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(54) Hinged wall access panel

(57) A pivot assembly comprising a base portion and first and second hinge elements, said hinge elements being pivotally connected, in use, to said base portion by first and second ball and socket joints respectively.

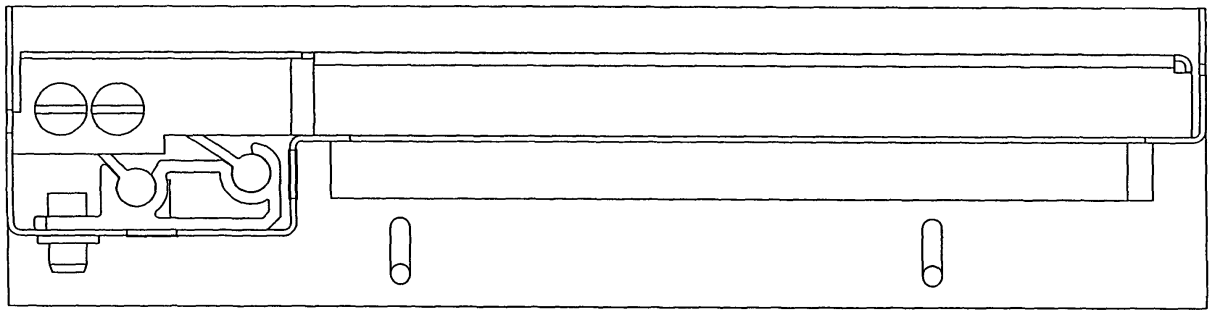

FIG 1

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Description

Field of the Invention

[0001] The present invention relates to a method and apparatus for effecting relative pivotal movement between two components. It is particularly applicable, but in no way limited, to pivotally mounted access covers where a closure member is pivotally mounted to a frame.

Background to the Invention

[0002] Hinged wall mounted access panels of various types are used extensively in commercial premises. One typical application is in toilets or washrooms where a hinged panel, tiled on its outer surface to match the surrounding area, is used to provide easy access to concealed plumbing. However, known access panels of this type suffer from a number of disadvantages. For example, they are relatively expensive to manufacture and are often made from aluminium or plastic. As a result they cannot easily be upgraded to provide versions with a satisfactory fire rating. Nor can they be manufactured cheaply enough for the domestic market where there are many situations where they could be used, such as to provide access under baths.

[0003] It is therefore an objection of the present invention to overcome or mitigate some or all of the above problems.

Summary of the Invention

[0004] According to a first aspect of the present invention there is provided a pivot assembly comprising a base portion and first and second hinge elements, said hinge elements being pivotally connected, in use, to said base portion by first and second ball and socket joints respectively. This two-link double pivot assembly provides a cost-effective system for hinging a door.

[0005] Preferably the hinge elements each incorporate a pivotal connection means at an edge or side of the hinge element opposite to the ball/socket joint with the base portion. This facilitates connecting the pivot assembly to a door.

[0006] Preferably the first and second hinge elements are aligned in use in substantially parallel, non-coaxial, corresponding end alignment.

[0007] In a particularly preferred embodiment the base portion is formed as an extruded length. This extrusion is particularly cost-effective to produce and can be cut to any length when doors or cover assemblies are made to order.

[0008] Preferably the first and/or second hinged elements are also formed as an extruded length.

[0009] In a particularly preferred arrangement the pivot assembly comprises:-

(i) a base portion incorporating two sockets;
(ii) a first hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the first hinged element, the ball formation being adapted to nest within one of the sockets in the base portion;
(iii) a second hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the second hinged element, the ball formation being adapted to nest within one of the sockets in the base portion. Having the sockets arranged as substantially cylindrical channels on the base portion simplifies manufacture.

[0010] Preferably when the pivot assembly is in an open configuration, at least one of the hinge elements contacts a bearing surface on the base portion to prevent further rotational movement of the hinge element.

[0011] According to a second aspect of the invention there is provided an access cover assembly comprising a door, an outer frame and a pivot assembly, said pivot assembly comprising a base portion and first and second hinge elements, said hinge elements being pivotally connected, in use, to said base portion by first and second ball and socket joints respectively.

[0012] Preferably the hinge elements each incorporate a pivotal connection means at an edge or side of the hinge element opposite to the ball/socket joint with the base portion.

[0013] Preferably the first and second hinge elements are aligned in use in substantially parallel, non-coaxial, corresponding end alignment.

[0014] In a particularly preferred embodiment the base portion is formed as an extruded length.

[0015] Preferably the first and/or second hinged elements are also formed as an extruded length.

[0016] In a particularly preferred arrangement the pivot assembly comprises:-

(i) a base portion incorporating two sockets;
(ii) a first hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the first hinged element, the ball formation being adapted to nest within one of the sockets in the base portion;
(iii) a second hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the second hinged element, the ball formation being adapted to nest within one of the sockets in the base portion.

[0017] Preferably, when the pivot assembly is in an open configuration, at least one of the hinge elements contacts a bearing surface on the base portion to prevent further rotational movement of the hinge element.

Brief Description of the Drawings

[0018] In order that the present invention may be readily understood, it will now be described by way of example only, with reference to the following drawings in which:-

Figures 1 to 3 illustrate side elevations of an access cover assembly with the access cover or door in closed, partly open and fully open configurations respectively;

Figures 4, 5 and 6 illustrate perspective views of the access cover assembly shown in Figures 1 to 3 in corresponding closed, partly open and fully open configurations;

Figures 7, 8 and 9 illustrate cross-sectional views showing details of a pivot assembly in closed, partly open and fully open configurations;

Figures 10 and 11 show perspective views of extrusions of a base portion and two hinge elements making up the pivot assembly of Figures 7, 8 and 9, the extrusions being of indeterminate length.

Description of the Preferred Embodiments

[0019] Embodiments of the present invention will now be described by way of example only. These examples are the best ways currently known to the applicant of putting the invention into practice, but they are not the only ways in which this could be achieved.

[0020] Referring to Figures 1 to 3, these shown in end elevation an access cover assembly generally shown as 10 according to one embodiment of the invention. The cover assembly comprises a door 11 pivotally connected to an outer frame 12 along one edge of the frame by a pivot assembly generally shown as 13. The pivot assembly is shown in more detail in Figures 7 to 11 inclusive. The outer frame 12 has securing points 14 which enable it to be secured to and set within a surrounding structure, typically a wall or some other surface. That surface need not be vertical and could be horizontal, or indeedat any angle in between.

[0021] The front, or outward facing, face of the door 11 may contain a recessed face 15 which is adapted to take a finishing material such as ceramic tiles, marble, resin, wood or the like. The intention is that the finish on the front of the door should be flush with and matching with the finish on the surrounding surface. This recessed arrangement is shown more clearly in Figure 4.

[0022] The pivot assembly is illustrated in more detail in Figures 7, 8 and 9. The assembly consists of a base portion or plate 20 which has a substantially flat or planar face 21 adapted to be secured to the outer frame. The base portion includes two sockets, a first socket 22 and a second socket 23. These sockets are spaced apart across the width of the base portion. In this context "width" is the dimension 'W' as shown in Figure 7. The first and second sockets are so sized, shaped and configured as to accept balls 24,25 on the side edges of two hinge elements 26 and 27 respectively. The arrangement is such that the hinge elements are spaced apart across the width of the base portion and are aligned, in use, in substantially parallel, non-coaxial corresponding end alignment. That is to say the hinge elements are aligned parallel to and axially spaced apart from each other on the base portion.

[0023] It will be appreciated that, whilst the above arrangement has a socket in the base portion and a ball on the hinge element, it could equally well have been designed with a ball on the base position and a corresponding socket on the hinge element. It is the side-by-side spacing of the ball and socket joint that is important to the operation of the invention.

[0024] During assembly, the region of each hinge element opposite the ball/socket, shown in Figure 7 as regions 28 and 29 are fixed to the top and bottom of the door. In the arrangement illustrated, these regions are shown as a socket that can accommodate a screw, bolt or plug fixing, making the necessary connection between the hinge elements and the door. But this is only one type of fixing which could be used and the most appropriate fixing type will be determined by the materials specialist.

[0025] In this embodiment the hinge elements and the base position are formed as extruded parts and these are shown in Figures 10 and 11. It will be appreciated that the first and second hinge elements 126 and 127 slide into and are held captive by their corresponding sockets in the base position 120. The extrusions are of indeterminate lengths and can be cut to the length required for a particular access cover.

[0026] The cover assembly is generally rectangular in shape and in this context the term "rectangular" has a very broad meaning. It includes a "square" shape and also includes quadrilateral shapes in which the opposing sides need not necessarily be parallel.

[0027] As explained above, the outer frame is adapted to be installed into an aperture in a wall or other surface. A variety of fixing methods are possible such as anchor lugs extending outwardly from the outer frame into the structure of the floor. Alternatively, the outer frame may be secured to the side of the aperture using conventional flanges with screw of bolt fixings.

[0028] The outer frame is typically formed from four lengths of angle joined together at the corners. Typically the outer frame is formed from a metal such as stainless steel or aluminium and the lengths joined by welding or by proprietary mitre fixings. Welding is preferred because of the strength and durability of the finished joint. Materials other than metal can be used if the application requires and materials such as plastics or fibre-filled composites may be employed. The material will be selected by the materials specialist and any material with sufficient strength and durability and acceptable physical appearance, bearing in mind that the top edge of the frame will be visible in the finished installation, can be used.

[0029] The door 11 is formed from an inner rectangular frame 18 closed by a cover frame base 19 and which is

adapted to be tiled or filled with other appropriate filling material to form a cover member which fits closely within the outer frame. The inner rectangular frame is, similar to the outer frame, formed from four lengths of angle.

[0030] In use the door moves between a closed configuration, shown in Figure 4, in which the door is accommodated substantially within the outer frame and an open configuration, shown in Figure 6, in which the door is substantially perpendicular with respect to the outer frame.

[0031] However, in this invention the cover member is pivotally mounted to the outer frame in a novel way. It will be appreciated that, due to the depth of the cover member 11 and the outer frame 12, and the close fit required between the two it is not a simple matter to hinge the two components together. This is because any pivotal movement between the cover member and the outer frame must be such as to provide clearance between the two components. A simple hinge arrangement along the so-called hinged edge 30 of the door would be both unsightly and liable to damage. The aesthetic appearance of these covers is an important factor in the minds of those specifying and purchasing them. Such covers are often placed in public places where they are highly visible. Similarly, a simple pivot between the side walls of the cover member and the outer frame along an axis parallel with and close to the wall of the outer frame but spaced below the upper co-operating edges of the cover and the frame would also not be practical because, whilst the hinge would not be visible, the co-operating edges would bind against each other.

[0032] Instead, a two-link double pivot system has been developed which overcomes these problems. The relative movements of these two links is shown in the opening and closing sequence features in Figures 7 to 9 inclusive. It will be appreciated that the cover member is constrained to move down and away from the top hinged edge of the outer frame as it opens to prevent the edge of the frame and the edge of the cover from binding together.

[0033] Typical access cover sizes are from 300mm x 300mm to 600mm x 900mm. These are given for example only and larger or smaller access covers are possible. A security lock can be provided or a "push pull" catch, to keep the door closed.

Claims

1. A pivot assembly comprising a base portion and first and second hinge elements, said hinge elements being pivotally connected, in use, to said base portion by first and second ball and socket joints respectively.

2. A pivot assembly as claimed in Claim 1 wherein the hinge elements each incorporate a pivotal connection means at an edge or side of the hinge element opposite to the ball/socket joint with the base portion.

3. A pivot assembly as claimed in Claim 1 or Claim 2 wherein the first and second hinge elements are aligned in use in substantially parallel, non-coaxial, corresponding end alignment.

4. A pivot assembly according to any preceding claim wherein the base portion is formed as an extruded length.

5. A pivot assembly according to any preceding claim wherein the first and/or second hinged elements are formed as an extruded length.

6. A pivot assembly as claimed in any preceding claims wherein said pivot assembly comprises:-

   (i) a base portion incorporating two sockets;
   (ii) a first hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the first hinged element, the ball formation being adapted to nest within one of the sockets in the base portion;
   (iii) a second hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the second hinged element, the ball formation being adapted to nest within one of the sockets in the base portion.

7. A pivot assembly according to any preceding claim wherein, when the pivot assembly is in an open configuration, at least one of the hinge elements contacts a bearing surface on the base portion to prevent further rotational movement of the hinge element.

8. An access cover assembly comprising a door, an outer frame and a pivot assembly, said pivot assembly comprising a base portion and first and second hinge elements, said hinge elements being pivotally connected, in use, to said base portion by first and second ball and socket joints respectively.

9. An access cover assembly as claimed in Claim 8 wherein the hinge elements each incorporate a pivotal connection means at an edge or side of the hinge element opposite to the ball/socket joint with the base portion.

10. An access cover assembly as claimed in Claim 8 or Claim 9 wherein the first and second hinge elements are aligned in use in substantially parallel, non-coaxial, corresponding end alignment.

11. An access cover assembly as claimed in any of Claims 8 to 10 inclusive wherein the base portion is

formed as an extruded length.

12. An Access cover assembly as claimed in any of Claims 8 to 11 inclusive wherein the first and/or second hinged elements are formed as an extruded length.

13. An access cover assembly as claimed in any of Claims 8 to 12 inclusive wherein said pivot assembly comprises:-

(i) a base portion incorporating two sockets;
(ii) a first hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the first hinged element, the ball formation being adapted to nest within one of the sockets in the base portion;
(iii) a second hinge element having a ball formation and a socket formation, the ball and socket formations being disposed on opposite edges of the second hinged element, the ball formation being adapted to nest within one of the sockets in the base portion.

14. An access cover assembly as claimed in any of Claims 8 to 13 inclusive wherein, when the pivot assembly is in an open configuration, at least one of the hinge elements contacts a bearing surface on the base portion to prevent further rotational movement of the hinge element.

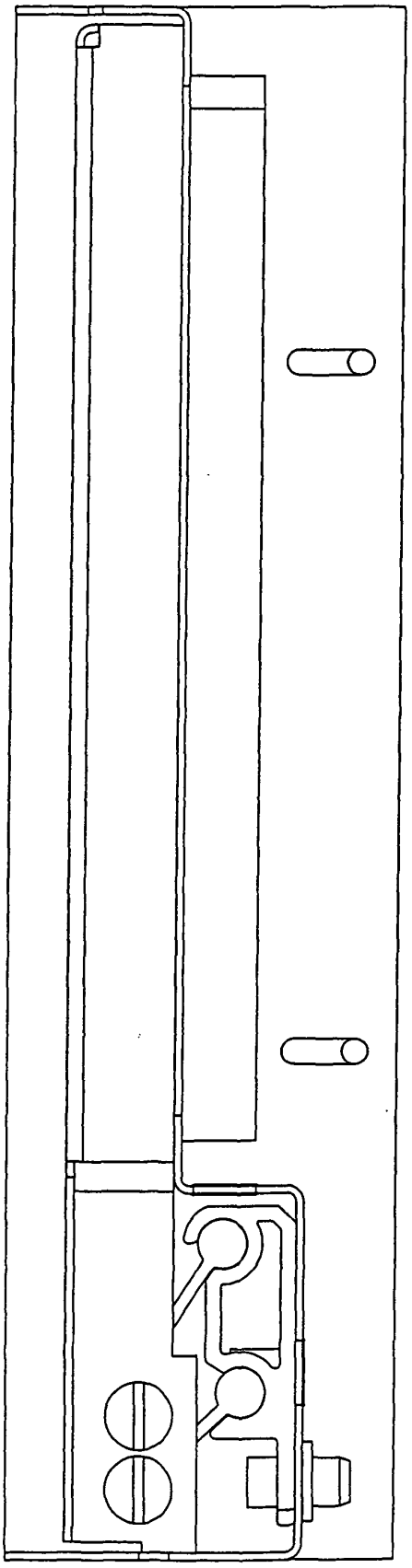


FIG 1

FIG 2

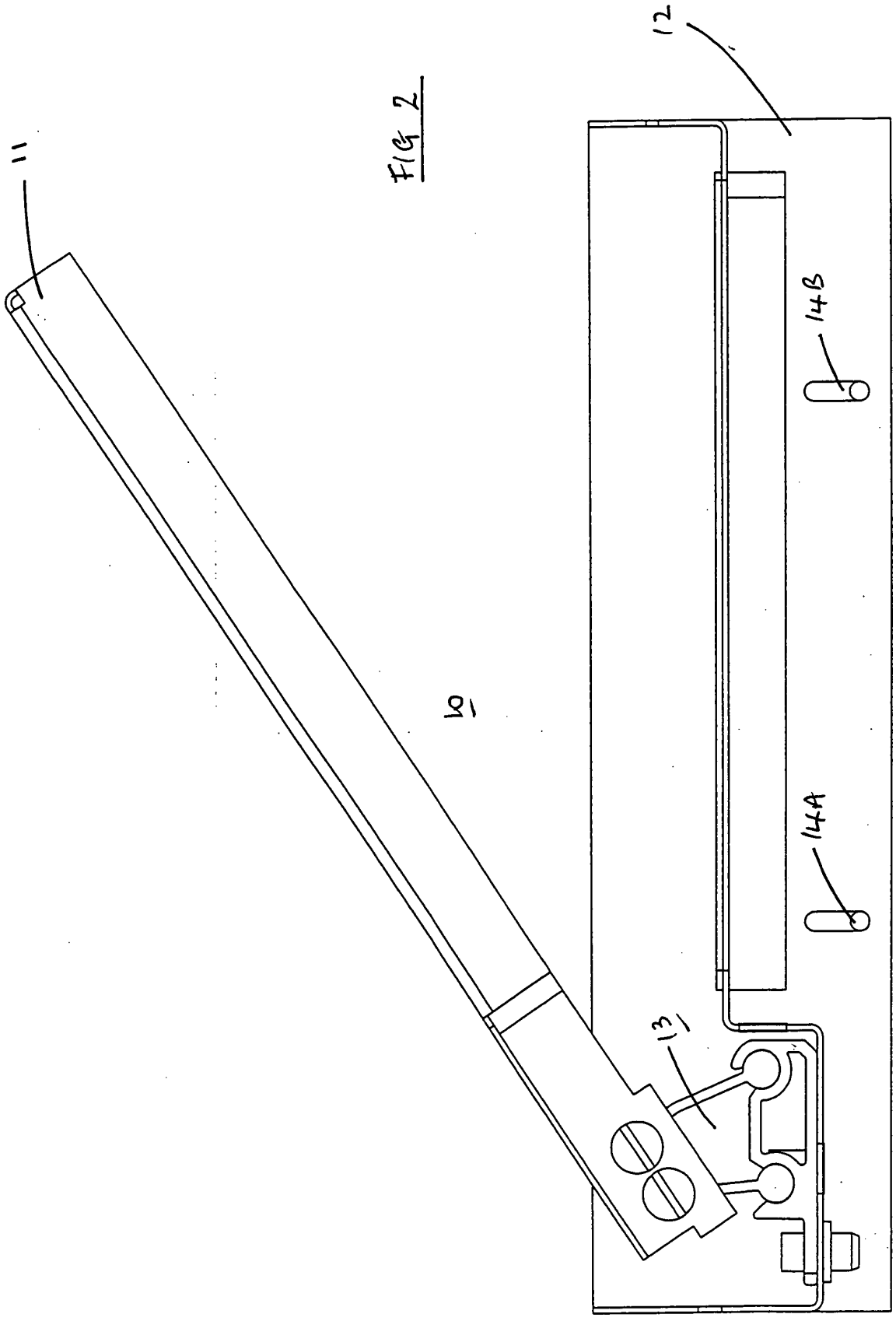


Fig 3

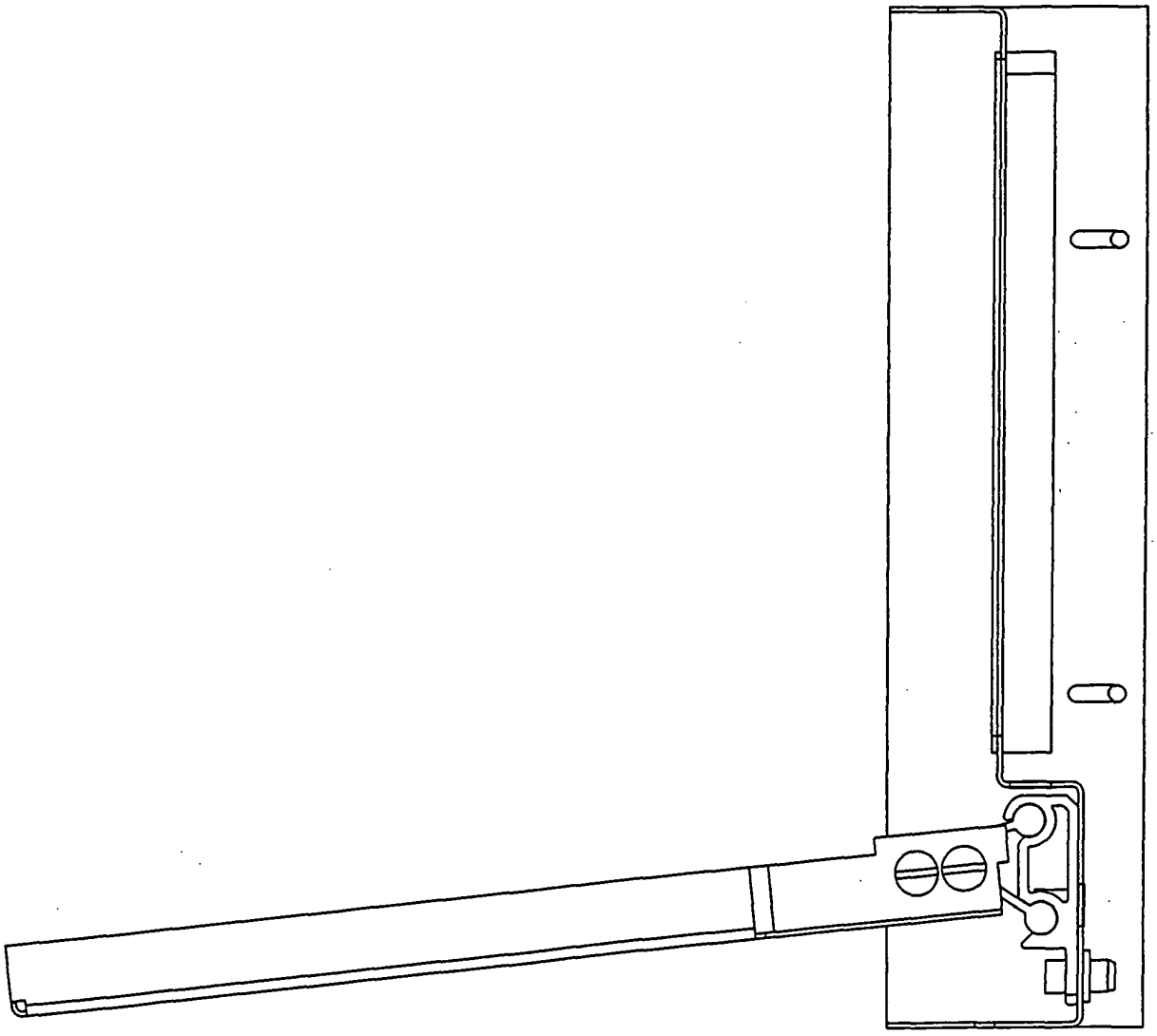


Fig 4

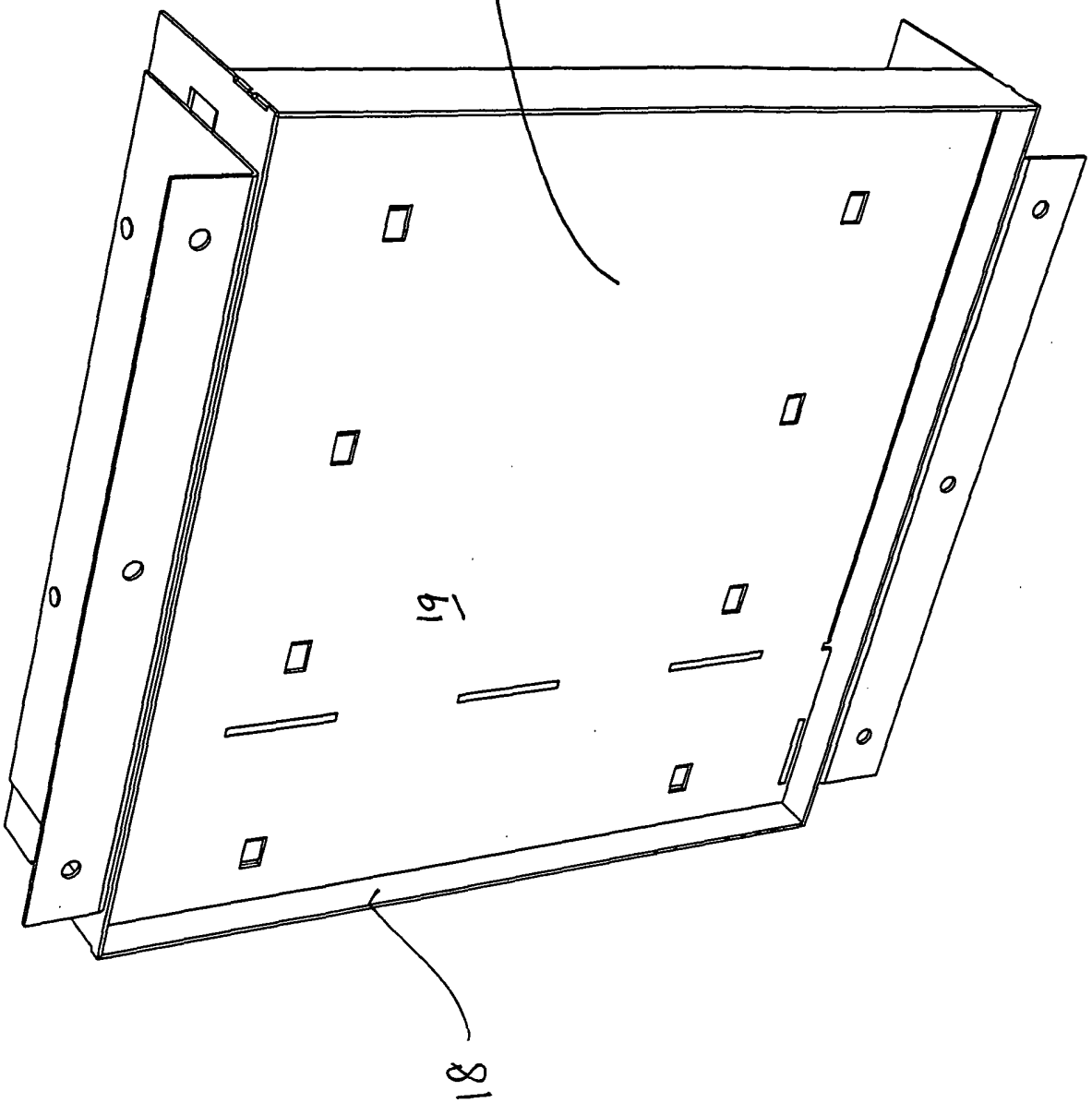


FIG 5

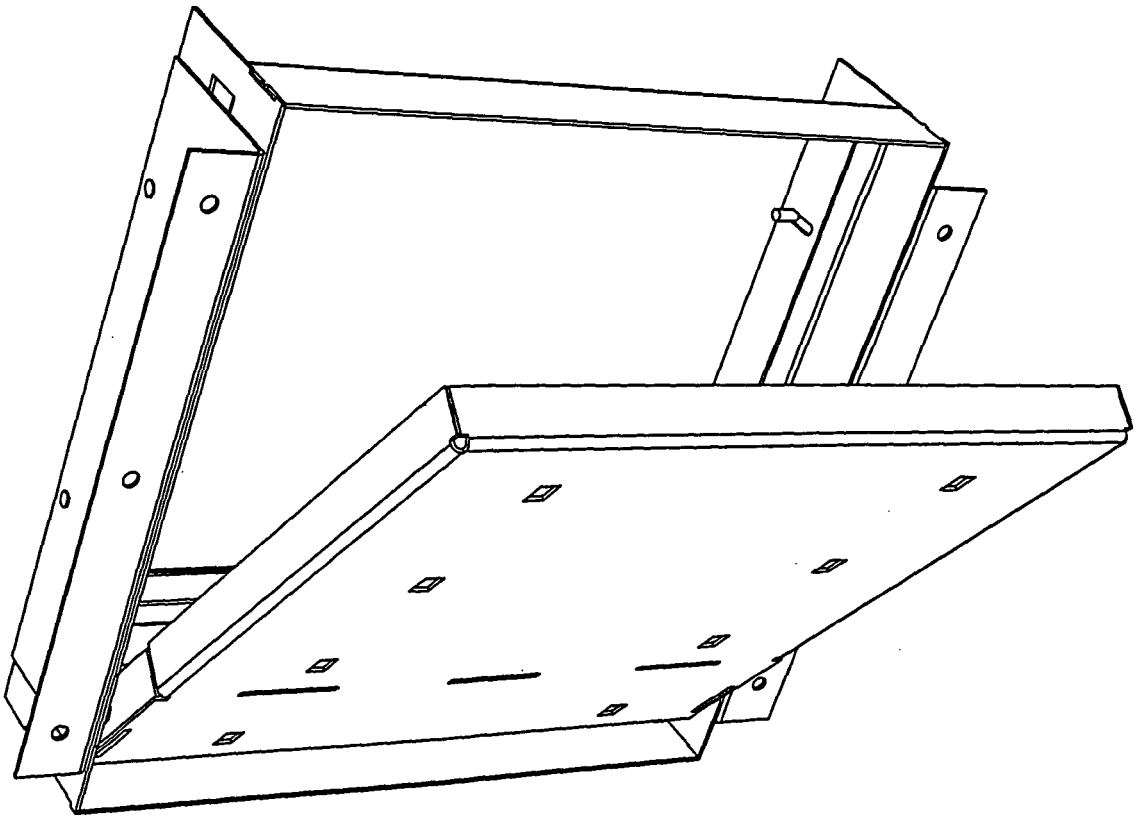


FIG 6

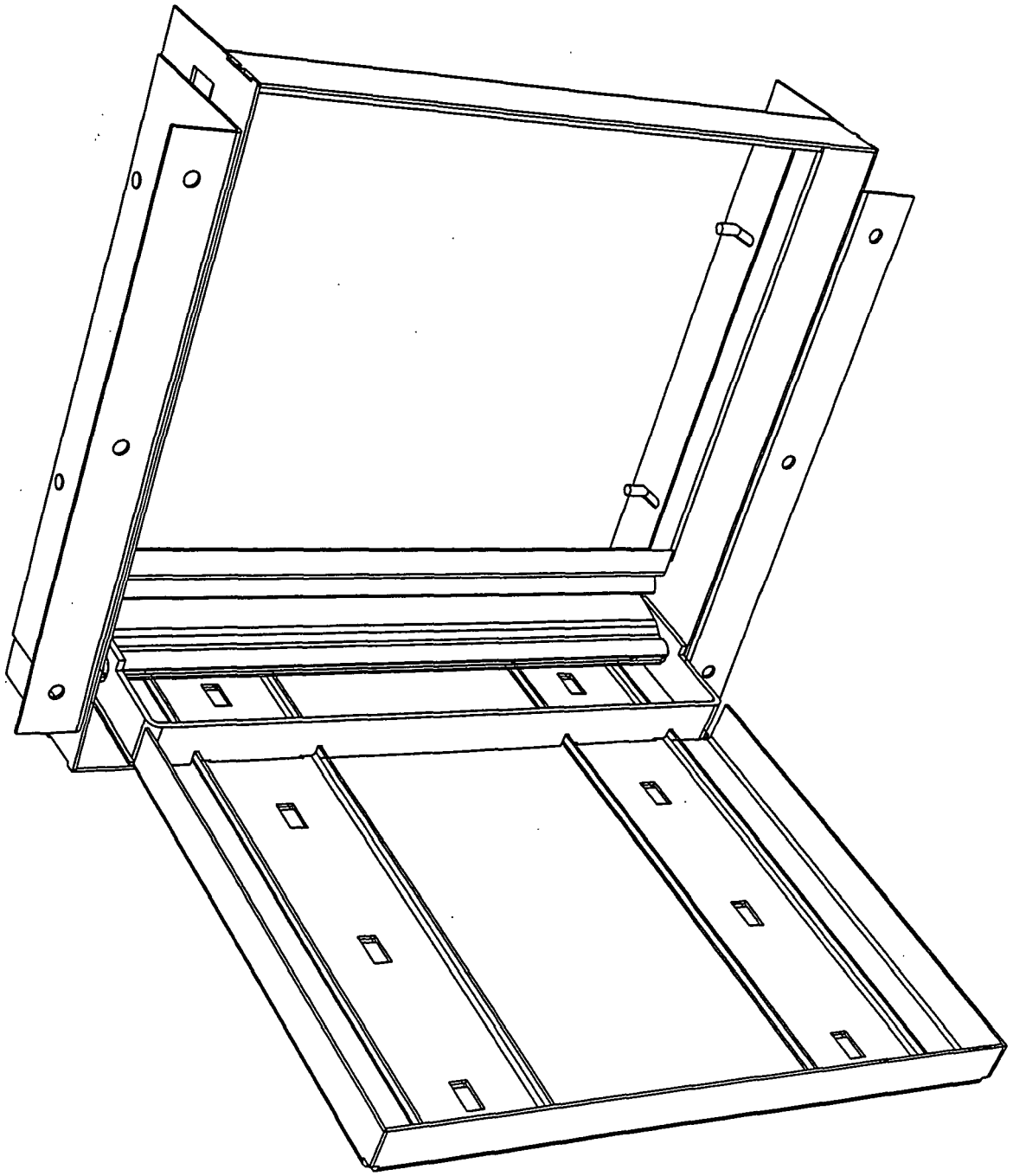


FIG 1

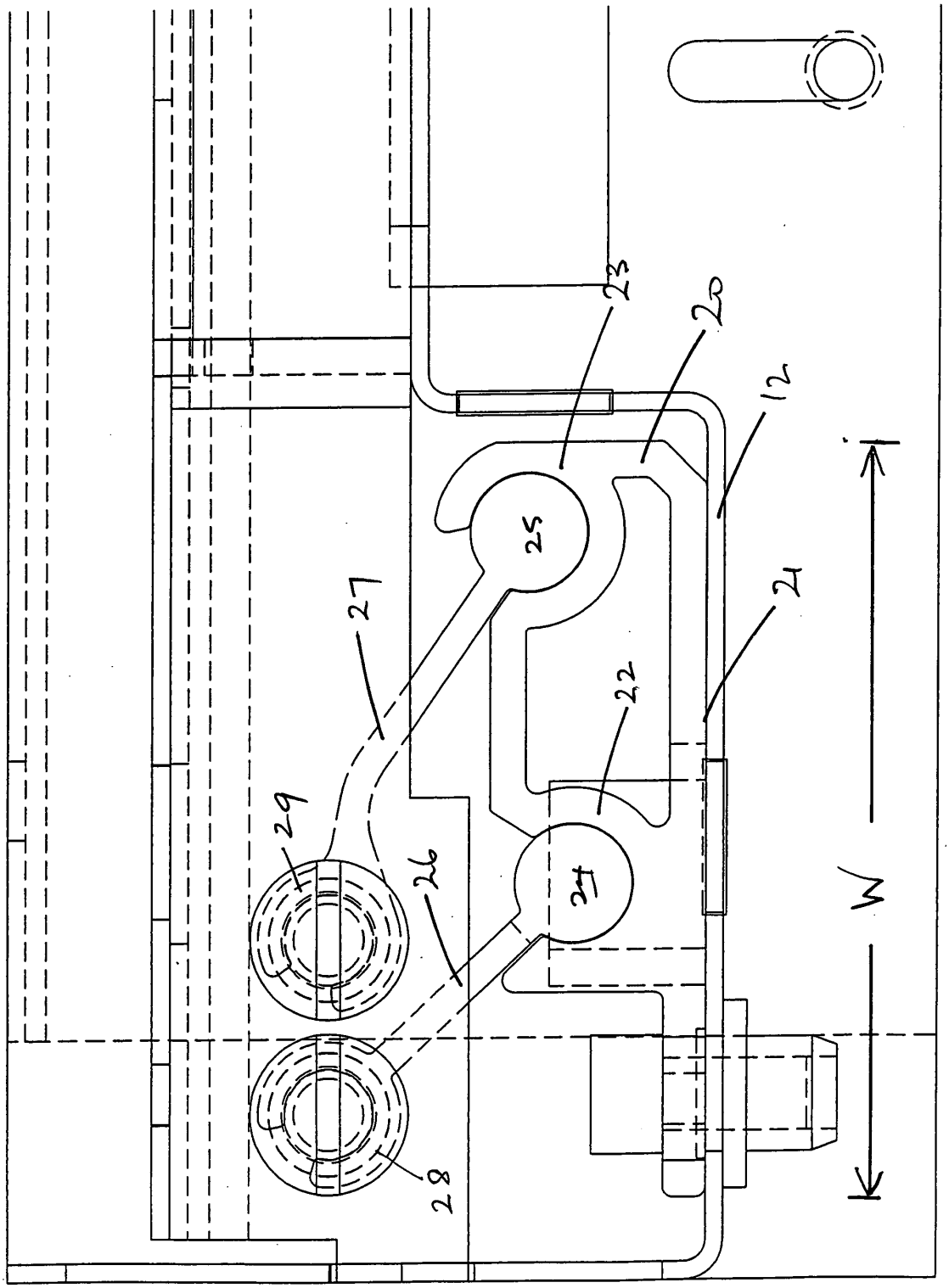


FIG 8

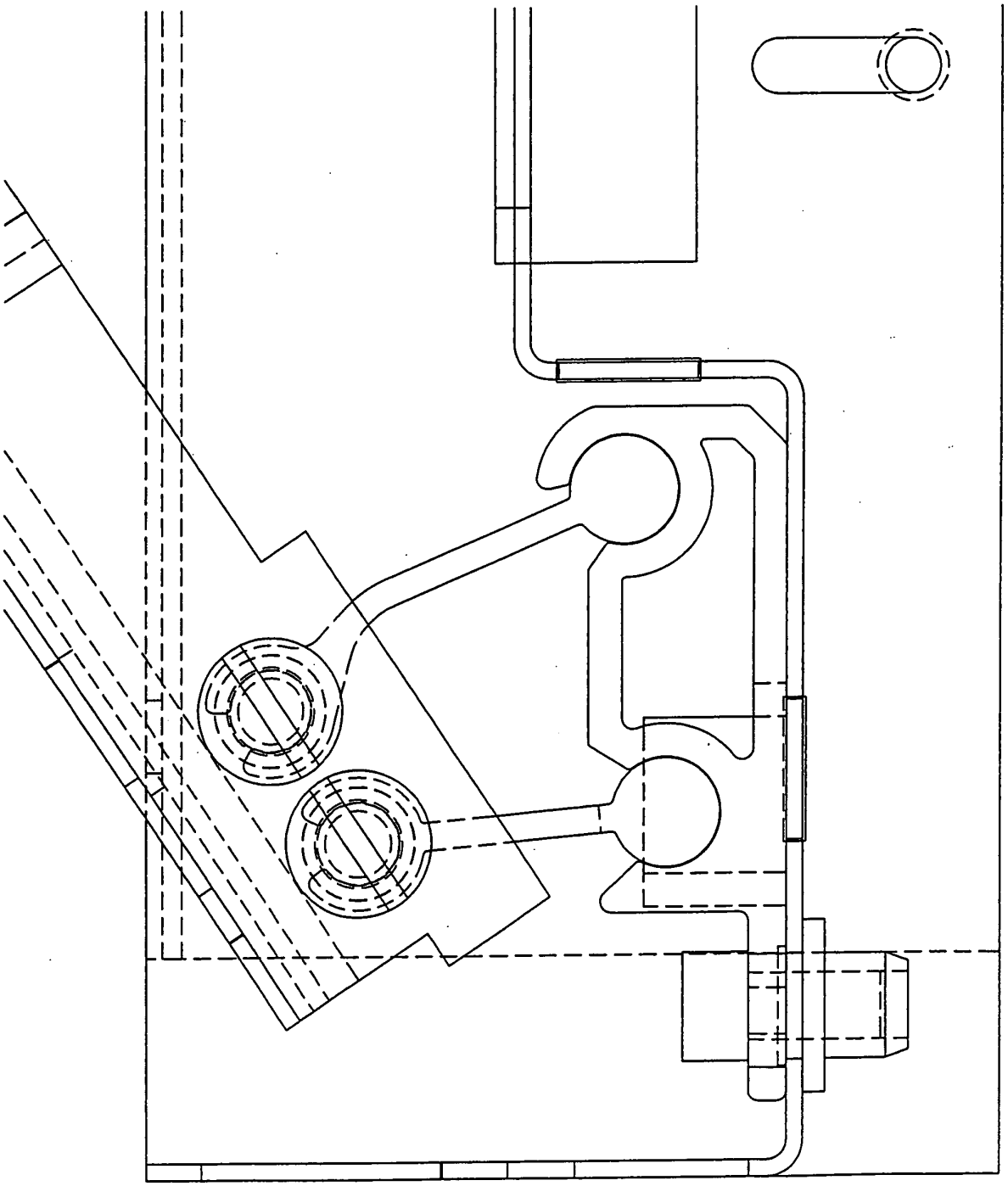


Fig 9

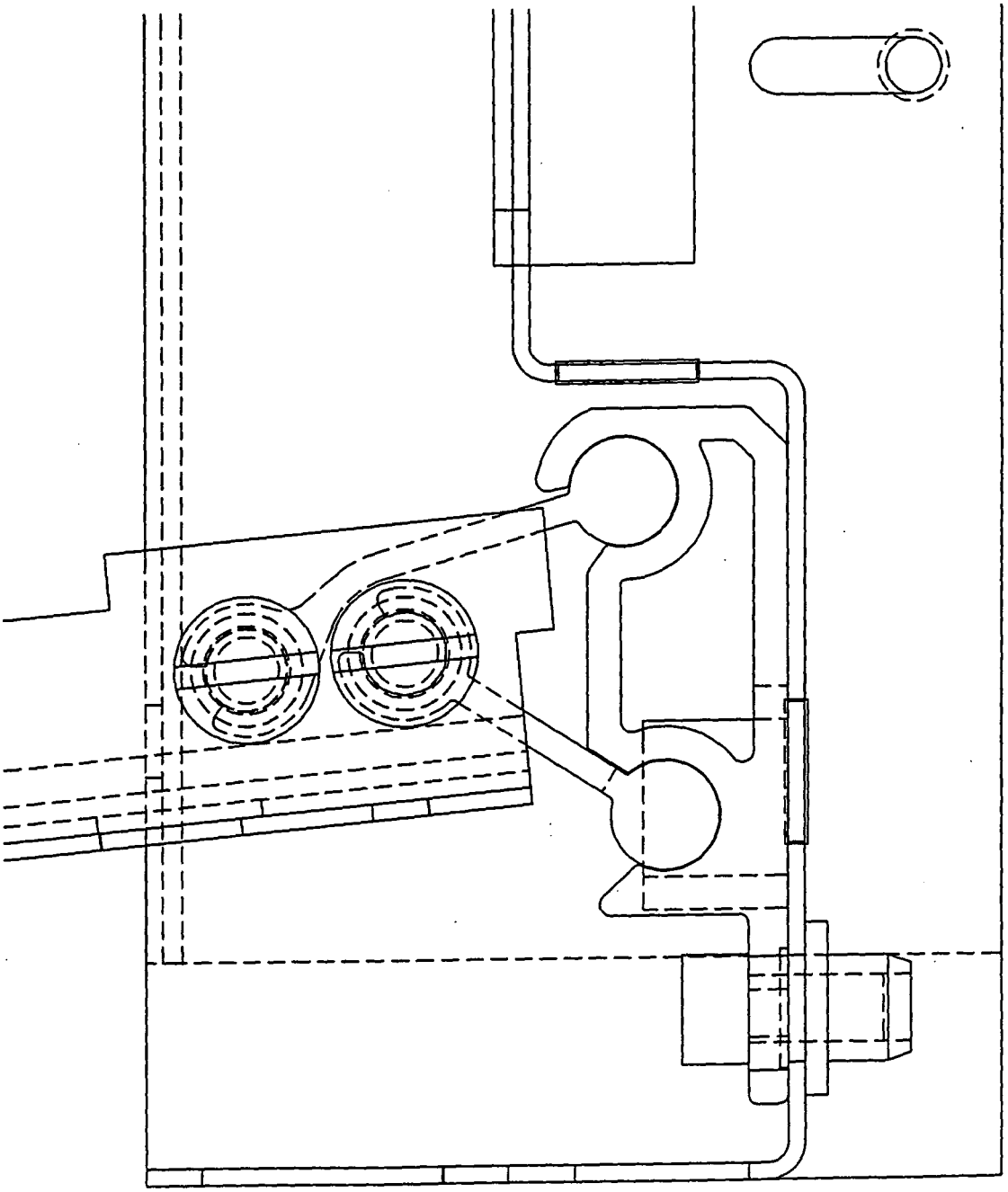
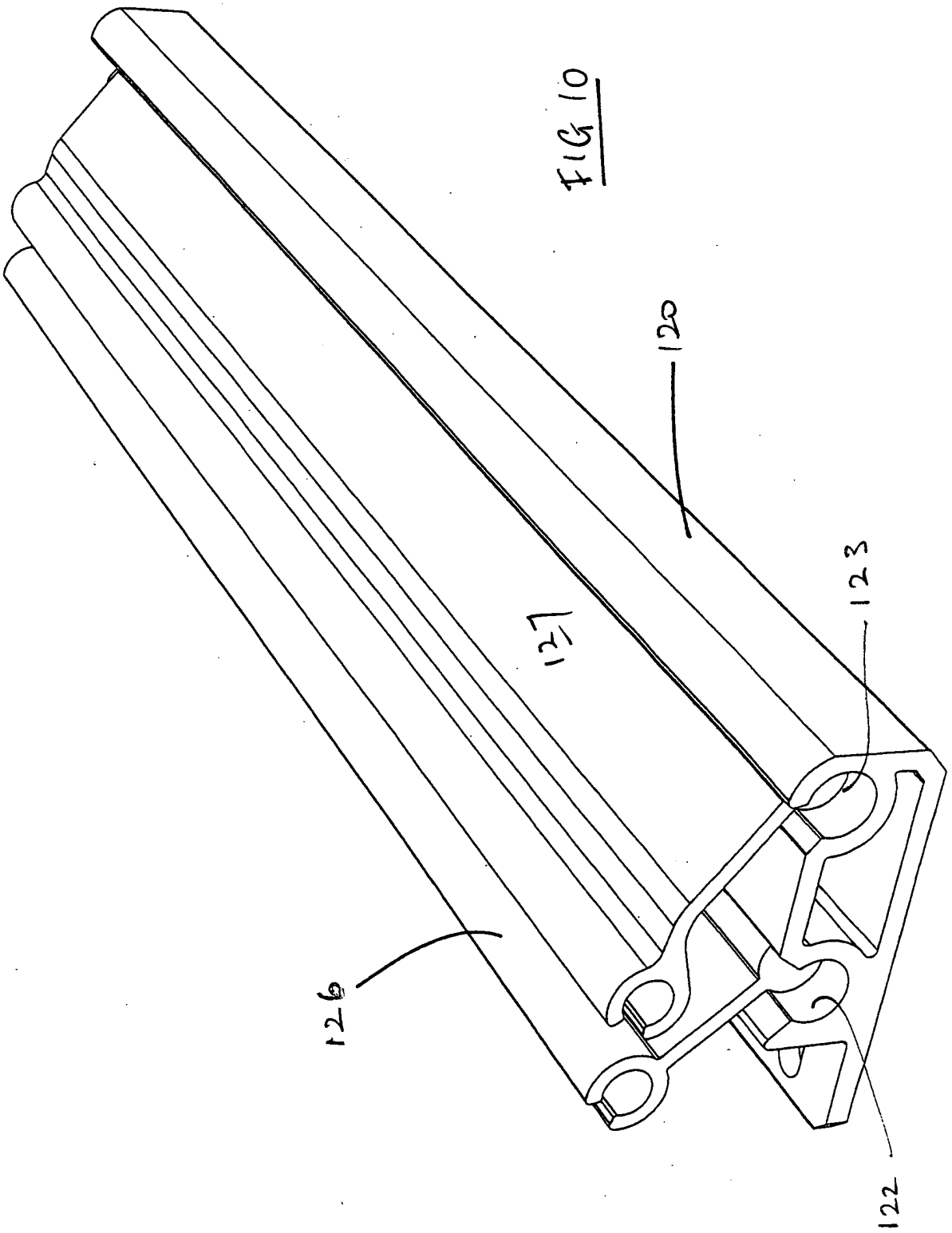


FIG 10



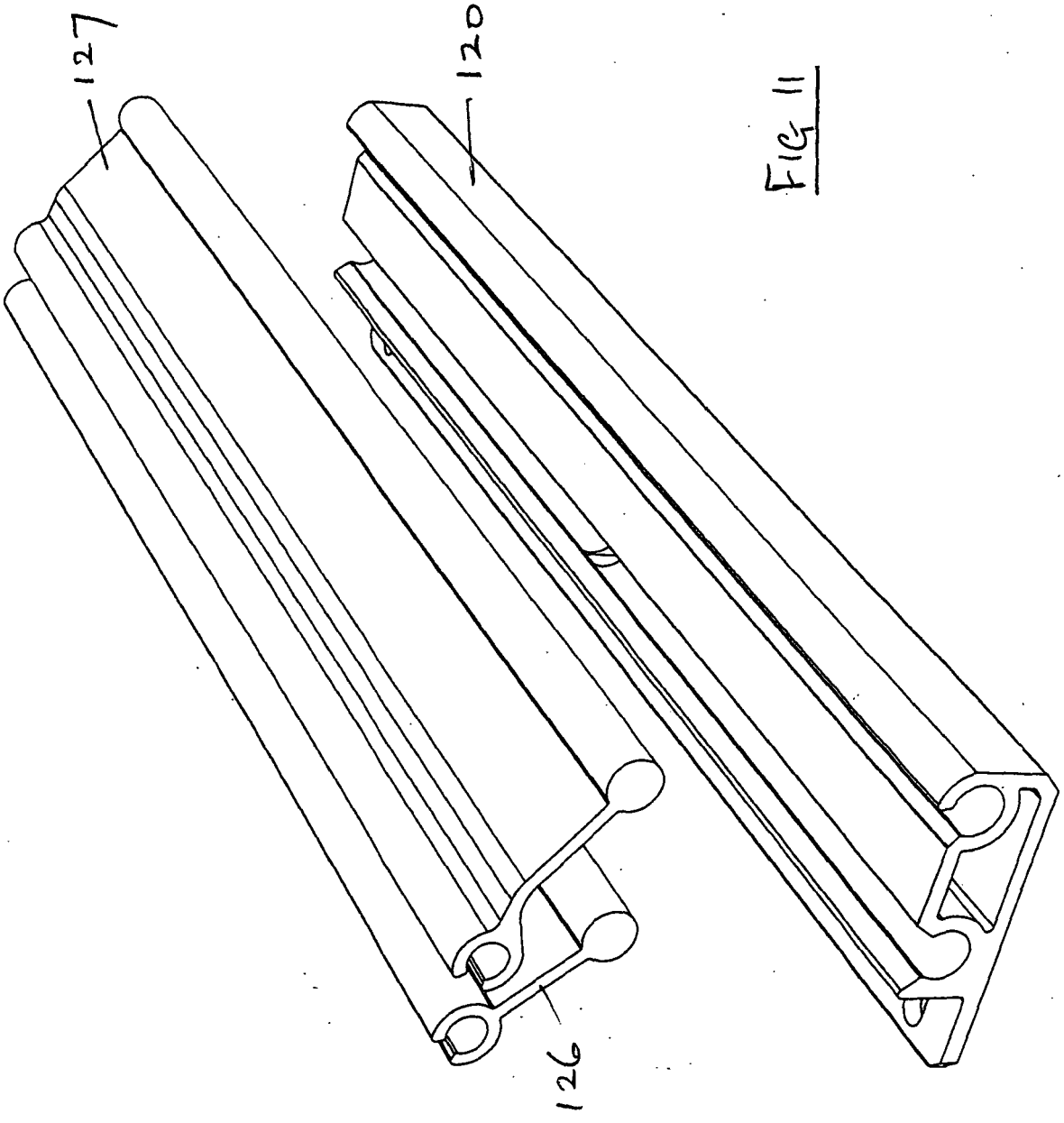


FIG 11