gap 106 and the recesses 106 are a void.

[0036] The second fastener 103B and the second coupling member 102 include inter-engageable members for bodily engagement in a first direction to prevent separation of the second fastener and the second coupling member in a direction parallel to the first direction. The second coupling member 102 has a base 301 and a protruberance 303 sandwiching a recess 302. The second coupling member 102 also has a rib 304 extending from its free end. There is a slot 108 opening away from the free end. In the preferred embodiment, the protruberance 303 of the second coupling member 102 forms part of the inter-engageable members of the second fastener 103B and the second coupling member 102. The second coupling member 102 is associated with a pair of recesses 107 and two pairs of detents 305 and 306 extending on either end of the recesses 107 to define a gap 107. The gap 107 and the recesses 107 are a void.

[0037] In the preferred embodiment, the first coupling member 101 is of a configuration substantially the same as that of the second coupling members 102.

[0038] The connector 103 is generally rectangular in shape with two opposite first and second parts or ends for connecting with the first and second coupling members 101 and 102 respectively. The first fastener 103A is provided adjacent the first part or end and the second fastener 103B is provide adjacent the second part or end.

[0039] Main body of the connector 103 is hollow. The main body comprises two abutment members 406 and 407 and a base 408. A partitioning wall 405 extends between the abutment members 406 and 407, which help to maintain the shape of the main body.

[0040] In the preferred embodiment, the first and second fasteners 103A and 103B are structurally different making them distinguishable from one another. The first fastener 103A includes a plate 401 extending from one of the coupling end and a protruberance 402 extending perpendicular to the plate 401 at or adjacent its free end. A space in the form of a recess 403 is defined between the protruberance 402 and end 409 of the base 408. These features together define another part of the complementary profiled engagement surfaces of the first pair of formations for preventing relative movement between the connector 103 and the first coupling member 101 in the first direction. Also there is a groove 404 opening into and extending along length of the end 409. The groove 404 form another part of the second pair of formations for preventing relative movement between the connector 103 and the first coupling member 101 in the second direction. Furthermore, there is a knob 410 extending from and at about midlength of the end 409, adjacent the groove 404. This knob 410 defines another part of the

complementary formations.

[0041] In summary, the base 201, the protuberance 203 and the recess 202 of the first coupling member 101 and the protuberance 402, the recess 403 and the end 409 of the first fastener 103A together define the first pair of formations. The groove 404 and the rib 204 for insertion into the groove define the second pair of formations. The groove 404 and the recesses 202 and 403 face in respective directions substantially perpendicular to one another for bodily engagement with the rib 204 and the relevant protuberance 203 and 402 respectively to prevent relative movement between the first coupling member and the connector in mutually perpendicular first and second directions. The slot 108 and the knob 410 for insertion into the slot 108 define the complementary formations.

[0042] These features together prevent relative movement between the connector 103 and the first coupling member 101 in the direction along three axis X, Y and Z.

[0043] The second fastener 103B includes the two abutments 406 and 407 for abutment relative to the second coupling member 102 upon inter-engagement of the inter-engageable members, thereby fixing the relative position between the connector 103 and the second coupling member 102. In the preferred embodiment, the abutments 406 and 407 extend co-parallel but are of different lengths. The abutments 406 and 407 each have a retainer 406A and 407A extending therefrom. These retainers 406A and 407A extend generally and preferably substantially perpendicular to length of the abutments 406 and 407. The retainers 406A and 407A are rested on one side of the pane 11 and one side of the edge of the door 20 respectively. The different lengths of the abutments 406 and 407 allow accommodation of the pane 11 and the edge of the door 20 which are of different thickness. The retainers 406A and 407A include a detent 411 and 412 respectively for assisting detention of the pane 11 or the edge of the door 20.

[0044] The protuberance 407B and the protuberance 303 together form the inter-engageable members between the second fastener 103B and the second coupling member 102, for bodily engagement to prevent separation of the second fastener 103B and the second coupling member 102. The protuberance 407B has a slanted upper wall that permits the protuberance 303 to slide pass the protuberance 407B. Lower wall of the protuberance 407B and upper wall of the protuberance 303 abut one another to prevent separation of the second fastener 103B and the second coupling member 102 in the direction along axis Y. The partition wall 405 maintain position of the protuberance 303 adjacent the protuberance 407B.

[0045] As shown in Figures 6A and 6B, there is provided a method of coupling first and second frame members 101 and 102 together to form a frame 10 which holds a pane 11 to an opening in a door 20 or the like, comprising the steps of, providing a first coupling member 101 operatively connected to the first frame member 10A, providing a second coupling member 102 operatively connected to the second frame member 10B; and pro-

viding a connector 103 having opposite first and second parts for connecting with the first and second coupling members 101 and 102 respectively, the first part having a first fastener 103A for bodily engagement with the first coupling member 101 and the second part having a second fastener 103B for bodily engagement with the second coupling member 102; such that the first and second frame members 10A and 10B are coupled together, by the coupler 100, with the connector 103 extending through said opening and connecting with the first and second coupling members 101 and 102, on opposite sides of said door 20 or the like to hold said pane 11 in said opening.

[0046] When assembling/coupling the first coupling member 101 and the connector 103, the first fastener 103A is initially connected with the first coupling member 101 through relative linear movement in a direction transverse to the connector 103. The protuberances 203, 204 are inserted into the recess 403 and groove 404, the protuberance 402 is inserted into the recess 202 by moving the connector 103 linearly and relative to the first coupling member 101 in a direction parallel to an imaginary plane A of the frame 10. The moving of the connector 103 relative to the first coupling member 101 will bring the knob 410 towards the slot 108. The tongue 410 aligns with and retained in the detent 100 once the protuberances 203, 204 are fully inserted into the recess 403 and groove 404.

[0047] The protuberance 402 of the connector 103 is inserted into the recess 202 and the recess 403 accommodates the protuberance 203. The rib 204 of the first coupling member 101 is inserted into the groove 404. The knob 410 is retained in the slot 108.

[0048] The protuberance 402, recess 403, recess 202 and protuberance 203 together prevent relative movement of between the first coupling member 101 and the connector 103 in the direction along axis Y. The groove 404 and the rib 204 prevent relative movement between the first coupling member 101 and the connector 103 in the direction along axis Z. The knob 410 and the slot 108 prevent relative movement between the first coupling member 101 and the connector in the direction along axis X.

[0049] When assembling/coupling the second coupling member 102 to the connector 103, the second coupling member 102 being subsequently connected with the second fastener 103B through a linear movement of the second coupling member 102 relative to the second fastener 103B in a direction parallel to the connector 103. The second coupling member 102 is moved towards the second fastener 103B linearly in a direction perpendicular to the imaginary plane A of the frame 10. The protuberance 303, base 301 and the recess 302 are inserted into the space between the abutment members 406 and 407. The protuberance 303 slide pass the upper slanted wall of the protuberance 407B and beyond. The protuberance 407B is accommodated in the recess 302. The protuberance 407B and the protuberance 303 abut one another to prevent separation of the second coupling

member 102 and the connector 103 in the direction along axis Y and thereby lock them together. The protuberance 407B is provided on the abutment 407 which is flexible and resilient. It therefore can be forced to deform slightly permitting the protuberance 303 to slide pass the protuberance 407B and return to its default state/shape thereafter.

[0050] The abutments 406 and 407 prevent the relative movement of the second coupling member 102 and the connector 103 in the direction along the axis Z. The partitioning wall 405 acts as a guard to prevent further insertion of the second coupling member 102 into the space between the abutment members 406 and 407. Also the retainers 406A and 407A are inserted into the respective recess 107 which helps lock the connector 103 to the second coupling member 102 and prevent their relative movement in a second direction along the axis Z.

[0051] The pair of detents 305 and 306 defines a pair of gaps 107. When the retainers 406A and 407A are inserted in the recess 107, hence the gap 107, the detents 305 and 306 abut sides of the abutments 406 and 407 and/or retainers 406A and 407A thereby prevent relative movement of the connector 103 and the second coupling member 102 in a third direction along the axis X. The abutment 406, the retainer 406A and/or the detent 411 press onto the pane 11 while the abutment 407 and/or its relevant retainer 407A and detent 412 presses onto the edge of the opening on the door 20 to assist in securing the pane 11 to the door 20.

[0052] In the preferred embodiment, the second coupling member 102 is snap fitted with the second fastener 103B.

[0053] In a preferred embodiment, the recess 107 is the gap 107.

[0054] There is at least one coupler 100 on each side of the frame 10 for coupling the frame parts 10A and 10B. Referring to Figures 6A and 6B, the coupling/assembling of the couplers 100 on two perpendicular sides of the frame 10 will prevent relative movement of the first coupling member 101, second coupling member 102 and the connector 103 in the direction along axis X.

[0055] In the preferred embodiment, there are two couplers 100 on two opposite sides of the frame 10 and one coupler 100 on another pair of opposite sides of the frame 10.

[0056] The term complementary used herein is intended to refer to being generally complementary but not exactly one being an exact inversion of the other. Thus, in the described embodiment, the shapes or cross-sections of the two formations 410 and 108 do not necessarily fill out or complete each other, so long as one formation is receivable in or capable of embracing the other to establish bodily inter-engagement.

[0057] The invention has been given by way of example only, and various other modifications of and/or alterations to the described embodiment may be made by persons skilled in the art without departing from the scope of the invention as specified in the appended claims.

Claims

1. A coupler (100) to form a frame (10) which then holds a pane (11) to an opening in a door (20) or the like, the coupler comprising:

a first and a second frame member (10A, 10B);
a first coupling member (101) operatively connected to the first frame member (10A);
a second coupling member (102) operatively connected to the second frame member (10B);
and

a connector (103) having opposite first and second parts for connecting with the first and second coupling members respectively, the first part having a first fastener (103A) for bodily engagement with the first coupling member (101) and the second part having a second fastener (103B) for bodily engagement with the second coupling member (102);

such that the first and second frame members (10A, 10B) are coupled together by the coupler (100), with the connector (103) extending through said opening and connecting with the first and second coupling members (101, 102), on opposite sides of said door or the like to thereby hold said pane in said opening,

characterized in that,

the first fastener (103A) and the first coupling member (101) include corresponding inter-engageable formations for bodily inter-engagement to prevent separation between the first fastener (103A) and the first coupling member (101), wherein the first fastener (103A) is configured to initially connect with the first coupling member (101) through relative linear movement in a direction transverse to the connector (103), and

the second fastener (103B) and the second coupling member (102) include inter-engageable formations for bodily engagement to prevent separation between the second fastener (103B) and the second coupling member (102), wherein the second coupling member (102) is configured to subsequently connect with the second fastener (103B) through a linear movement of the second coupling member (102) relative to the second fastener (103B) in a direction parallel to the connector (103).

2. The coupler (100) as claimed in claim 1, wherein the first pair of inter-engageable formations includes two complementary profiled engagement surfaces co-operable to effect bodily engagement between the first fastener (103A) and the first coupling member (101).
3. The coupler (100) as claimed in claim 2, wherein the

complementary profiled engagement surfaces include a protuberance (203, 402) and a recess (202, 403) for receiving the protuberance (203, 402).

4. The coupler (100) as claimed in any one of claims 1 to 3, wherein the engagement elements include a second pair of inter-engageable formations for inter-engagement to prevent relative movement between the connector (103) and the first coupling member (101) in a second direction perpendicular to the first direction, and optionally the second pair of inter-engageable formations include a groove (404) and a rib (204) for insertion into the groove (404) to effect bodily engagement between the connector (103) and the first coupling member (101).
5. The coupler (100) as claimed in claim 3, wherein the engagement elements include a second pair of inter-engageable formations for inter-engagement to prevent relative movement between the connector (103) and the first coupling member (101) in a second direction perpendicular to the first direction, the second pair of inter-engageable formations including a groove (404) and a rib (204) for insertion into the groove (404) to effect bodily engagement between the connector (103) and the first coupling member (101), wherein the groove (404) and the recess (202, 403) face in respective directions perpendicular to one another for bodily engagement with the rib (204) and the protuberance (203, 402) respectively to prevent relative movement between the connector (103) and the first coupling member (101) in mutually perpendicular first and second directions.
6. The coupler (100) as claimed in claim 4 or claim 5, wherein the connector (103) and the first coupling member (101) additionally include complementary formations for bodily engagement against relative movement in a third direction perpendicular to the first and second directions.
7. The coupler (100) as claimed in any one of claims 1 to 6, wherein the second fastener (103B) includes an abutment (406, 407) for abutment relative to the second coupling member (102) upon inter-engagement of the inter-engageable members, thereby fixing the relative position between the second fastener (103B) and the second coupling member (102) in a direction parallel to the first direction, and optionally:
 - a) the second fastener (103B) includes two said abutments (406, 407) which extend co-parallel but are of different lengths, and
 - b) the second coupling member (102) is associated with a void arranged to receive the or each abutment (406, 407) for engagement therewith to prevent relative movement between the con-

connector (103) and the second coupling member (102) in at least one of two mutually perpendicular directions perpendicular to the first direction.

8. The coupler (100) as claimed in claim 7, wherein the void includes a recess (107) arranged to receive the or each abutment (406, 407) for engagement therewith to prevent relative movement between the connector (103) and the second coupling member (102) in a second direction perpendicular to the first direction.
9. The coupler (100) as claimed in claim 7, wherein the void further includes a gap (107) arranged to receive the or each abutment (406, 407) for engagement therewith to prevent relative movement between the connector (103) and the second coupling member (102) in a third direction perpendicular to the first and second directions.
10. The coupler (100) of any one of the preceding claims wherein the first and second coupling members ((101, 102) are integrally formed with the first and second frame members (10A, 10B), respectively.
11. A method of coupling together first and second frame members to form a frame which then holds a pane to an opening in a door or the like by a coupler (100) comprising the steps of:

providing a first coupling member (101) operatively connected to the first frame member (10A);
 providing a second coupling member (102) operatively connected to the second frame member (10B); and
 providing a connector (103) having opposite first and second parts for connecting with the first and second coupling members (101, 102) respectively, the first part having a first fastener (103A) for bodily engagement with the first coupling member (101) and the second part having a second fastener (103B) for bodily engagement with the second coupling member (102); such that the first and second frame members (10A, 10B) are coupled together, by the coupler (101), with the connector (103) extending through said opening and connecting with the first and second coupling members (101, 102), on opposite sides of said door or the like to hold said pane in said opening,

characterized in that:

the first fastener (103A) and the first coupling member (101) include corresponding inter-engageable formations for bodily inter-engagement to prevent separation between the first fastener (103A) and the first

coupling member (101), the first fastener (103A) being initially connected with the first coupling member (101) through relative linear movement in a direction transverse to the connector (103), and
 the second fastener (103B) and the second coupling member (102) include inter-engageable formations for bodily engagement to prevent separation between the second fastener (103B) and the second coupling member (102), the second coupling member (102) being subsequently connected with the second fastener (103B) through a linear movement of the second coupling member (102) relative to the second fastener (103B) in a direction parallel to the connector (103).

12. The method as claimed in claim 13, wherein the second coupling member (102) is snap fitted with the second fastener (103B).

Patentansprüche

1. Kupplung (100) zum Formen eines Rahmens (10), der dann eine Fensterscheibe (11) an einer Öffnung in einer Tür (20) oder dergleichen hält, wobei die Kupplung Folgendes umfasst:

ein erstes und ein zweites Rahmenelement (10A, 10B),
 ein erstes Kupplungselement (101), das wirksam mit dem ersten Rahmenelement (10A) verbunden ist,
 ein zweites Kupplungselement (102), das wirksam mit dem zweiten Rahmenelement (10B) verbunden ist, und
 einen Verbinder (103), der einen ersten und einen gegenüberliegenden zweiten Teil zum Verbinden jeweils mit dem ersten beziehungsweise dem zweiten Kupplungselement aufweist, wobei der erste Teil ein erstes Befestigungselement (103A) für einen körperlichen Eingriff mit dem ersten Kupplungselement (101) aufweist und der zweite Teil ein zweites Befestigungselement (103B) für einen körperlichen Eingriff mit dem zweiten Kupplungselement (102) aufweist, derart, dass das erste und das zweite Rahmenelement (10A, 10B) durch die Kupplung (100) aneinander gekuppelt werden, wobei sich der Verbinder (103) durch die Öffnung erstreckt und sich mit dem ersten und dem zweiten Kupplungselement (101, 102) verbindet, auf gegenüberliegenden Seiten der Tür oder dergleichen, um dadurch die Fensterscheibe in der Öffnung zu halten,

dadurch gekennzeichnet, dass:

das erste Befestigungselement (103A) und das erste Kupplungselement (101) entsprechende miteinander in Eingriff zu bringende Formationen für einen körperlichen gegenseitigen Eingriff einschließen, um eine Trennung zwischen dem ersten Befestigungselement (103A) und dem ersten Kupplungselement (101) zu verhindern, wobei das erste Befestigungselement (103A) dafür konfiguriert ist, sich anfänglich durch eine relative lineare Bewegung in einer Richtung, quer zu dem Verbinder (103), mit dem ersten Kupplungselement (101) zu verbinden, und
 das zweite Befestigungselement (103B) und das zweite Kupplungselement (102) miteinander in Eingriff zu bringende Formationen für einen körperlichen Eingriff einschließen, um eine Trennung zwischen dem zweiten Befestigungselement (103B) und dem zweiten Kupplungselement (102) zu verhindern, wobei das zweite Kupplungselement (102) dafür konfiguriert ist, sich anschließend durch eine lineare Bewegung des zweiten Kupplungselements (102) relativ zu dem zweiten Befestigungselement (103B) in einer Richtung, parallel zu dem Verbinder (103), mit dem zweiten Befestigungselement (103B) zu verbinden.

2. Kupplung (100) nach Anspruch 1, wobei das erste Paar von miteinander in Eingriff zu bringenden Formationen zwei komplementär profilierte Eingriffsflächen einschließt, die zusammenwirken können, um einen körperlichen Eingriff zwischen dem ersten Befestigungselement (103A) und dem ersten Kupplungselement (101) zu bewirken.
3. Kupplung (100) nach Anspruch 2, wobei die komplementär profilierten Eingriffsflächen einen Vorsprung (203, 402) und eine Aussparung (202, 403) zum Aufnehmen des Vorsprungs (203, 402) einschließen.
4. Kupplung (100) nach einem der Ansprüche 1 bis 3, wobei die Eingriffselemente ein zweites Paar von miteinander in Eingriff zu bringenden Formationen für einen gegenseitigen Eingriff einschließen, um eine relative Bewegung zwischen dem Verbinder (103) und dem ersten Kupplungselement (101) in einer zweiten Richtung, senkrecht zu der ersten Richtung, zu verhindern, und wobei wahlweise das zweite Paar von miteinander in Eingriff zu bringenden Formationen eine Rille (404) und eine Rippe (204) zum Einsetzen in die Rille (404) einschließt, um einen körperlichen Eingriff zwischen dem Verbinder (103) und dem ersten Kupplungselement (101) zu bewirken.

5. Kupplung (100) nach Anspruch 3, wobei die Eingriffselemente ein zweites Paar von miteinander in Eingriff zu bringenden Formationen für einen gegenseitigen Eingriff einschließen, um eine relative Bewegung zwischen dem Verbinder (103) und dem ersten Kupplungselement (101) in einer zweiten Richtung, senkrecht zu der ersten Richtung, zu verhindern, wobei das zweite Paar von miteinander in Eingriff zu bringenden Formationen eine Rille (404) und eine Rippe (204) zum Einsetzen in die Rille (404) einschließt, um einen körperlichen Eingriff zwischen dem Verbinder (103) und dem ersten Kupplungselement (101) zu bewirken, wobei die Rille (404) und die Aussparung (202, 403) für einen körperlichen Eingriff jeweils mit der Rippe (204) beziehungsweise dem Vorsprung (203, 402) in jeweilige Richtungen, senkrecht zueinander, zeigen, um eine relative Bewegung zwischen dem Verbinder (103) und dem ersten Kupplungselement (101) in zueinander senkrechten ersten und zweiten Richtungen zu verhindern.
6. Kupplung (100) nach Anspruch 4 oder Anspruch 5, wobei der Verbinder (103) und das erste Kupplungselement (101) zusätzlich komplementäre Formationen für einen körperlichen Eingriff gegen eine relative Bewegung in einer dritten Richtung, senkrecht zu der ersten und der zweiten Richtung, einschließen.
7. Kupplung (100) nach einem der Ansprüche 1 bis 6, wobei das zweite Befestigungselement (103B) ein Widerlager (406, 407) für ein Widerlager im Verhältnis zu dem zweiten Kupplungselement (102) auf einen gegenseitigen Eingriff der miteinander in Eingriff zu bringenden Elemente hin einschließt, wodurch die relative Position zwischen dem zweiten Befestigungselement (103B) und dem zweiten Kupplungselement (102) in einer Richtung, parallel zu der ersten Richtung, fixiert wird, und wobei wahlweise:
- a) das zweite Befestigungselement (103B) zwei Widerlager (406, 407) einschließt, die sich im Verhältnis zueinander parallel erstrecken, aber unterschiedliche Längen haben, und
 - b) das zweite Kupplungselement (102) mit einem Hohlraum verknüpft ist, der dafür angeordnet ist, das oder jedes Widerlager (406, 407) für einen Eingriff mit demselben aufzunehmen, um eine relative Bewegung zwischen dem Verbinder (103) und dem zweiten Kupplungselement (102) in wenigstens einer von zwei zueinander senkrechten Richtungen, senkrecht zu der ersten Richtung, zu verhindern.
8. Kupplung (100) nach Anspruch 7, wobei der Hohlraum eine Aussparung (107) einschließt, die dafür angeordnet ist, das oder jedes Widerlager (406, 407) für einen Eingriff mit demselben aufzunehmen, um eine relative Bewegung zwischen dem Verbinder (103) und dem zweiten Kupplungselement (102) in einer zweiten Richtung, senkrecht zu der ersten Richtung, zu verhindern.
9. Kupplung (100) nach Anspruch 7, wobei der Hohlraum ferner eine Lücke (107) einschließt, die dafür angeordnet ist, das oder jedes Widerlager (406, 407) für einen Eingriff mit demselben aufzunehmen, um eine relative Bewegung zwischen dem Verbinder (103) und dem zweiten Kupplungselement (102) in einer dritten Richtung, senkrecht zu der ersten und der zweiten Richtung, zu verhindern.
10. Kupplung (100) nach einem der vorhergehenden Ansprüche, wobei das erste und das zweite Kupplungselement (101, 102) jeweils integral mit dem ersten beziehungsweise dem zweiten Rahmenelement (10A, 10B) geformt sind.
11. Verfahren zum Kuppeln eines ersten und eines zweiten Rahmenelements aneinander, um einen Rahmen zu bilden, der dann eine Fensterscheibe an einer Öffnung in einer Tür oder dergleichen hält, durch eine Kupplung (100), das die folgenden Schritte umfasst:
- das Bereitstellen eines ersten Kupplungselements (101), das wirksam mit dem ersten Rahmenelement (10A) verbunden ist,
- das Bereitstellen eines zweiten Kupplungselements (102), das wirksam mit dem zweiten Rahmenelement (10B) verbunden ist, und
- das Bereitstellen eines Verbinders (103), der einen ersten und einen gegenüberliegenden zweiten Teil zum Verbinden jeweils mit dem ersten beziehungsweise dem zweiten Kupplungselement (101, 102) aufweist, wobei der erste Teil ein erstes Befestigungselement (103A) für einen körperlichen Eingriff mit dem ersten Kupplungselement (101) aufweist und der zweite Teil ein zweites Befestigungselement (103B) für einen körperlichen Eingriff mit dem zweiten Kupplungselement (102) aufweist, derart, dass das erste und das zweite Rahmenelement (10A, 10B), durch die Kupplung (100), aneinander gekoppelt werden, wobei sich der Verbinder (103) durch die Öffnung erstreckt und sich mit dem ersten und dem zweiten Kupplungselement (101, 102) verbindet, auf gegenüberliegenden Seiten der Tür oder dergleichen, um die Fensterscheibe in der Öffnung zu halten,
- dadurch gekennzeichnet, dass:**
- das erste Befestigungselement (103A) und das erste Kupplungselement (101) entsprechende miteinander in Eingriff zu bringende

Formations für einen körperlichen gegenseitigen Eingriff einschließen, um eine Trennung zwischen dem ersten Befestigungselement (103A) und dem ersten Kupplungselement (101) zu verhindern, wobei das erste Befestigungselement (103A) anfänglich durch eine relative lineare Bewegung in einer Richtung, quer zu dem Verbinder (103), mit dem ersten Kupplungselement (101) verbunden wird, und das zweite Befestigungselement (103B) und das zweite Kupplungselement (102) miteinander in Eingriff zu bringende Formationen für einen körperlichen Eingriff einschließen, um eine Trennung zwischen dem zweiten Befestigungselement (103B) und dem zweiten Kupplungselement (102) zu verhindern, wobei das zweite Kupplungselement (102) anschließend durch eine lineare Bewegung des zweiten Kupplungselements (102) relativ zu dem zweiten Befestigungselement (103B) in einer Richtung, parallel zu dem Verbinder (103), mit dem zweiten Befestigungselement (103B) verbunden wird.

12. Verfahren nach Anspruch 11, wobei das zweite Kupplungselement (102) mit dem zweiten Befestigungselement (103B) eingerastet wird.

Revendications

1. Coupleur (100) pour former un châssis (10) qui maintient ensuite un carreau (11) sur une ouverture d'une porte (20) ou similaire, le coupleur comprenant :

des premier et deuxième éléments de châssis (10A, 10B) ;
un premier élément de couplage (101) raccordé de manière fonctionnelle au premier élément de châssis (10A) ;
un deuxième élément de couplage (102) raccordé de manière fonctionnelle sur le deuxième élément de châssis (10B) ; et
un connecteur (103) présentant des première et deuxième parties opposées permettant un raccordement avec les premier et deuxième éléments de couplage respectivement, la première partie présentant une première attache (103A) permettant une mise en prise matérielle avec le premier élément de couplage (101) et la deuxième partie présentant une deuxième attache (103B) permettant une mise en prise matérielle avec le deuxième élément de couplage (102) ;
de telle manière que les premier et deuxième éléments de châssis (10A, 10B) sont couplés ensemble, grâce au coupleur (100), avec le con-

necteur (103) s'étendant à travers ladite ouverture et se raccordant aux premier et deuxième éléments de couplage (101, 102), sur des côtés opposés de ladite porte ou similaire afin de maintenir ainsi ledit carreau dans ladite ouverture,

caractérisé en ce que,

la première attache (103A) et le premier élément de couplage (101) comprennent des formations correspondantes, pouvant être mises mutuellement en prise en vue d'une mise en prise matérielle mutuelle afin d'empêcher une séparation entre la première attache (103A) et le premier élément de couplage (101), dans lequel la première attache (103A) est configurée pour se raccorder initialement au premier élément de couplage (101) par l'intermédiaire d'un mouvement linéaire relatif dans une direction transversale par rapport au connecteur (103), et la deuxième attache (103B) et le deuxième élément de couplage (102) comprennent des formations pouvant être mises mutuellement en prise en vue d'une mise en prise matérielle afin d'empêcher une séparation entre la deuxième attache (103B) et le deuxième élément de couplage (102), dans lequel le deuxième élément de couplage (102) est configuré pour se raccorder ensuite à la deuxième attache (103B) par l'intermédiaire d'un mouvement linéaire du deuxième élément de couplage (102) par rapport à la deuxième attache (103B) dans une direction parallèle au connecteur (103).

2. Coupleur (100) selon la revendication 1, dans lequel la première paire de formations pouvant être mises mutuellement en prise comprend deux surfaces de mise en prise profilées complémentaires pouvant être utilisées conjointement pour réaliser une mise en prise matérielle entre la première attache (103A) et le premier élément de couplage (101).
3. Coupleur (100) selon la revendication 2, dans lequel les surfaces de mise en prise profilées complémentaires comprennent une protubérance (203, 402) et un renforcement (202, 403) permettant d'accueillir la protubérance (203, 402).
4. Coupleur (100) selon l'une quelconque des revendications 1 à 3, dans lequel les éléments de mise en prise comprennent une deuxième paire de formations pouvant être mutuellement mises en prise en vue d'une mise en prise mutuelle afin d'empêcher un mouvement relatif entre le connecteur (103) et le premier élément de couplage (101) dans une deuxième direction perpendiculaire à la première direction, et éventuellement la deuxième paire de formations pouvant être mutuellement mises en prise comprend une rainure

(404) et une nervure (204) à insérer dans la rainure (404) afin de réaliser une mise en prise matérielle entre le connecteur (103) et le premier élément de couplage (101).

5. Coupleur (100) selon la revendication 3, dans lequel les éléments de mise en prise comprennent une deuxième paire de formations pouvant être mutuellement mises en prise en vue d'une mise en prise mutuelle afin d'empêcher un mouvement relatif entre le connecteur (103) et le premier élément de couplage (101) dans une deuxième direction perpendiculaire à la première direction, la deuxième paire de formations pouvant être mutuellement mises en prise comprenant une rainure (404) et une nervure (204) à insérer dans la rainure (404) afin de réaliser une mise en prise matérielle entre le connecteur (103) et le premier élément de couplage (101), dans lequel la rainure (404) et le renforcement (202, 403) regardent dans des directions respectives perpendiculaires l'une à l'autre en vue d'une mise en prise matérielle avec la nervure (204) et la protubérance (203, 402) respectivement afin d'empêcher un mouvement relatif entre le connecteur (103) et le premier élément de couplage (101) dans des première et deuxième directions mutuellement perpendiculaires.

6. Coupleur (100) selon la revendication 4 ou 5, dans lequel le connecteur (103) et le premier élément de couplage (101) comprennent de manière supplémentaire des formations complémentaires en vue d'une mise en prise matérielle à l'encontre d'un mouvement relatif dans une troisième direction perpendiculaire aux première et deuxième directions.

7. Coupleur (100) selon l'une quelconque des revendications 1 à 6, dans lequel la deuxième attache (103B) comprend un jambage (406, 407) permettant un appui par rapport au deuxième élément de couplage (102) lors d'une mise en prise mutuelle des éléments pouvant être mutuellement mis en prise, ce qui fixe la position relative entre la deuxième attache (103B) et le deuxième élément de couplage (102) dans une direction parallèle à la première direction, et éventuellement :

- a) la deuxième attache (103B) comprend deux jambages (406, 407) qui s'étendent de manière co-parallèle mais sont de différentes longueurs, et
- b) le deuxième élément de couplage (102) est associé à un vide agencé pour accueillir ledit, ou chaque, jambage (406, 407) en vue d'une mise en prise avec celui-ci afin d'empêcher un mouvement relatif entre le connecteur (103) et

le deuxième élément de couplage (102) dans au moins une parmi deux directions mutuellement perpendiculaires et perpendiculaires à la première direction.

8. Coupleur (100) selon la revendication 7, dans lequel le vide comprend un renforcement (107) agencé pour accueillir le, ou chaque, jambage (406, 407) en vue d'une mise en prise avec celui-ci afin d'empêcher un mouvement relatif entre le connecteur (103) et le deuxième élément de couplage (102) dans une deuxième direction perpendiculaire à la première direction.

9. Coupleur (100) selon la revendication 7, dans lequel le vide comprend en outre un espace (107) agencé pour accueillir le, ou chaque, jambage (406, 407) en vue d'une mise en prise avec celui-ci afin d'empêcher un mouvement relatif entre le connecteur (103) et le deuxième élément de couplage (102) dans une troisième direction perpendiculaire aux première et deuxième directions.

10. Coupleur (100) selon l'une quelconque des revendications précédentes, dans lequel les premier et deuxième éléments de couplage (101, 102) sont formés d'un seul tenant avec les premier et deuxième éléments de châssis (10A, 10B), respectivement.

11. Procédé de couplage de premier et deuxième éléments de châssis ensemble afin de former un châssis qui maintient ensuite un carreau sur une ouverture d'une porte ou similaire grâce un coupleur (100) comprenant les étapes consistant à :

fournir un premier élément de couplage (101) raccordé de manière fonctionnelle au premier élément de châssis (10A) ;
fournir un deuxième élément de couplage (102) raccordé de manière fonctionnelle au deuxième élément de châssis (10B) ; et
fournir un connecteur (103) présentant des première et deuxième parties opposées permettant un raccordement avec les premier et deuxième éléments de couplage (101, 102) respectivement, la première partie présentant une première attache (103A) permettant une mise en prise matérielle avec le premier élément de couplage (101) et la deuxième partie présentant une deuxième attache (103B) permettant une mise en prise matérielle avec le deuxième élément de couplage (102) ; de telle manière que les premier et deuxième éléments de châssis (10A, 10B) sont couplés ensemble, grâce au coupleur (101), avec le connecteur (103) s'étendant à travers ladite ouverture et se raccordant aux premier et deuxième éléments de couplage (101, 102), sur des côtés opposés de ladite porte ou

similaire afin de maintenir ledit carreau dans la dite ouverture,

caractérisé en ce que :

la première attache (103A) et le premier élément de couplage (101) comprennent des formations correspondantes pouvant être mutuellement mises en prise en vue d'une mise en prise matérielle mutuelle afin d'empêcher une séparation entre la première attache (103A) et le premier élément de couplage (101), la première attache (103A) étant initialement raccordée au premier élément de couplage (101) par l'intermédiaire d'un mouvement linéaire relatif dans une direction transversale par rapport au connecteur (103), et

la deuxième attache (103B) et le deuxième élément de couplage (102) comprennent des formations pouvant être mutuellement mises en prise en vue d'une mise en prise matérielle afin d'empêcher une séparation entre la deuxième attache (103B) et le deuxième élément de couplage (102), le deuxième élément de couplage (102) étant ensuite raccordé à la deuxième attache (103B) par l'intermédiaire d'un mouvement linéaire du deuxième élément de couplage (102) par rapport à la deuxième attache (103B) dans une direction parallèle au connecteur (103).

12. Procédé selon la revendication 11, dans lequel le deuxième élément de couplage (102) est fixé par encliquetage à la deuxième attache (103B).

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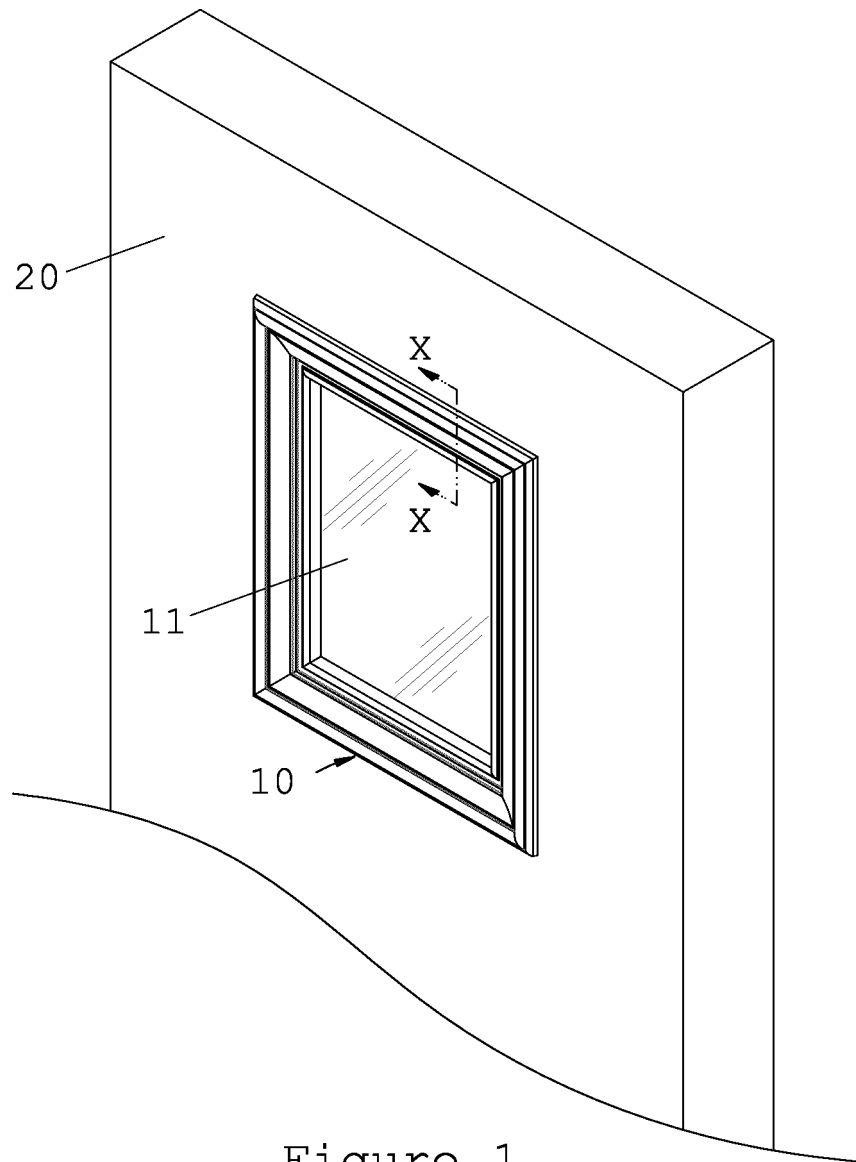


Figure 1

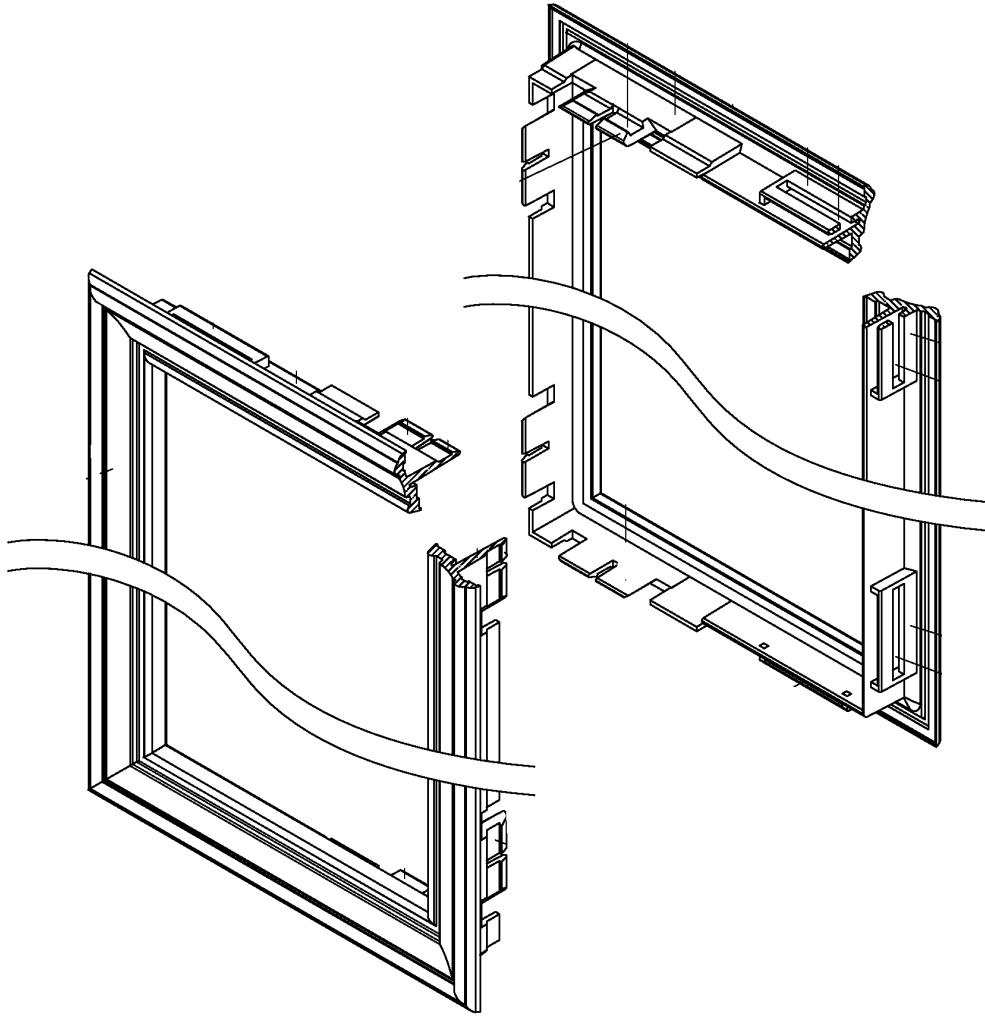


Figure 2

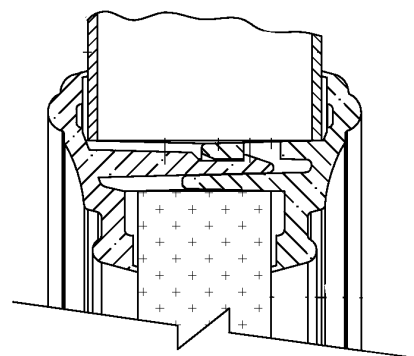


Figure 3

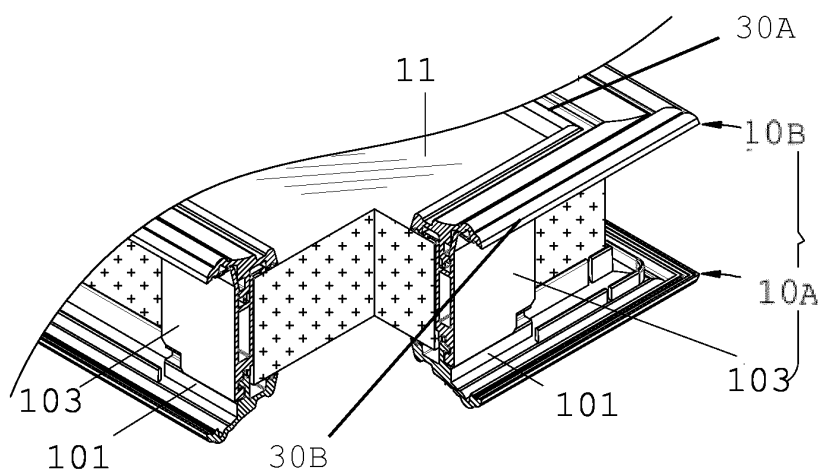


Figure 4

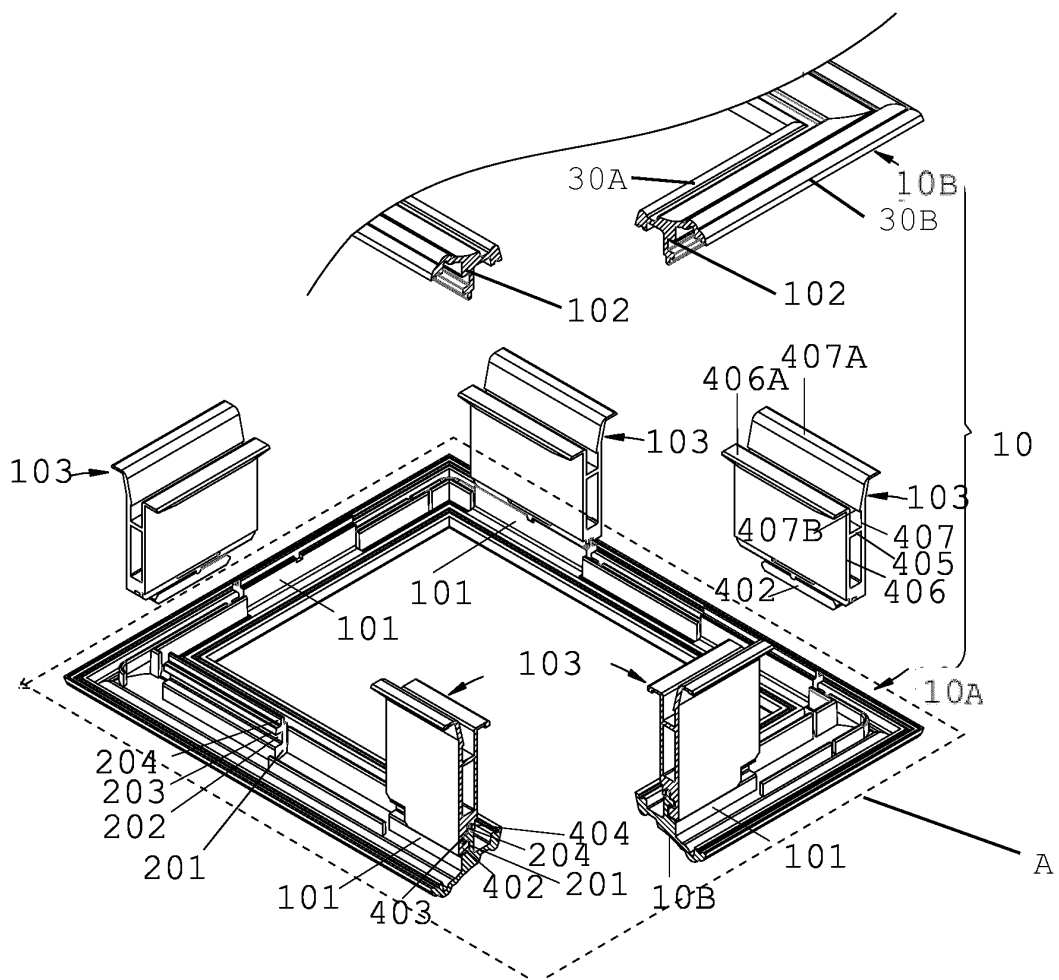
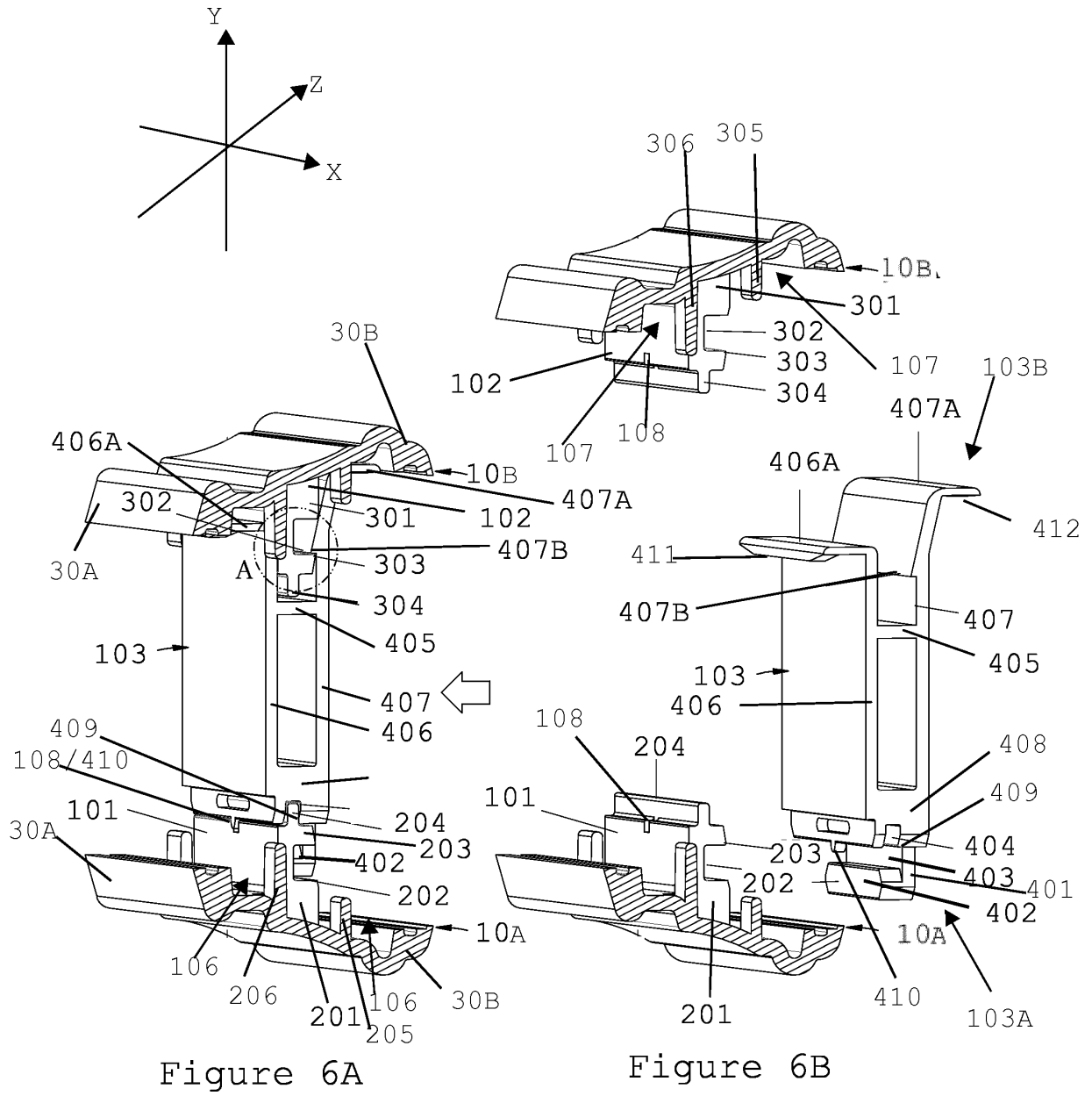


Figure 5



REFERENCES CITED IN THE DESCRIPTION

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