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(54) Constructional element

(57) The invention relates to a constructional element comprising a central hinging member (60,67,68,73-75) and a first and second connection plate (61,62,65,66,71,72), wherein the central member comprises at least a first arm (60,67) which is on each side hingingly connected to the connection plates, at least one of the connection plates comprising connection means (25,25') for attaching the at least one connection plate to a rigid body. A preferred embodiment of a constructional element comprises a central hollow member (2) and a first and second connection plate, wherein the central member comprises four arms (5-8), each arm having a base end (9,10) and a free end (15,16),

- a first and a second arm (5,6) being with their base ends (9) connected to the first connection plate (3) in a first lateral hinge point (21),
- a third and a fourth arm (7,8) being connected with their base ends (10) to the second connection plate in a second lateral hinge point (22),
- the free ends (15) of the first and third arm (5,7) being mutually connected in a first free hinge point (23),
- the free ends (16) of the second and fourth arm (6,8) being mutually connected in a second free hinge point (24), wherein at least one of the connection plates (3,4) comprises connection means (25,25',26,26';27,27') for attaching to a rigid body.

The constructional element can be used as a door- or window frame and can connect window panes to a building at different orientations and can be adapted to different geometries. The constructional element can also be used to form constructions such as platforms, pyramids or geodesic domes.

fig-21

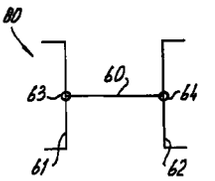


fig-22

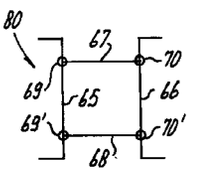
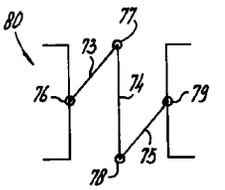


fig-23



EP 0 765 985 A1

Description

Field of the Invention

The invention relates to a constructional element for attachment to a rigid body and to constructions comprising such elements.

Background of the Invention

Constructional elements for attaching two or more rigid bodies are widely known. Such elements may comprise clamps, brackets, flanges, hinges or the like. The known constructional elements can often only be applied in a single orientation, such that for different geometries of rigid bodies that are to be connected, different constructional elements for connection of these bodies are required. The known constructional elements for connecting the rigid bodies, may comprise hinging or rotating parts which can adapt to different positions of the rigid bodies. Such hinging parts often lack the required shape-stability and will tend to leave a gap between the rigid bodies through which wind and/or rain can pass.

In the building industry, constructional elements may comprise frame works, such as door frames or window frames which are on one side attached to a wall and on another side carry window panes. When fitting a building with such window frames many differently sized window frame elements are needed. This increases the complexity and hence the cost of construction.

Constructional elements are also used for the construction of geodesic buildings such as halls, domes, or temporary accommodations. The constructional elements are interconnected to form a self-supporting framework. Often, an empty space is left between the constructional elements, such that the structures formed thereby are not wind- and/or waterproof of their own accord.

It therefore is an object of the present invention to provide a constructional element which can be connected to one or more rigid bodies at varying orientations.

It is another object of the present invention to provide a constructional element which can connect two rigid bodies in a sealing manner, i.e. without leaving any gaps between these bodies.

It is again another object of the invention to provide a constructional element which can be connected to a frame or fixture on a wall in a building to form a door frame or a window frame of varying dimensions that can either be opened or that is permanently closed.

It is again another object of the present invention to provide a constructional element which is of a relatively simple construction and which can be easily formed from for instance a plastic material.

It is also an object of the invention to provide a constructional element which can be formed at a continuous length and which can be cut by the user to the desired length.

Summary of the Invention

A constructional element according to the present invention thereto comprises a central hinging member and a first and second connection plate, wherein the central member comprises at least a first arm which is on each side hingingly connected to the connection plates, wherein at least one of the connection plates comprises connection means for attaching the at least one connection plate to a rigid body.

The constructional element of the present invention allows the connection plates to be placed at various angles with respect to one another by hinging these plates around the hinge points with respect to the arm. Furthermore, the distance between the connection plates can be varied by hinging the arm around the hinge points. While doing so, the arm at all times bridges the space between the connection plates, such that a wind- and liquid-tight barrier is formed thereby. Planar rigid bodies can in this way be connected to form complex structures using a single type of constructional element according to the present invention. The constructional elements provide a consistent method of fixing all sides of a planar rigid body. The rigid body can be of a curved or other three dimensional construction as long as its peripheral sides are rectilinear. The peripheral sides may be curvilinear if the constructional element comprises sufficient flexibility to conform to the sides.

A connection plate is shaped in such a way that it does not hinder the function of the other connection plate in any position. This may result in a lateral hinge point which is symmetrically positioned on the connection plate. But this does not necessarily have to be the case. Ideally the constructional element shows, from left to right, a connection plate, a single central member and again a connection plate. This is an architectural objective and to a certain extent a functional one.

The constructional element is of simple construction and allows production by for instance extrusion moulding to form single-piece constructional elements. Such single-piece constructional elements may be simply connected to planar rigid bodies by a snap-fastener and can be cut to the right size on the production site of the elements or even on the building site, to fit different angles, shapes and geometries of the construction. These geometries include a simple fixed window pane in an opening in a wall, as well as series of individual, vertically or horizontally aligned adjacent windows. The window panes can be connected around internal or external corners, and may be positioned in a plane or in an irregular shape. The windows may be permanently closed or may be openable.

The constructional element according to the present invention can advantageously be used in buildings, where the element is to form window frames for carrying window panes, or door frames. Generally, for

door frames and window frames, between 40 and 50 differently sized constructional elements may be necessary in order to be able to fit all possible details of buildings. By using the constructional element according to the present invention, door frames and window frames of different geometries and widths can be produced from a single type of element, or from a very small number of similar elements according to the present invention. Thereby a significant simplification of the building process is achieved.

Other applications of the constructional elements according to the present invention, are the construction of three dimensional domes, pyramids or other constructions, wherein rigid planar elements such as glass panes, wooden panels or plastic plates or any other sheet material are connected together in a wind- and watertight manner.

In an embodiment of the constructional element according to the invention an additional arm is hingingly connected between the connection plates, wherein the additional arm is either parallel with the first arm or is an extension of the first arm.

This construction can be easily fixed into a shape-stable position by means of an internal reinforcement placed between the arms.

In another embodiment of the constructional element according to the invention the first arm comprises three arm sections, a first arm section being with one end hingingly connected to the first con-nection plate, a second arm section being with one end hingingly connected to the second connection plate and a third arm section being with its end hingingly connected to inward ends of the first and second arm sections.

In this embodiment, the distance between the connection plates can be varried without causing a relative shift of the connection plates.

In a preferred embodiment the constructional element according to the invention comprises a central hollow member and a first and second connection plate, wherein the central member comprises four arms, each arm having a base end and a free end,

- a first and a second arm being with their base ends connected to the first connection plate in a first lateral hinge point,
- a third and a fourth arm being connected with their base ends to the second connection plate in a second lateral hinge point,
- the free ends of the first and third arm being mutually connected in a first free hinge point,
- the free ends of the second and fourth arm being mutually connected in a second free hinge point, wherein at least one of the connection plates comprises connection means for attaching the at least one connection element to a rigid body.

With the preferred embodiment, many different relative positions of the connection plates can be achieved, which can be locked into position by the use of a simple reinforcement element that is placed inside the hollow member.

In one embodiment, the connection plates are of U-shaped cross section, having a first leg carrying the lateral hinge points and two transverse legs, connected to the attachment means, each outward leg being connected to the first leg via a relatively flexible material. The flexible material may for instance be comprised of a natural or synthetic elastomeric material.

In this manner, the constructional element can be used as a window frame, in which each of the connection plates carries one or more window panes. The flexible material sealingly connects the window panes to the connection plates in a waterproof manner. The flexible material may be cut loose from the connection plate in those places where the window is to be opened and closed. In this case, the flexible parts which have been cut abut against the connection plates upon closing of the window and form sealing rims around the window.

The constructional element according to the present invention, may be combined to form units which have an L-shape, T-shape or cross construction.

Brief Description of the Drawings

The invention will be explained in detail with reference to the accompanying drawings. In the drawings:

Figures 1-3 show a schematic view of the constructional element according to the present invention wherein the connection plates are in a parallel configuration at varying distance from one another,
Figure 4 shows a constructional element wherein the connection means are arranged in parallel with the connection plates,
Figure 5 shows an embodiment wherein the connection means are arranged perpendicularly to the connection plates,
Figure 6 shows an embodiment of the constructional element according to the present invention as a door frame,
Figures 7 and 8 show the constructional element according to the present invention in the form of a window frame connecting a window pane perpendicularly and parallel to a wall, respectively,
Figures 9-16 show the different stages in the process of forming a window frame from a plastic constructional element according to the present invention,
Figures 17a-20b show different configurations of the constructional element forming a window frame, and
Figures 21-23 show alternative embodiments of a constructional element according to the invention.

Figure 1 shows a constructional element 1 comprising a central hollow member 2 which is formed by four arms 5, 6, 7 and 8. The arms 5-8 are with their free ends 15, 16 hingingly connected. The arms 5-8 are with their

base ends 9, 10 hingingly connected to connection plates 3 and 4. At least one of the connection plates 3, comprises connection means 25 for attachment to a rigid body. The connection means 25 in this case comprise strips 19 and 20 between which a rigid body can be clamped, glued, screwed or otherwise connected.

The connection plates 3 and 4 can be placed in close proximity by orienting the arm pairs 5 and 7 and 6 and 8 in a mutually parallel relationship respectively. This is shown in figure 2. By placing the arms 5, 6 and 7, 8, respectively in a parallel relationship, the connection plates 3 and 4 are separated to their maximum extent. This is shown in figure 3.

The arms 5-8 form at all times a sealing connection between the plates 3 and 4, through which no wind or rain can enter. This makes the constructional element 1 especially suitable for forming building constructions which are to be weather-proof. The length of the arms 5-8 may range between a few mm and a few m such as for instance 5 cm and 50 cm, whereas the dimension of the arms 5-8 in the direction perpendicular to the plane of the drawing can range from at least 30 centimetres to a few metres. For example for forming window frames the length of the arms is about 2.5 cm, wheras the dimension perpendicular to the plane of the drawing is 1.2 m.

Figure 4 shows an embodiment wherein each connection plate 3, 4 is provided with brackets 26, 26' which are oriented parallel to the connection plates. In this way, rigid bodies 28, 28', and 35 and 35' may be held by the brackets 26, 26' in an orientation generally parallel to the connection plates 3 and 4.

Figure 5 shows an embodiment wherein the connection means comprises brackets 27, 27' which extend generally perpendicular to the connection plates 3, 4. In this way rigid planar bodies 28, 35 may be connected to the constructional elements and may extend in a general direction which is perpendicular to the connection plates 3 and 4.

The arms 5-8 and the connection plates 3 and 4 may all be formed by separate elements, or may comprise a single piece of material as shown in figures 9-16. The material of the separate elements may comprise metal, wood, plastic, or any combination thereof. The hinges 21-24 may be comprised of flexible strips or bands for instance made of rubber or any other flexible material, a hinge bolt and bushing or may comprise a line of thinning in case the arms are all made of a single piece of material such as a plastic material or aluminium. The hinges 21-24 may be located on the inside or on the outside of the hollow member 2.

In figures 1-5, the orientation of the connection plates 3, 4 is shown to be generally parallel. However, the connection plates 3, 4 may be hinged around hinge points 21, 22 to assume any relative angle, up to 90°, or slightly larger than that if the functionality of the connection plates and the associated functions are not impaired. While the length of the constructional element 1 of figures 1-5, extending perpendicularly to the plane of the drawings, may range from several centimetres to several metres, the connection plates 3, 4 may, but need not be of equal length as the central hollow member 2.

In figure 6 it is shown that the constructional element 1 forms a door frame which is connected to a wall 36. In this case, only the connection plate 3 comprises connection means 25, which engage with a projection 37 on the wall 36. The projection 37 may for instance be formed by a strip of wood. The connection plate 4 in this case forms a smooth surface. Inside the hollow member 2, a reinforcement element 34 is provided for keeping the arms 5-8 in their desired position. The reinforcement element 34 may comprise a cross-shaped element or a solid rod, but preferably comprises a hollow tubular element. The position of the connection plates 3, 4 are fixed by weld points 38 or by adhesively or otherwise connecting the connection plates 3 and 4 to arms 5-8. The hinging attachment of the connection plates 3, 4 to the arms 5-8 is not maintained and is fixed and immobilized in the right orientation of the connection plates.

A cap 40 may be provided to bridge the space between the end faces of the connection plates 3 and 4 and to cover the arms 5-8 for aesthetic purposes. However, as the connection between the arms 5-8 and the connection plates 3 and 4 is water- and windtight, no protection cap 40 is required for constructional purposes, although additional rigidity is provided by such a protection cap.

Although it is preferred that the connection means 25, 25', which are provided on the connection plates 3, 4 are identical for each connection plate, they may also be different. This is shown in figure 7, wherein a window pane 42 is connected to connection means 25', wherein the connection means 25 are connected to a wooden strip 37 which is connected to wall 36. In this case the constructional element 1 has been placed in a configuration with a rectangular cross section. The connection plates 3 and 4 are off-set with respect to one another in the direction parallel to the connection plates. In this way, it is possible to easily fit the window panes 42 in a plane which is off-set from the plane of the wall 36.

Figure 8 shows a construction wherein the window pane 42 is perpendicular to the wall 36. In this case, the connection plates 3 and 4 are placed in a mutually perpendicular position. The constructional element 1 in figures 7 and 8 is kept in a rectangular configuration by means of a tubular reinforcement element 34 of rectangular cross-section which is inserted into the hollow member 2.

Figure 9 shows a constructional element which is formed from a single piece of two different materials by extrusion moulding. The arms 5-8 and the connection plates 3 and 4 are formed from a single piece of plastic material, such as for instance PVC, PE, ABS etc.. The free hinge points 23, 24 and the lateral hinge points 21, 22 are formed by a reduction in thickness of the material of the arms 5-8.

The connection plates 3, 4 are of U-shaped cross section and comprise longitudinal legs 43, 43' and transverse legs 44, 44'; 45, 45'. The transverse legs are

made of a flexible material, such as a synthetic rubber material. Each free end of the transverse legs 44, 44'; 45, 45' carries connection means 25, 25'. The connection means of the upper transverse legs 44, 44' comprise a sealing ring 46, 46' and upper halves 47, 47' of two lateral grooves. The upper half of the connection means comprises recesses 49, 49', which can clampingly engage with projections 50, 50' of the lower halves of the connection means. The lower halves of the connection means 25, 25' comprise the lower part 48, 48' of the grooves.

Figure 9 shows the configuration of the constructional element according to the invention right after injection moulding.

Figure 10 shows the constructional element put in a position for transportation to a construction site. In the configuration according to figure 10, the constructional element consumes a minimum of space. The lower halves of the connection means 25, 25' are engaged with the upper halves by means of resilient tongues 51, 51'. The tongues are shaped in such a manner that a precisely cut glass pane will slide into the right position when pressing the connection means 25 into each other. In case insulation glass is used, the inner glass pane, which is from all sides enclosed by tongues, can carry loads, which is a novelty in the industry or which has until now not been possible/common for safety reasons. Care is taken that the projections 50 on the lower halves of the connection means do not engage with the recesses 49, 49' of the upper halves. The arms 5-8 are placed in a generally parallel, vertical configuration.

At the construction site, the lower transverse legs 45, 45' can be separated from the vertical legs 43, 43'. The upper and the lower transverse leg is cut, but not both. Which leg is cut depends on which side of the moving window should turn outward or inward. In this manner, the lower part of the connection means 25, 25' can be displaced in a direction parallel to the vertical legs 43, 43' with respect to the upper part. In case the constructional element is to be used in its flattened state, the arms 5-8 can be pressed together such that projections 52, 52' and 53, 53' on the arms 5-8 engage with recesses 54, 54' on the arms 43, 43'. The lower parts of the connection means 25, 25' can be cut off at the desired length, as shown in figure 13. Thereafter reinforcement member 56, 56' can be inserted in the hollow lower members of the connection means 25, 25'. The reinforcement members 56, 56' are preferably formed of metal, but may comprise wood or any other stiff reinforcing material. After insertion of the reinforcement members 56, 56', the window panes 57, 57' are engaged with the upper halves 47, 47' of the grooves. In this embodiment the windows 57, 57' are window panes with double glazing. Finally, the lower part of the connection means 25, 25' is engaged with the upper part by engaging the projections 50, 50' on the lower parts with the recesses 49, 49' of the upper parts of the connection means. The lower parts of the construction means 25, 25' can be glued to form stiff frames, which can be taken out with a special tool that is inserted between projections 52, 52' and recesses 54, 54', in case a broken pane needs to be removed.

Figures 17a to 18b show embodiments wherein the central hollow member 2 is of square cross section. The connection plates are parallel in figure 17a but are displaced with respect to each other by half the length of the connection plates. In figure 18a the connection plates are at a mutual angle of 90°. In figures 17b and 18b it is shown how the windows are opened and how the transverse legs of one connection plate have been cut to form sealing rims around the window pane.

In figures 19a and 19b, the central hollow member 2 is of diamond-shaped cross section, the angle of the connection plates being acute. In the embodiment of figures 20a and 20b, the central hollow member is closed and the connection plates are placed in a parallel position. It is apparent from figures 17a-20b that numerous different configurations can be formed by which the constructional element 1 according to the present invention can attach two rigid bodies 28, 28', preferably window panes, at different relative positions. In this way, using a single element, all the window frames and door posts in any building can be formed. This results in major savings in building costs. The constructional element according to the present invention offers the possibility to form stiff frames by cutting linear elements and joining them either mitered or butt.

Figure 21 shows an alternative embodiment of a constructional element in which a single arm 60 is connected in hinge points 63 and 64 to connection plates 61, 62. In the embodiment of figure 22 two parallel arms 67, 68 are connected to the connection plates 65, 66 in separate hinge points 69, 69', 70 and 70'. In figure 23 an embodiment is shown in which two arm sections 73 and 75 are connected to the connection plates 71 and 72 in hinge points 76 and 79. The ends of the arms 73 and 75 are connected to a central arm section 74 in hinge points 77 and 78.

The constructional element according to the invention is not limited to be used as a door- or window frame only, but can be made to form three dimensional constructions, such as platforms, pyramids, or geodesic domes. The advantage of the constructional element according to the present invention is that it forms a closed structure which is not penetrated by wind or rain, such that it can form water- and wind resistant constructions.

Claims

1. Constructional element (80) comprising a central hinging member (60, 67, 68, 73, 74, 75) and a first and second connection plate (61, 62, 65, 66, 71, 72), wherein the central member comprises at least a first arm (60, 67) which is on each side hingingly connected to the connection plates, at least one of the connection plates comprising connection means for attaching the at least one connection

plate to a rigid body.

2. Constructional element (80) according to claim 1, wherein an additional arm (68) is hingingly connected between the connection plates (65, 66), the additional arm (68) being parallel with the first arm (67) or being an extension of the first arm.

3. Constructional element (80) according to claim 1, wherein the first arm comprises three arm sections (73, 74, 75), a first arm section (73) being with one end hingingly connected to the first connection plate (71), a second arm section (75) being with one end hingingly connected to the second connection plate (72) and a third arm section (74) being with its ends hingingly connected to inward ends of the first and second arm sections (73, 75).

4. Constructional element (1) comprising a central hollow member (2) and a first and second connection plate (3, 4), wherein the central member (2) comprises four arms (5, 6, 7, 8), each arm having a base end (9, 10) and a free end (15, 16),

- a first and a second arm (5, 6) being with their base ends (9) connected to the first connection plate (3) in a first lateral hinge point (21),
- a third and a fourth arm (7, 8) being connected with their base ends (10) to the second connection plate (4) in a second lateral hinge point (22),
- the free ends (15) of the first and third arm (5, 7) being mutually connected in a first free hinge point (23),
- the free ends (16) of the second and fourth arm (6, 8) being mutually connected in a second free hinge point (24), wherein at least one of the connection plates (3, 4) comprises connection means (25, 25'; 26, 26'; 27, 27') for attaching the at least one connection plate (3, 4) to a rigid body.

5. Constructional element according to any of claims 1 to 4, wherein the central hinging member (2) and the connection plates (3, 4) each comprise a length of at least 30 cm, preferably at least 50 cm, most preferably at least 100 cm.

6. Constructional element (1) according to any of the previous claims, wherein at least the arm section (5, 6, 7, 8) are formed by a single piece of material, the lateral hinge points (21, 22) and the free hinge points (15, 16) comprising a reduction in the thickness of the material.

7. Constructional element (1) according to claim 6, wherein the arms (5, 6, 7, 8) and the connection plates (3, 4) are made of a single piece of material.

8. Constructional element (1) according to any of the previous claims, wherein the central hinging member (2) and the connection plates (3, 4) are elongated elements, wherein the connection means (25, 25') comprise on at least one connection plate (3, 4) two strips (19, 20) that laterally project from the surface of the connection plate (3, 4) for receiving a planar rigid body, the thickness of which generally corresponds to the distance between the strips (19, 20).

9. Constructional element (1) according to any of the previous claims, wherein the connection means (26, 26') extend parallel to the at least one connection plate (3, 4) for attaching the planar bodies generally parallel to the at least one connection plate (3, 4).

10. Constructional element (1) according to claim 8, wherein the connection means (27, 27') extend transversely to the at least one connection plate (3, 4) for attaching the planar bodies generally perpendicular to the at least one connection plate (3, 4).

11. Constructional element (1) according to any of the previous claims, wherein the element forms a part of a door frame or a window frame for carrying window panes, which is on one side connectable to a wall of a building.

12. Constructional element (1) according to any of the previous claims, wherein the connection plates (3, 4) are of U-shaped cross section, having a first leg (43, 43') carrying the lateral hinge points (21, 22) and two transverse legs (44, 44'; 45, 45'), connected to the attachment means (25, 25'), each transverse leg (44, 44'; 45, 45') being connected to the first leg (43, 43') via a relatively flexible material.

13. Constructional element (1) according to any of the previous claims, wherein the central hollow member (2) comprises an internal reinforcement element (34) for defining the configuration of the arms (5, 6, 7, 8).

14. Constructional unit comprising at least two constructional elements (1) according to one of the previous claims, wherein two elements are connected in an L-shaped manner, three elements are connected in a T-shaped manner or four elements are connected in a cross-shaped manner.

fig-1

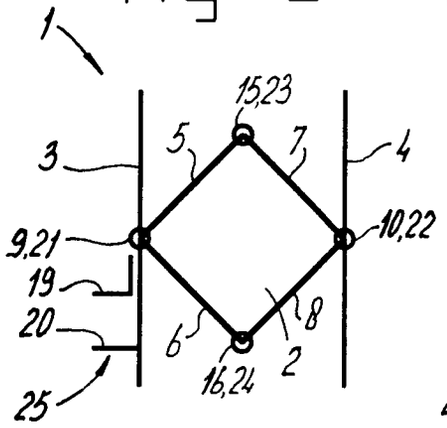


fig-2

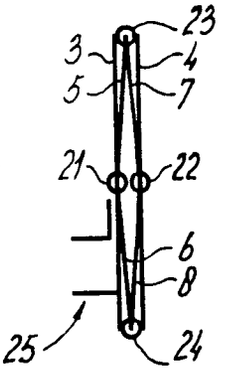


fig-3

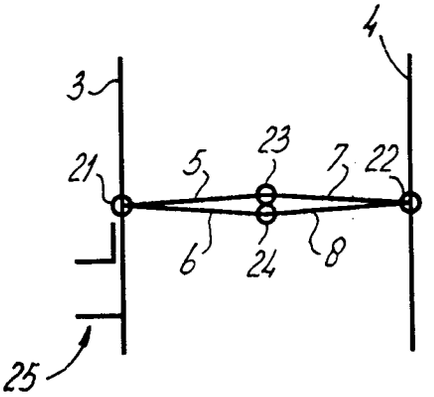


fig-4

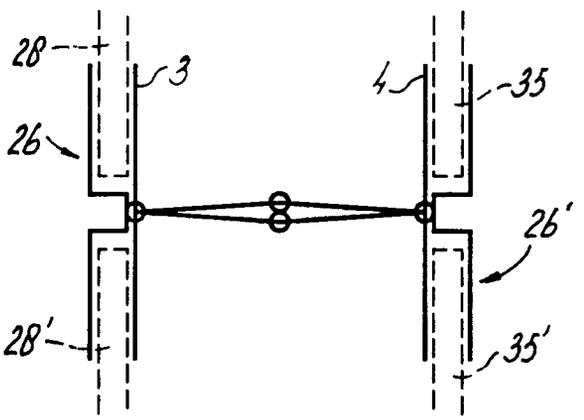


fig-5

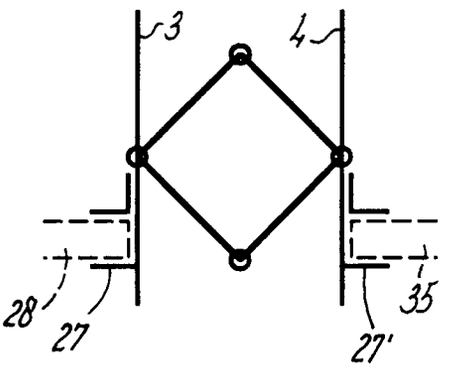


fig-6

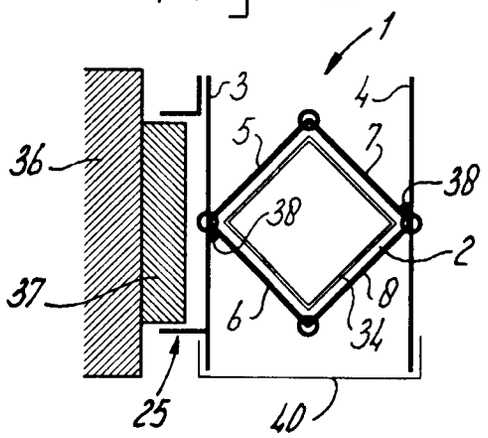


fig-7

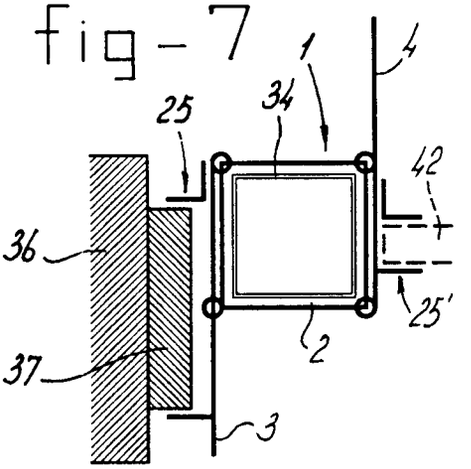


Fig-8

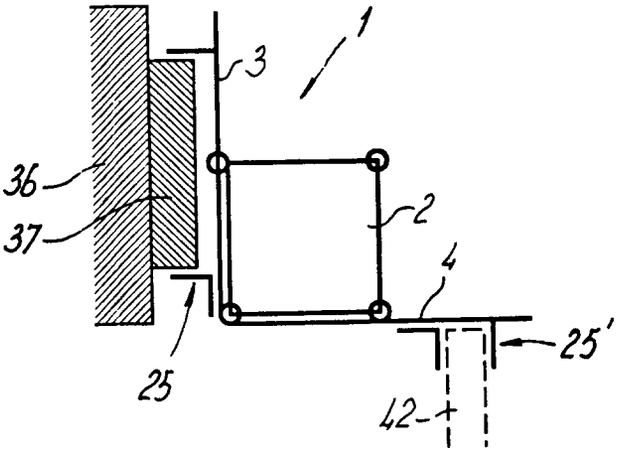


Fig-9

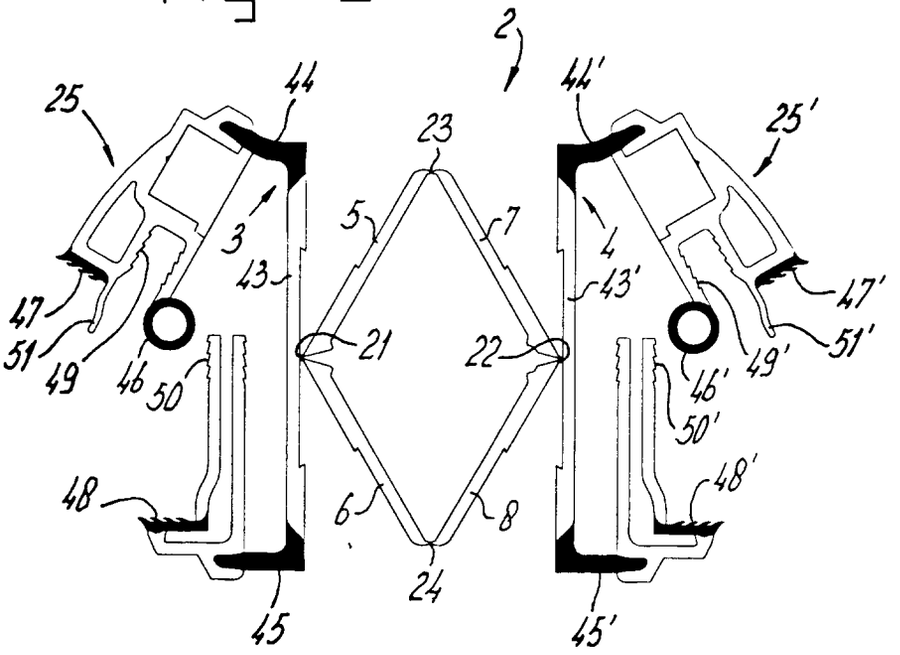


Fig-10

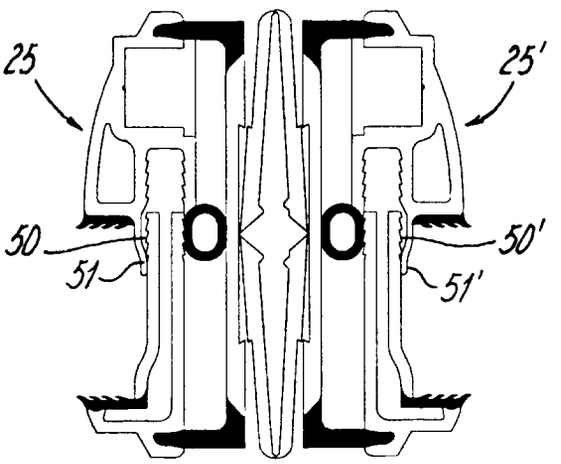


Fig - 11

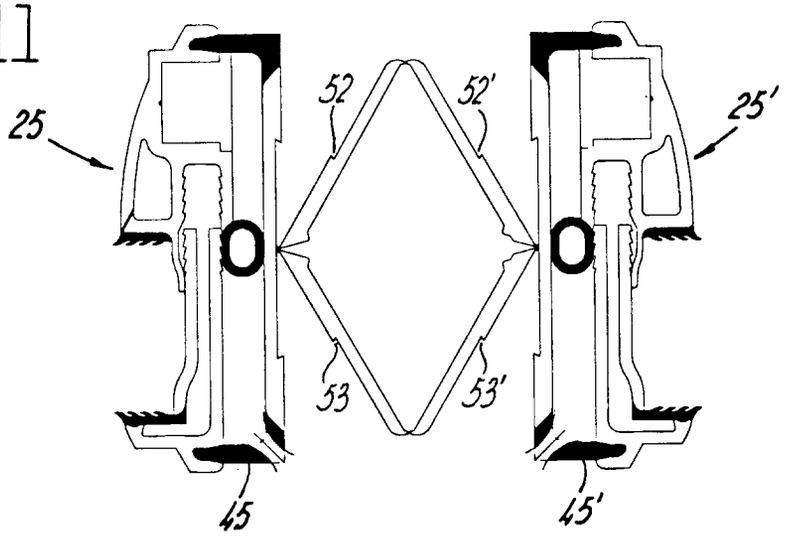


Fig - 12

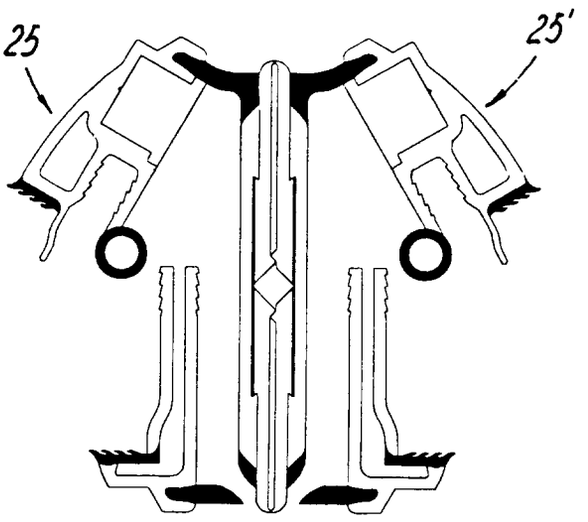


Fig - 13

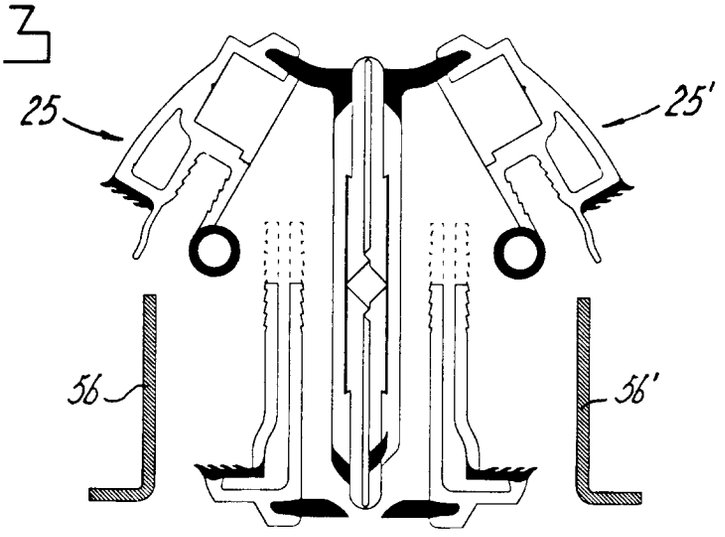


Fig - 14

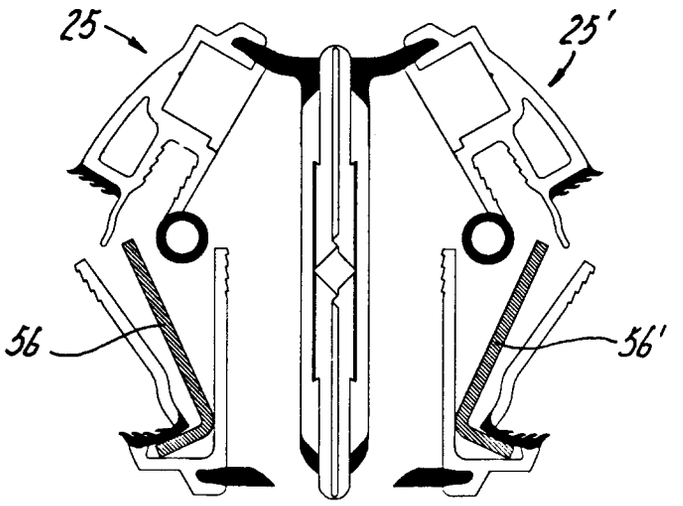


Fig - 15

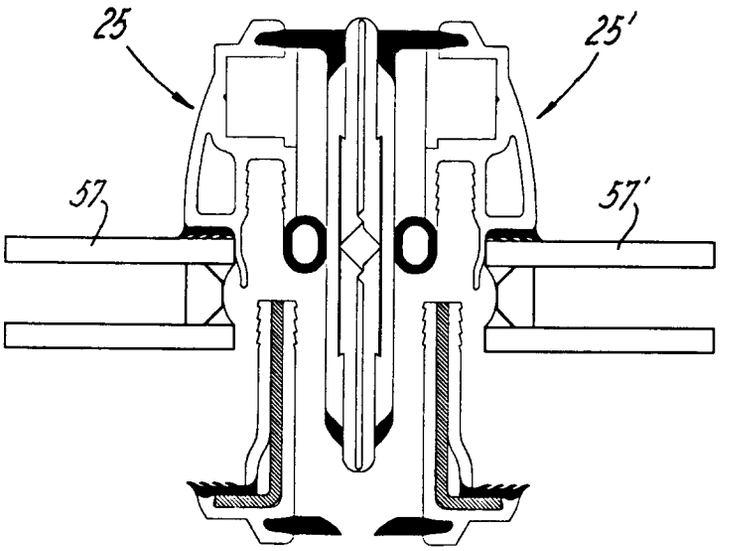


Fig - 16

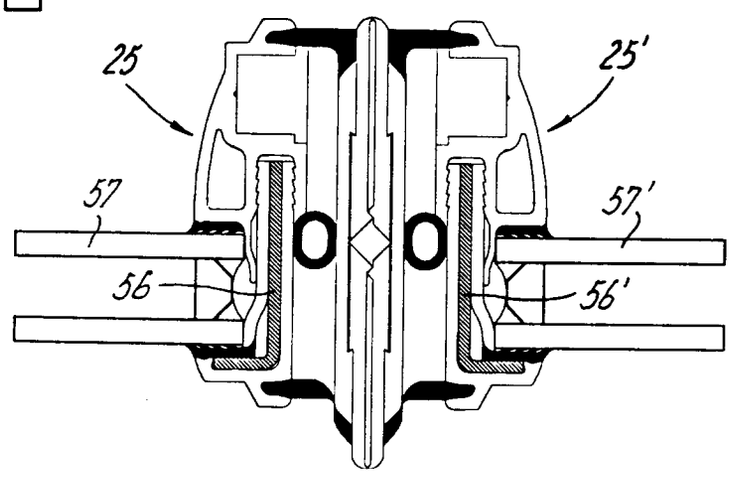


Fig - 17a

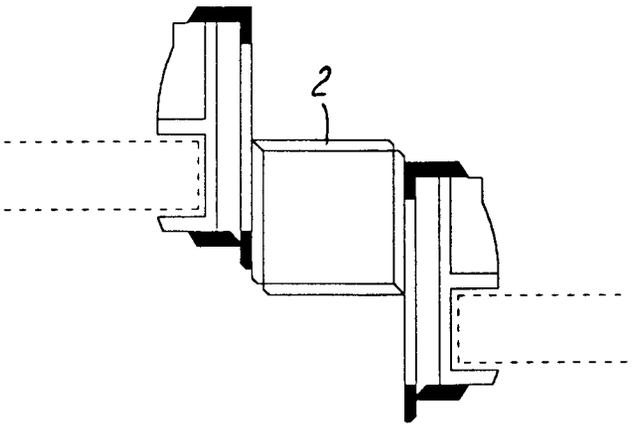


Fig - 17b

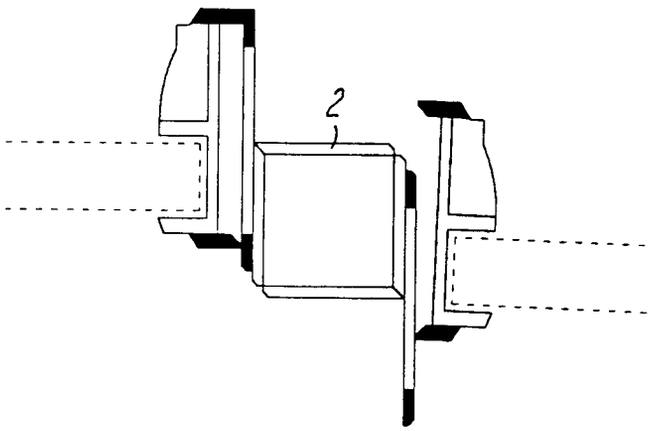


Fig - 18a

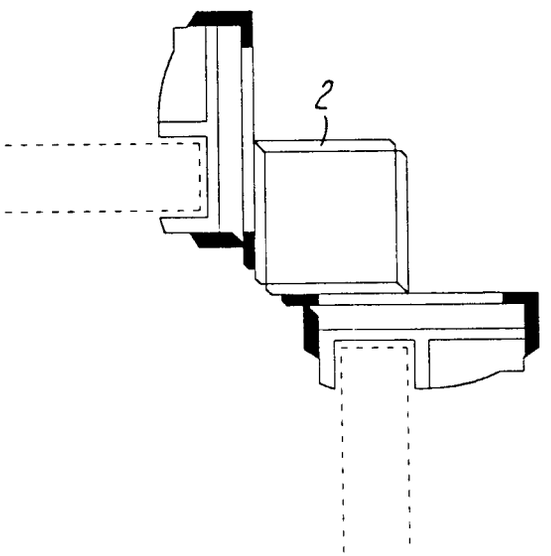


Fig - 18b

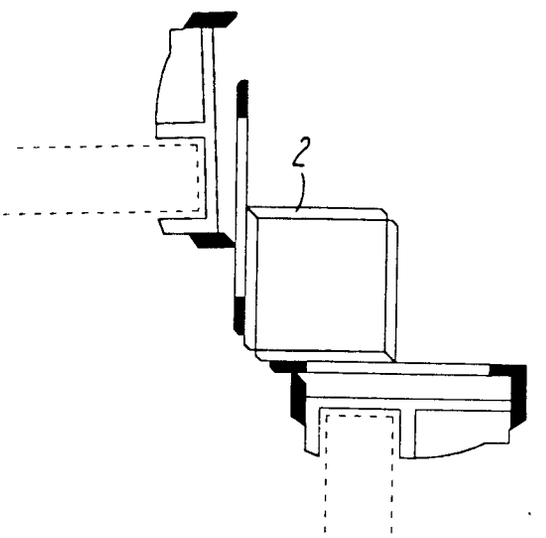
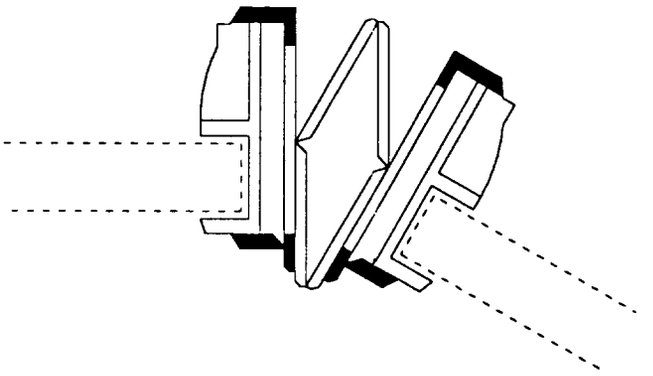


fig-19a



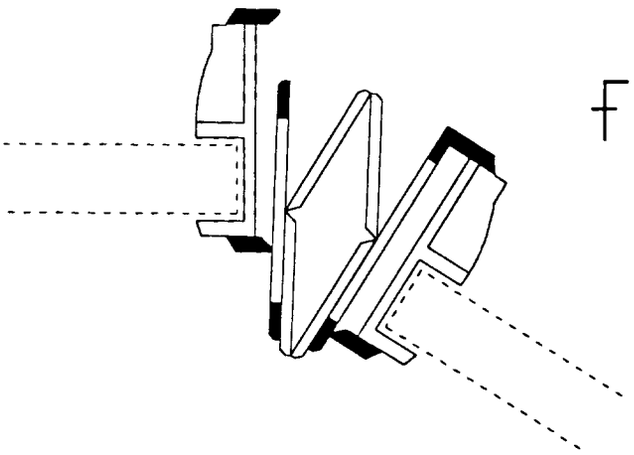
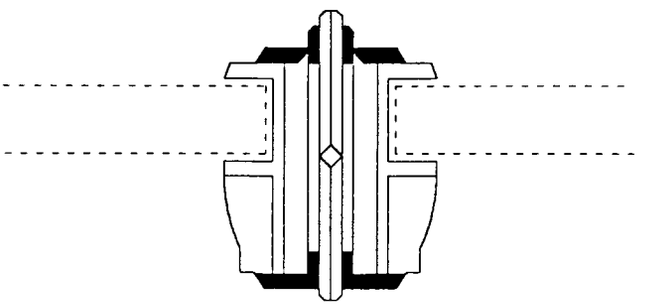


fig-19b

fig-20a



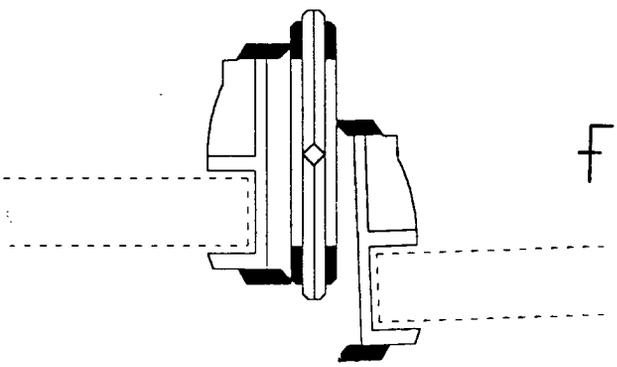


fig-20b

fig-21

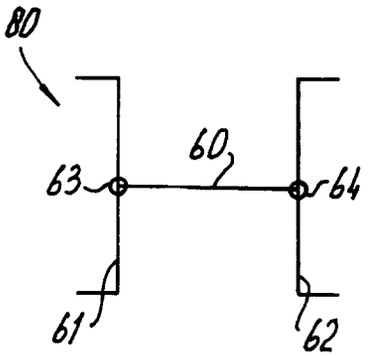


fig-22

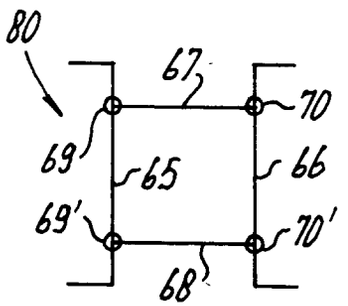
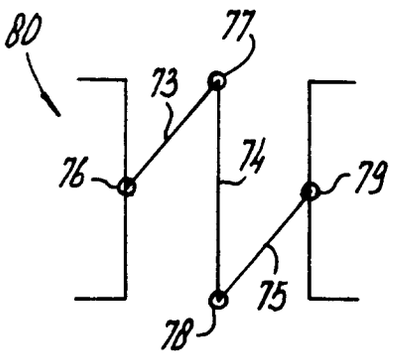


fig-23



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EUROPEAN SEARCH REPORT

Application Number
EP 95 20 2628

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	GB-A-2 247 717 (GUTHRIE) ---	1 11	E05D1/02
X	FR-A-1 365 228 (LAUTENSCHLAGER K.G.) * page 1, left column, line 1 - line 15 * * page 2, left column, line 39-49; figures 1,2 * ---	1,2	
X	US-A-5 115 855 (LINDBLOM ET AL) * column 2, line 14 - line 21 * * column 4, line 4 - line 54; figures 2,3,6 * ---	1,3,5-7	
X	DE-A-40 13 622 (CLIP-LOK INTERNATIONAL LTD) * column 2, line 4 - column 3, line 32; figures 1-5 * ---	1,5,8-10	
Y	FR-A-2 260 682 (YULKOWSKI) * claim 20 * ---	11	
A	US-A-4 799 727 (ROBBINS ET AL) * abstract * ---	8-10	TECHNICAL FIELDS SEARCHED (Int.Cl.6) E05D
A	FR-A-2 656 387 (RODITI) * abstract * * page 2; figure 4 * ---	1	
A	FR-A-2 347 513 (BREEDVELD INTERIEURWERKEN B.V.) * page 3, line 31 - line 34; figure 4 * -----	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 February 1996	Van Kessel, J

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