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(54) Clamping bracket for coupling two profiled sections

(57) Clamping bracket for coupling two profiled sections (24, 35), comprising an elongate, rigid coupling piece (2), an elongate, resilient coupling piece (3), which is parallel to the rigid coupling piece (2) and comprises a flexible plate part (14), and a connecting member (4) which is arranged between the plate part and the rigid coupling piece (2) and allows the coupling pieces (2, 3) to rotate with respect to one another about an axis (5) which is perpendicular to their main surfaces, the resil-

ient coupling piece (3) having two end parts (12), which are fixed with a distance between them which is shorter than a length of the plate part (14) and which hold the ends of the plate part in place, so that the plate part (14) is bent, and the coupling pieces (2, 3) are adapted to be received in spaces in the profiled sections with openings facing one another, and the bent shape of the plate part (14) is reversed when the profiled sections are moved towards or away from one another.

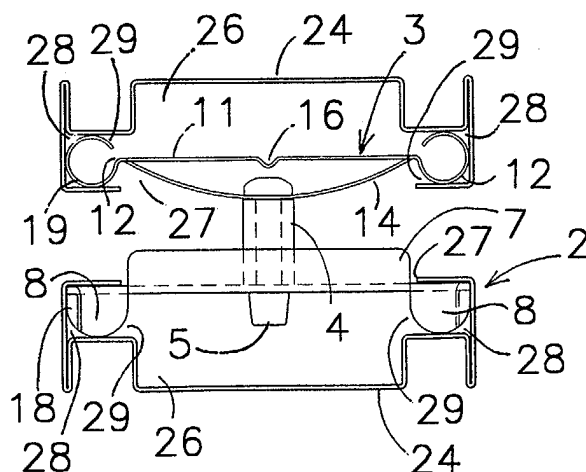


Fig 5

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Description

[0001] The invention relates to a clamping bracket for coupling two profiled sections in accordance with the preamble of claim 1. The profiled sections may be profiled sections for different uses, such as door or window frame profiled sections forming parts of walls.

[0002] A clamping bracket of the above type is known from NL-1005216, which corresponds to EP-0 857 846, both in the name of the present Applicant. In the known clamping bracket, the resilient coupling piece comprises just one flexible plate part. A profiled section in which the resilient coupling piece is to be arranged has to have relatively narrow passages with mutually facing openings for retaining the ends of the plate part. The distance between the bases of these passages must be shorter than the length of the plate part between its said ends. As a result, the plate part, after it has been arranged in the passages, is forced to adopt a curved shape. On account of the fact that the plate part is flexible, it can be bent back and forth from a convex shape into a concave shape and vice versa, as seen from the side of the rigid coupling piece, specifically when the profiled sections are moved towards and away from one another, respectively.

[0003] The known clamping bracket has the drawback that for it to function successfully, it imposes demands on the profiled sections which cannot always be satisfied. For example, profiled sections which would be suitable for coupling using a clamping bracket of this type are not always provided with the abovementioned passages. Furthermore, the passages may be susceptible to damage from end edges of the flexible plate part during displacement of the profiled sections with respect to one another, which in some situations manifests itself by undesirable deformation of the surface on a visible side of the profiled section having the passages. Deformation of this nature may be more serious if the profiled section consists of thin plate material, in which case the bent, stressed plate part of the resilient coupling piece locally pushes parts of the profiled section having the passages apart.

[0004] Therefore, it is an object of the invention to provide an improved clamping bracket for coupling two profiled sections which does not have the drawbacks described above.

[0005] To this end, the invention provides a clamping bracket for coupling two profiled sections as described in claim 1.

[0006] According to the invention, the clamping bracket is in terms of its forces a single unit, which is to be understood as meaning that the clamping bracket can be used even while the flexible plate part of the resilient coupling piece is only exerting forces on the profiled sections to be coupled indirectly via the connecting member connected to it and the rigid coupling piece connected to the connecting member. This means that the resilient coupling piece cannot cause any deformation of the pro-

filed section in which it is arranged and can be used in profiled sections in which spaces which are to accommodate the resilient coupling piece may have a transverse dimension of the space, i.e. a dimension parallel to the longitudinal direction of the coupling pieces after a coupling has been implemented, which is greater than the length of the resilient coupling piece without any drawbacks.

[0007] The fact that the clamping bracket forms a single unit in terms of forces can be implemented in various ways, for example by using a frame of which two opposite inner sides have recesses for retaining the plate part in a curved form. Furthermore, the plate part and a frame of this nature may form an integral component.

[0008] Further embodiments of the clamping bracket according to the invention are described in the dependent claims.

[0009] Further properties and advantages of the invention will be explained in conjunction with the appended drawings, in which:

Fig. 1 shows a perspective view of a first embodiment of a clamping bracket according to the invention;

Fig. 2 shows a plan view of the clamping bracket shown in Fig. 1;

Fig. 3 shows a front view of the clamping bracket shown in Fig. 1;

Fig. 4 shows a side view of the clamping bracket shown in Fig. 1;

Fig. 5 shows a first position of use of the clamping bracket shown in Fig. 1 for coupling two profiled sections;

Fig. 6 shows a second position of use of the clamping bracket for coupling the profiled sections shown in Fig. 5;

Fig. 7 shows a perspective view of a second embodiment of the clamping bracket according to the invention;

Fig. 8 shows a first position of use of the clamping bracket shown in Fig. 7 for coupling two profiled sections;

Fig. 9 shows a second position of the clamping bracket shown in Fig. 7 for coupling the two profiled sections shown in Fig. 8;

Fig. 10 shows a perspective view of a third embodiment of the clamping bracket according to the invention;

Fig. 11 shows a first position of use of the clamping bracket shown in Fig. 10 for coupling two profiled sections;

Fig. 12 shows a second position of the clamping bracket shown in Fig. 1, for coupling the profiled sections shown in Fig. 11;

Fig. 13 shows a perspective view of a fourth embodiment of a clamping bracket according to the invention;

Fig. 14 shows a plan view of the clamping bracket

shown in Fig. 13; and

Fig. 15 shows a perspective view of a fifth embodiment of the clamping bracket according to the invention.

[0010] Fig. 1 shows a first embodiment of the clamping bracket according to the invention. The clamping bracket comprises an elongate, rigid coupling piece 2, an elongate, resilient coupling piece 3 and a connecting member 4 which connects the coupling pieces 2 and 3 to one another. The connecting member 4 has an axis 5 which is perpendicular to main surfaces of the coupling pieces 2 and 3 and about which the coupling pieces 2 and 3 can rotate with respect to one another.

[0011] Facing the resilient coupling piece 3, the rigid coupling piece 2 has stop sections 7 which are suitable for a tool piece to engage on in order to rotate the rigid coupling piece 2 with respect to the resilient coupling piece 3.

[0012] At its ends, the rigid coupling piece 2 has lugs 8 which are directed perpendicular to the main surfaces of the rigid coupling piece 2 and fulfil the function of filler means or filler pieces in order to make the rigid coupling piece 2 substantially non-displaceable in a direction parallel to the axis 5 after it has been arranged in a profiled section.

[0013] The resilient coupling piece 3 comprises a rigid frame composed of two long opposite side parts 11 and two short opposite side parts 12. The frame comprising the side parts 11, 12 surrounds a flexible plate part 14, the material of which, at its ends, merges into the material of the short side parts 12, so that the frame and the plate part 14 are integral.

[0014] The length of the plate part 14 is greater than the distance between the short side parts 12 of the said frame, so that the plate part 14 adopts a curved shape. The plate part 14 is flexible, with the result that, in a direction parallel to the axis 5 and as seen from the rigid coupling piece 2, it can be bent out of the convex shape shown, flexibly past the long side parts 11 of the frame, into a concave shape, and back again.

[0015] The resilient coupling piece 3 shown in Fig. 1 can be made from a single piece of plate. After incisions have been made to form the said long side parts 11 and the plate part 14, it is possible to form the short side parts 12, for example in the form of cylinders. The local formation of indentations 16 of a suitable depth in the long side parts 11 of the frame shortens the side parts 11 with respect to the length of the plate part 14 located between them, so that the plate part 14 adopts a curved shape.

[0016] Preferably at least two ends, lying on a diagonal of the coupling piece at 18 and 19, respectively, of each of the coupling pieces 2, 3 are bevelled in order to allow or facilitate rotation of the coupling pieces about the axis 5 when they are positioned in a profiled section.

[0017] Fig. 2, 3 and 4 respectively show a plan view, a front view and a side view of the clamping bracket

shown in Fig. 1, with the flexible plate part 14 in the same position with respect to the surrounding frame having the side parts 11, 12 as that shown in Fig. 1.

[0018] Fig. 5 shows a plan view of two profiled sections 24 which, for example, form part of window frames in a wall. In their longitudinal direction, the profiled sections 24 have a space 26 which has an opening 27 on one side of the profiled section 24. The openings 27 in the two profiled sections 24 face one another. At their sides, the spaces 26 have smaller spaces 28 with openings 29 which face one another.

[0019] The clamping bracket is used in the following way for the profiled sections 24.

[0020] First of all, the resilient coupling piece 3 is arranged in the space 26 in a first one of the profiled sections 24 and is rotated about the axis 5 in such a manner that the short side parts 12 are received, preferably automatically and substantially non-displaceably, in the spaces 28 in the first profiled section 24. With the flexible plate part 14 in the convex position shown, the rigid coupling piece 2 is positioned in the opposite space 26 in the second profiled section 24 at an angle, for example 90°, about the axis 5 with respect to the resilient coupling piece 3. In this situation, the space between the profiled sections 24 is generally too small to move or turn the coupling pieces 2, 3 by hand. Therefore, it is preferable to use a piece of a tool for this purpose, for example a piece of a tool of which one end comprises a suitably curved plate part which can engage on the stop section 7 of the rigid coupling piece 2. With or without the use of a piece of tool of this nature, the rigid coupling piece 2 is rotated in such a manner that its lugs 8 are positioned substantially automatically and non-displaceably in the spaces 28 in the second profiled section 24. Then, the two profiled sections 24 are pushed towards one another, with the result that the flexible plate part 14 is bent out of the convex position, past the long side parts 11 of the frame, into a concave position, so that the situation shown in Fig. 6 is reached. To bend the flexible plate part 14, it is necessary to exert a substantial force, which, given suitable dimensioning of the clamping bracket, can hold the profiled sections 24 clamped securely against one another.

[0021] While the plate part 14 is being bent, the end parts 12 of the frame of the resilient coupling piece 3 can rotate slightly about their longitudinal axis in the spaces 28 in the profiled section 24 in which the coupling piece 3 is arranged. This makes the bending action more flexible and prevents damage to the spaces 28.

[0022] An important characteristic feature of the clamping bracket according to the invention is that the flexible plate part 14 does not in any of the situations shown in Fig. 5 and 6 or while it is being bent into one of these situations, exert substantial forces on side walls of the profiled section 24 in which the resilient coupling piece is arranged. The compressive forces exerted towards the short side parts 12 of the frame by the plate part 14 are compensated for by tensile forces occurring

in the long side parts 11. Therefore, the clamping bracket according to the invention can be described as a clamping bracket which forms a closed unit in terms of forces. In particular if the profiled sections 24, as shown, are made from thin plate material, this prevents the resilient coupling piece 3 from introducing deformations into the profiled section 24 with the resilient coupling piece 3 inside it, which could be visible from the outside of the profiled section 24.

[0023] It will be clear that for it to be possible for the clamping bracket according to the invention to be used, it makes no difference if the spaces 28 are deeper, specifically in the longitudinal direction of the coupling pieces 2, 3, than the form shown in the drawings. Indeed, for practical use it is preferable for the short end parts 12 of the resilient coupling piece 3 to be retained substantially automatically in a non-displaceable manner in the spaces 28. This can be realized by making the dimension of the short end parts 12 parallel to the axis 5 slightly greater than the width of the spaces 28.

[0024] If, in the situation shown in Fig. 5, the profiled sections 24 are moved towards one another by approximately the arc height of the flexible plate part 14, the plate part 14 will tend to bend past the long side parts 11 in order ultimately to reach the situation shown in Fig. 6. This means that it is not necessary for the lugs 8 of the rigid coupling piece 2, parallel to the axis 5, to have a dimension which is equal to the width of the spaces 28, but rather this dimension of the lugs 8 may be shorter by approximately the said arc height of the plate part 14.

[0025] It has been explained above that under certain circumstances it is permissible for the ends of the coupling pieces 2, 3 parallel to the axis 5 to be received with play in spaces in profiled sections. If the play were to be too great for successful use of the clamping bracket, this play can be reduced by the use of lugs 8 and side parts 12 with larger dimensions parallel to the axis 5 than those shown or by the use of one or more filler pieces which extend from rigid sections of the coupling pieces 2, 3 and fill up any excessive play.

[0026] Fig. 7 shows an example of a clamping bracket according to the invention which differs from the clamping bracket shown in Fig. 1 through the fact that a filler piece 34 is arranged on that side of the rigid coupling piece 2 which is remote from the resilient coupling piece 3. The filler piece 34 performs the function of filling or bridging the abovementioned excess play.

[0027] Fig. 8 and 9 show an example of use of the clamping bracket shown in Fig. 7. Fig. 8 and 9 show a plan view of two profiled sections 24, 35 which are, for example, part of a window frame and a door frame, respectively. The profiled section 35 has a space 36 which is too large for the clamping bracket shown in Fig. 1 to fit into, at least with sufficiently little play in terms of the lugs parallel to the axis 5 for it to be possible for the flexible plate part 14 to be bent so as to face the other way when the profiled sections 24, 35 are moved towards one another. This problem is solved by virtue of

the fact that the filler piece 34 of the clamping bracket shown in Fig. 7 fills the space between the remainder of the rigid coupling part 32 and the base 37 of the space 36.

[0028] It may also be desirable or necessary for the resilient coupling piece 3 to be provided with means which substantially bridge any excess play inside a profiled section in which it is or has been arranged.

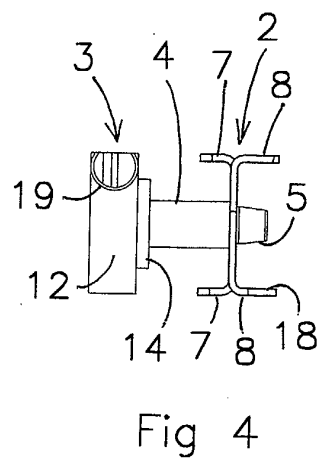
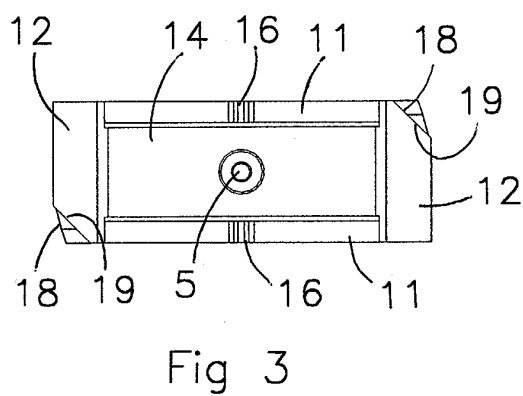
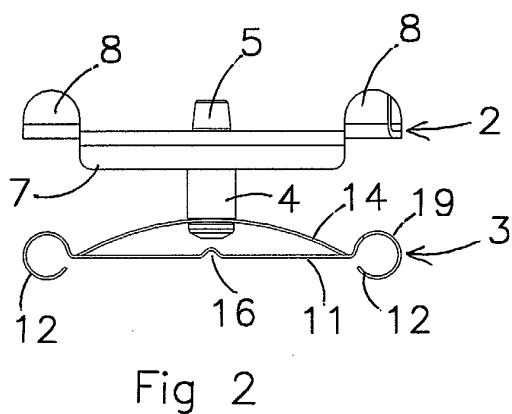
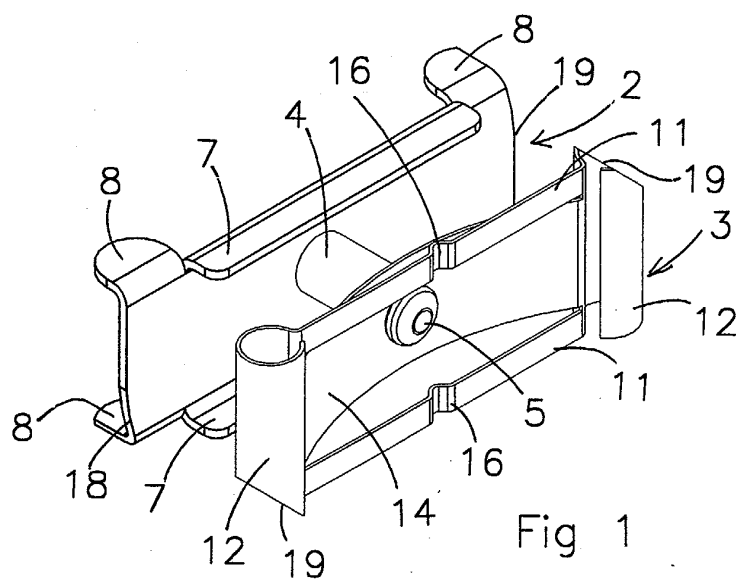
[0029] Fig. 10 shows a third embodiment of the clamping bracket according to the invention, which differs from the clamping bracket shown in Fig. 7 in that a rigid filler piece 41 in wire form has been fitted into the short, cylindrical end parts 12 of the resilient coupling piece 3. The filler piece 41 comprises, for each short side part 12, a bent section 42, first limbs of which are fitted into the respective short end parts 12, and also a bridge piece 43 which is parallel to the long side parts 11 and connects the other limbs of the bent sections 42 to one another.

[0030] The third embodiment of the clamping bracket according to the invention shown in Fig. 10 is, for example, suitable for coupling two profiled sections 35, which may form part of door frames, to one another. As can be seen from Fig. 11 and 12, the bent pieces 42 of the filler piece 41 have second limbs parallel to the axis 5, with a length which is sufficient to substantially bridge or fill a distance between the short side parts 12 of the resilient coupling piece 3 and the base 37 of the profiled section 35 in which the resilient coupling piece 3 is arranged.

[0031] Further embodiments are possible within the scope of the claims. For example, it is not necessary for the frame composed of the long side parts 11 and the short side parts 12 to form a single unit with the flexible plate part 14. In accordance with Fig. 13, for example, the clamping bracket shown in Fig. 1 has been modified such that the resilient coupling piece 46 comprises a frame composed of long side parts 11 and short side parts 12, and also a separate, flexible plate part 48, with end sections of the flexible plate part 48 fitting into the short side parts 12 via slits 49. It will be clear from the plan view of the clamping bracket of Fig. 13 which is shown in Fig. 14 that the frame composed of the parts 11, 12 is retained captively by the flexible plate part 48 and imparts a curved shape to the plate part 48. Furthermore, as an alternative to the filler piece 41 shown in Fig. 10, it would be possible to make do with the curved sections 42 thereof, as shown for the fifth embodiment of the invention illustrated in Fig. 15. To prevent undesirable rotation of the curved sections 42 about the longitudinal axis of their inserted limbs, it would be possible to use a very tight fit in the short side parts 12 or to use non-cylindrical forms of the short side parts 12 and of the limbs of the bent sections (filler pieces) 42 which are fitted into them.

Claims

1. Clamping bracket for coupling two profiled sections (24, 35), comprising an elongate, rigid coupling piece (2), an elongate, resilient coupling piece (3), which is substantially parallel to the rigid coupling piece (2) and comprises a flexible plate part (14), and at least one connecting member (4), which is arranged between the rigid coupling piece (2) and the plate part (14) of the resilient coupling piece (3) of the coupling pieces (2, 3) in such a manner that the coupling pieces (3, 4) can rotate with respect to one another, at a distance from one another, about an axis (5) passing through the said centres, and the plate part (14) can be bent flexibly to and fro parallel to the axis (5), the coupling pieces (2, 3) being adapted to be received in respective spaces (26, 36) of the profiled sections, which spaces have openings which face one another and the dimension of which transversely with respect to the longitudinal direction of the profiled sections (24, 35) is smaller than the length of the respective coupling piece (2, 3), **characterized in that** the resilient coupling piece (3) at the ends of the plate part (14), has two end parts (12), which are fixed at a distance from one another which is such that the plate part (14) is bent.
2. Clamping bracket according to claim 1, **characterized in that** the plate part (14) and the end parts (12) of the resilient coupling piece (3) are integral.
3. Clamping bracket according to claim 1, **characterized in that** the plate part (14) and the end parts (12) of the resilient coupling piece (3) are parts which are coupled to one another separately from the plate part (14).
4. Clamping bracket according to one of the preceding claims, **characterized in that** the end parts (12) of the resilient coupling piece (3) are end parts of a rigid frame.
5. Clamping bracket according to one of the preceding claims, **characterized in that** a coupling piece (2, 3) has filler means for filling a distance between the remainder of the coupling piece (2, 3) and a wall lying opposite the opening of the space (26, 36) of a profiled section (24, 35) which is adapted for receiving the coupling piece (2, 3).
6. Clamping bracket according to claim 5, **characterized in that** the filler means of the resilient coupling piece (3) are formed by widened sections, extending parallel to the axis (5), of the end parts (11, 12) of the resilient coupling piece (3).
7. Clamping bracket according to claim 5, **characterized in that** the filler means of the resilient coupling piece (3) are formed by one or more filler pieces which start at the end parts (12) of the resilient coupling piece (3).
8. Clamping bracket according to claim 7, **characterized in that** the filler pieces (42) are elongate and bent, a first limb of a filler piece (42), parallel to a main surface of the resilient coupling piece (3), being received in a space in an end part (12), and a second limb of the filler piece (42) being parallel to the axis (5).
9. Clamping bracket according to claim 8, **characterized in that** the filler pieces (42), together with a connecting part (43) which connects the two limbs, form an integral filler piece (41).
10. Clamping bracket according to claim 9, **characterized in that** the integral filler piece (41) comprises a bent rigid wire.
11. Clamping bracket according to claim 5, **characterized in that** the rigid coupling piece (2) is formed from plate material and the filler means of the rigid coupling piece (2) are formed by suitably bent end sections (8) thereof.
12. Clamping bracket according to claim 5, **characterized in that** the filler means of the rigid coupling piece (2) are formed by one or more filler pieces (34).



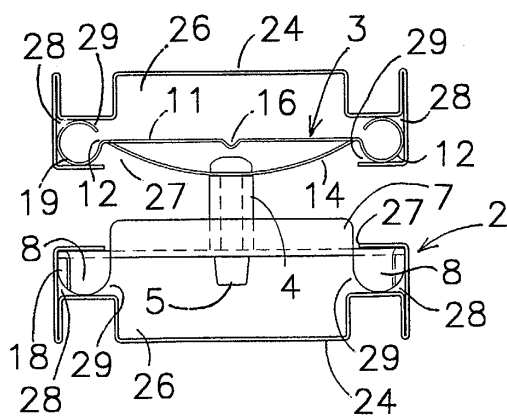


Fig 5

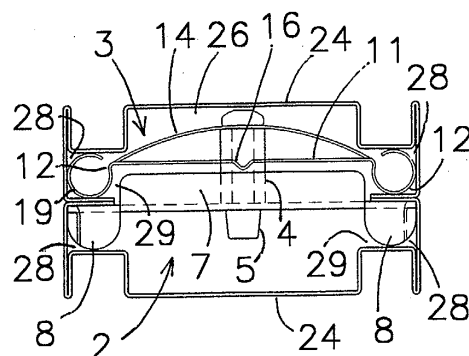


Fig 6

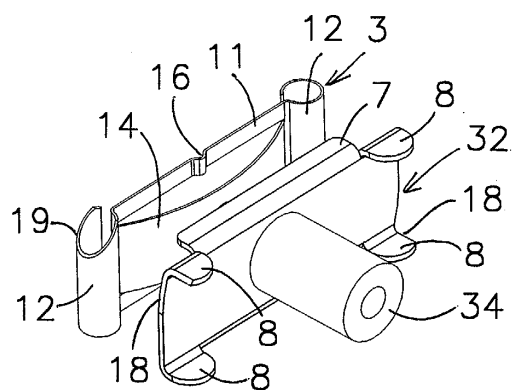


Fig 7

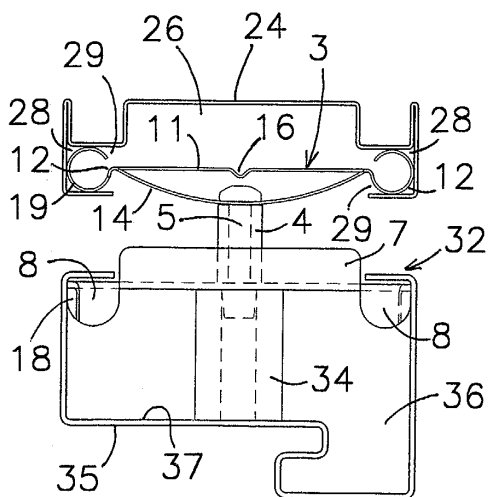


Fig 8

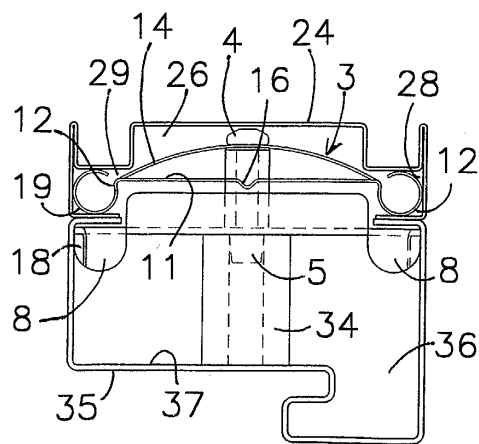


Fig 9

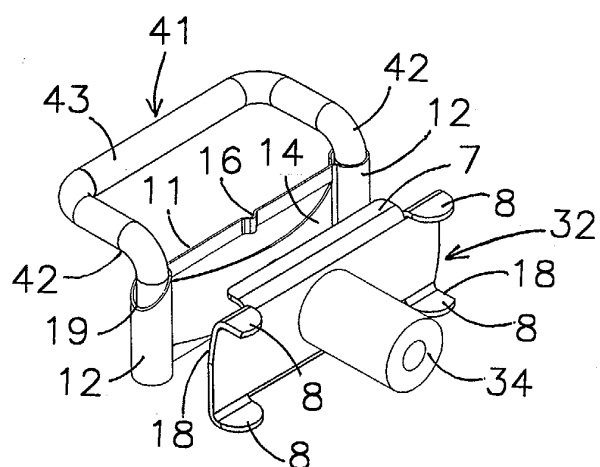


Fig 10

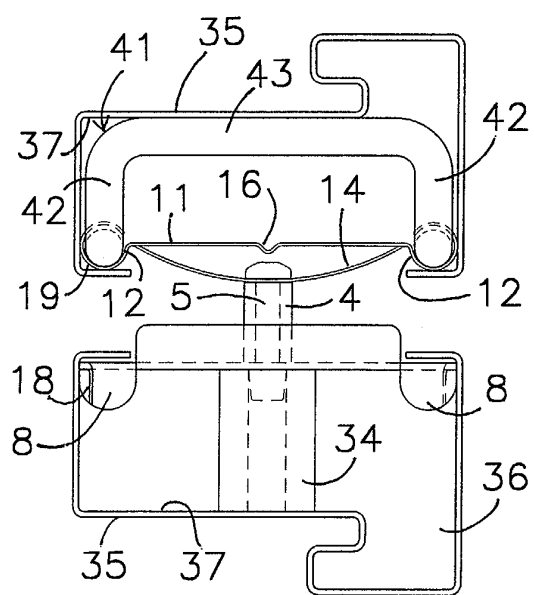


Fig 11

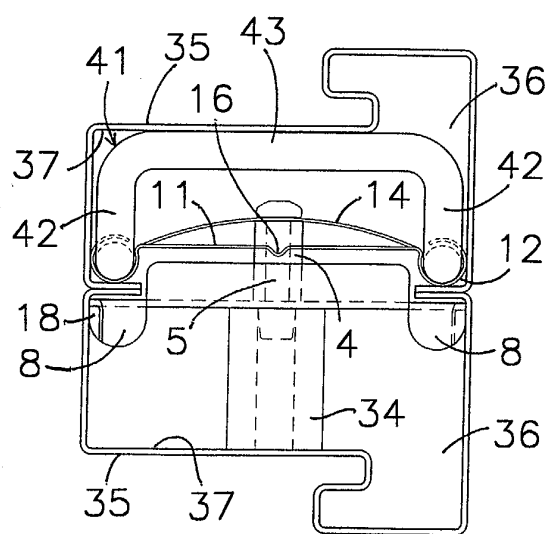
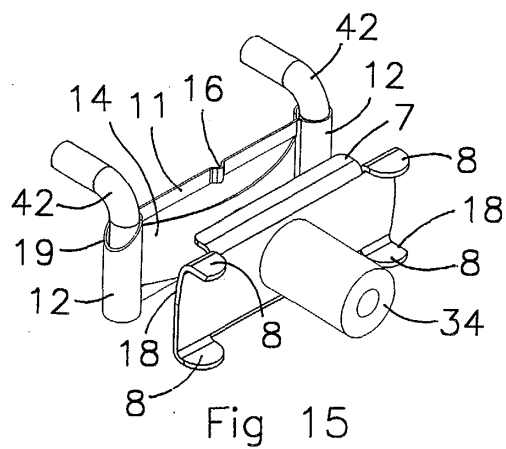
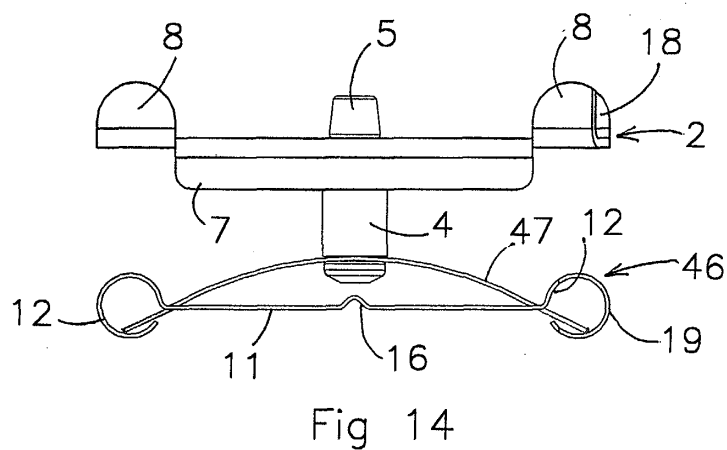
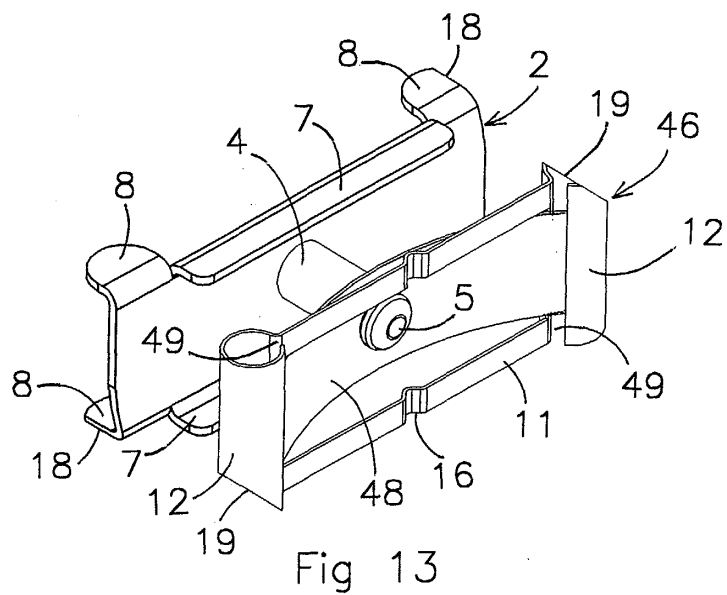


Fig 12





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EUROPEAN SEARCH REPORT

Application Number
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			E06B E04B F16B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		24 June 2004	Depoorter, F
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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