(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 336 697 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
20.08.2003 Bulletin 2003/34

(51) Int Cl.[7]: **E04D 3/08**, E04B 7/06

(21) Application number: **03075443.6**

(22) Date of filing: **14.02.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT SE SI SK TR
Designated Extension States:
AL LT LV MK RO

(30) Priority: **18.02.2002 BE 200200102**

(71) Applicant: **Reynaers Aluminium, naamloze vennootschap**
2570 Duffel (BE)

(72) Inventor: **Peeters, Paul**
2500 Lier (BE)

(74) Representative: **Donné, Eddy**
Bureau M.F.J. Bockstael nv
Arenbergstraat 13
2000 Antwerpen (BE)

(54) Angle joint system connecting a strut to two struts connected at an angle, as well as a corner piece designed to that end

(57) The present invention concerns an angle joint system connecting a cam or bottom strut (3) to two upper edge struts (4) connected at an angle, and having a corner piece (1) that is fixed to the upper edge struts (4) and a fastening piece (2) which fixes the cam or bottom strut (3) to the corner piece (1), characterised in that the corner piece (1) has a base part (6) as well as flanges (8) which are hinge-mounted to this base part (6) on both side edges which, on the inner side of the angle, stand at right angles to both the upper edge struts (4) and are fixed to these upper edge struts (4).

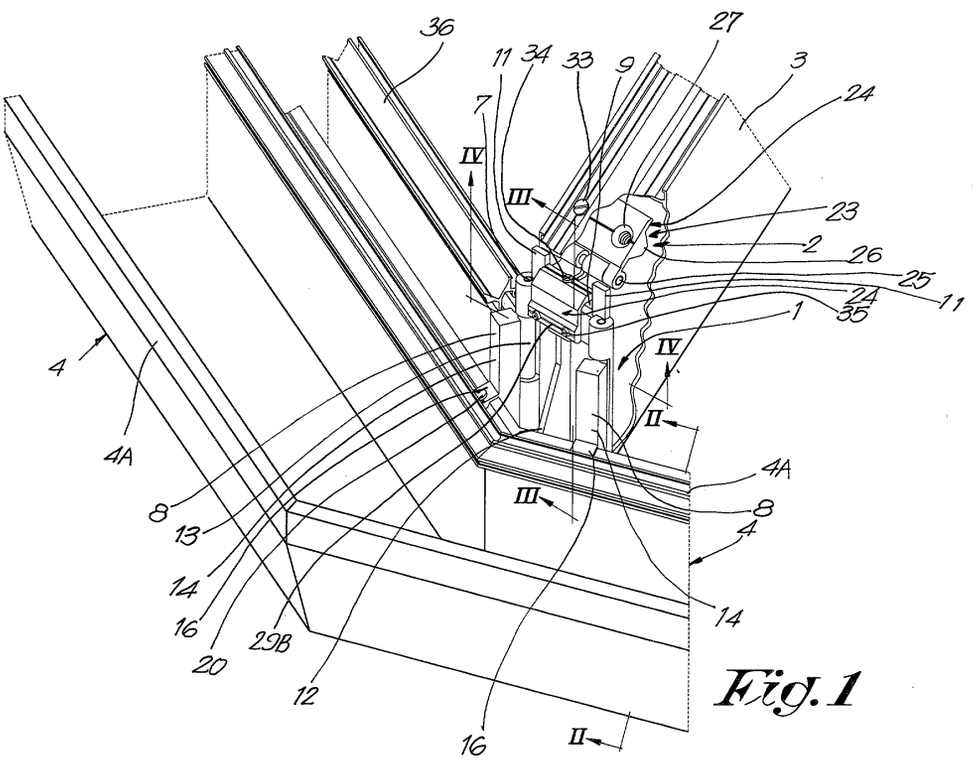

Fig. 1

EP 1 336 697 A1

Description

[0001] The present invention concerns an angle joint system connecting a strut, in particular a cam or bottom strut, to two upper edge struts connected at an angle, and having a corner piece that is fixed to the upper edge struts and a fastening piece which fixes the cam or bottom strut to the corner piece.

[0002] Such angle joint systems are used among others for the construction of verandas, whereby a sloping roof structure is provided on side walls forming an angle in relation to one another. The side walls have horizontal upper edge struts at the top which usually also form gutter struts. These upper edge struts are connected to one another in a conventional manner, for example by means of corner pieces provided in the struts. The inclined cam or bottom struts of the roof construction are fixed to said gutter struts. Such an inclined cam or bottom strut is fixed in the angle between two upper edge struts by means of an angle joint system.

[0003] With known angle joint systems, the corner piece connects to the upper edge struts with two standing sides on the inside of the angle, whereby these sides are screwed to the two upper edge struts respectively.

[0004] The problem is, however, that the angle between the two gutter struts may have different values, depending on the veranda model.

[0005] For this reason, the known angle joint systems are supplied with a number of corner pieces for a number of predetermined angles between the gutter struts.

[0006] This implies that different sizes of corner pieces have to be manufactured and kept in stock, which is expensive, and that the degree of freedom of the angles between the side walls of the veranda is restricted. These angles cannot have any value whatsoever.

[0007] The invention aims an angle joint system which remedies said disadvantages and which can connect a cam or bottom strut to upper edge struts forming different angles in relation to one another, for example angles of 90° to 160°, with a single embodiment of the corner piece.

[0008] This aim is reached according to the invention in that the corner piece has a base part as well as flanges which are hinge-mounted to this base part on both side edges which, on the inner side of the angle, stand at right angles to both the upper edge struts and are fixed to these upper edge struts.

[0009] Preferably, the base part is provided with a foot at the bottom, for example in the shape of a triangle having a vertex angle of 90°, resting on an edge of the upper edge struts on the inside of said upper edge struts, and which is preferably also situated with its vertex against the upper edge struts which converge in the angle.

[0010] On the inside of the angle, cover struts may be fixed to the two converging upper edge struts, whose far ends have been cut at right angles and connect to the flanges.

[0011] The connecting piece is preferably a hinge with two hinge pieces connected by means of a hinge pen, whereby one hinge piece is fixed to the cam or bottom strut and the other hinge piece has a mainly U-shaped far end meshing over the base part of the corner piece.

[0012] As the connecting piece is a hinge, the same connecting piece can be used for different inclinations of the cam or bottom struts.

[0013] The leg of the U-shaped far end situated on the side of the upper edge struts can be pushed away from the base part by at least one tightening screw, so that, on the other side, the other leg and thus also the cam or bottom strut is drawn towards this base part.

[0014] An adjusting screw can be screwed above the upper edge of the base part, through the part of the U-shaped far end situated between the legs, pushing this far end away from said upper edge.

[0015] This makes it possible to adjust the screw and thus the cam or bottom strut in height in relation to the upper edge struts.

[0016] The invention also concerns a corner piece, a fastening piece respectively, of the angle joint system according to any of the preceding embodiments.

[0017] In order to better explain the characteristics of the invention, the following preferred embodiment of an angle joint system and of a corner piece and fastening piece used thereby according to the invention is described as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 represents a view in perspective from the outside of two gutter struts and a cam strut connected to one another by means of an angle joint system according to the invention, with a single cover strut;
figure 2 represents a section according to line II-II in figure 1, without a cam strut;
figure 3 represents a section according to line III-III in figure 1, without a cam strut;
figure 4 represents a section according to line IV-IV in figure 1;
figure 5 represents a view in perspective, analogous to that in figure 1, but seen from the inside and with cover struts;
figures 6 and 7 show views in perspective of the corner piece from the angle joint system in the preceding figures;
figure 8 shows a view in perspective of the fastening piece of the angle joint system from figures 1 to 5.

[0018] Figures 1 to 5 represent an angle joint system which mainly consists of a corner piece 1 and a fastening piece 2 and which connects a cam strut 3 of a veranda to two upper edge struts 4 connected to one another at an angle of 135° which, in the given example, are gutter struts.

[0019] The gutter struts 4 are mitred and converge in the angle. Each of these gutter struts 4 is a composed

strut with a gutter 4A on the outside which is connected to an inner strut 4C by means of two synthetic strips 4B forming a thermal interruption. The latter strut 4C has a wall 4D on the side of the strips 4B which is less high than the gutter 4A, and another lower side wall 4E on the other side.

[0020] As is represented in detail in figures 6 and 7, the corner piece 1 consists of a foot 5 in the shape of an equilateral right-angled triangle, a base part 6 standing on the long side of the foot 5 and which is practically as wide as said side is long, and two flanges 8 which are hinge-mounted to the standing edges of said base part 6 by means of a hinge pen 7.

[0021] At the top, the base part 6 is provided with a recess 9 which is confined at the bottom by a thickened strip 10 extending between the cases 11 provided on the edges of the base part 6 and in which the hinge pen 7 is bearing-mounted.

[0022] Between this strip 10 and the foot 5 is provided a rib 12 in the middle, increasing in height towards the foot.

[0023] Each of the flanges 8 has a case 13 surrounding the hinge pen 7, and a wing 14 connected to it extending outside the base part 6 at the bottom. On its outer edge, this wing 14 is provided with a projection 15, and right on top of the latter with a protruding lip 16 which is directed downward in a slanting manner and which is provided with a triangular projection 17 at the bottom. Through the lip 16 and its projection 17 is provided a hole 18.

[0024] The corner piece 1 is placed against the gutter struts 4 on the side of the interior angle with the top of its triangular foot 5, whereby the foot 5 rests on the side wall 4E of these gutter struts 4.

[0025] The flanges 8 are placed at right angles to the respective gutter struts 4. Each of these flanges 8 connects with its projection 15 to the wall 4D and sticks with the lower end of its wing 14 in the groove 19 formed between the walls 4D and 4E of the gutter struts 4.

[0026] Each flange 8 is fixed to a gutter strut 4 by means of a screw 20 which is screwed in the upper edge of the wall 4D of said gutter strut, through the hole 18 in its lip 16. Said edge is provided with a triangular groove 22 in which fits the projection 17 of the lip 16, so that this lip and thus also the flange 8 are positioned crosswise on said edge.

[0027] The cam strut 3 mainly has a rectangular section and is sawn off at right angles at its far end.

[0028] As is represented in detail in figure 8, the fastening piece 2 is a hinge with two hinge pieces 23 and 24 which are hinge-mounted to one another by means of a hinge pen 25.

[0029] The hinge piece 23 is provided with a projection 26 which is parallel to the hinge pen 25, and it has two threaded openings 27 extending right through said projection.

[0030] The hinge piece 24 has a part 28 with two cases surrounding the hinge pen 25, and a U-shaped far end 29. In the part 29C of the far end 29 situated between the legs 29A and 29B is provided a threaded opening 30 in the middle. In the leg 29B which is farthest away from the hinge pen 25 are provided two threaded openings 31 near the edge.

[0031] Parallel to the hinge pen 25, the far end 29 has a length that is almost equal to the width of the recess 9 in the base part 6.

[0032] As represented in figures 1 to 5, the hinge piece 23 protrudes in the cam strut 3 and it is connected to the latter by means of two screws 32 screwed into the openings 27 of said hinge piece 23 through openings 33 in said cam strut.

[0033] The hinge piece 24 meshes with its U-shaped far end 29 over the base part 6, whereby the part 29C is countersunk in the recess 9 to an extent determined by an adjusting screw 34 which is screwed into the opening 30 and pushes up the part 29C in relation to the bottom edge of the recess 9.

[0034] Two tightening screws 35 screwed in the openings 31 push away the leg 29B from the base part 6, as a result of which the hinge pen is pulled forward and the cam strut 3 is thus pulled against the back side of the base part 6.

[0035] The cam strut 3 and the gutter struts 4 can be made of aluminium. The corner piece 1 and the fastening piece 2 are for example made of cast aluminium.

[0036] The angle between the gutter struts 4 may have any value whatsoever between 90° and 160° thanks to the hinge-mountable flanges 8.

[0037] The inclination of the cam strut 3 can be adjusted, as the fastening piece is made of two hinge-mountable hinge pieces 23 and 24, whereby the height of the connection to the gutter struts 4 can be adjusted by means of the adjusting screw 34, and the tightening screws 35 allow for a limited adjustment of the length of the cam strut 3.

[0038] On the inside of the angle, cover struts 36 can be screwed on the gutter struts 4. One or two of such cover struts 36 are represented in figures 1 and 5 only. The cover struts 36, whose far ends are cut at right angles, connect to the flanges 8 of the corner pieces 1. Roof struts which are possibly situated between the cam struts 3 may be fastened to these cover struts 36.

[0039] The above-described angle joint system must not necessarily be applied in a veranda. It can also be applied in other constructions with struts, for example canopies.

[0040] The upper edge struts must not necessarily be gutter struts 4.

[0041] Although, in the preceding description, only cam struts are mentioned which are fastened to the upper edge struts or gutter struts, it is clear that the angle joint system may also have bottom struts instead of cam struts.

[0042] The invention is by no means limited to the above-described embodiment represented in the accompanying drawings; on the contrary, such an angle

joint system, corner piece and fastening piece can be made in all sorts of variants while still remaining within the scope of the invention.

Claims

1. Angle joint system connecting a cam or bottom strut (3) to two upper edge struts (4) connected at an angle, and having a corner piece (1) that is fixed to the upper edge struts (4) and a fastening piece (2) which fixes the cam or bottom strut (3) to the corner piece (1), **characterised in that** the corner piece (1) has a base part (6) as well as flanges (8) which are hinge-mounted to this base part (6) on both side edges which, on the inner side of the angle, stand at right angles to both the upper edge struts (4) and are fixed to these upper edge struts (4).

2. Angle joint system according to claim 1, **characterised in that** the base part (6) is provided with a foot (5) at the bottom, resting on an edge of the upper edge struts situated on the inside of said upper edge struts.

3. Angle joint system according to claim 2, **characterised in that** the foot of the corner part (1) has the shape of a triangle, preferably with a vertex angle of 90°.

4. Angle joint system according to claim 3, **characterised in that** the foot of the corner part (1) is situated with its top against the upper edge struts (4) converging in the angle.

5. Angle joint system according to any of the preceding claims, **characterised in that** the two flanges (8) are each provided with a lip (16) on their edges which is screwed to a wall (4D) of one of the upper edge struts (4) by means of a screw (20).

6. Angle joint system according to claim 5, **characterised in that** the lip (16) is provided with a projection (21) at the bottom fitting in a groove (22) with a corresponding shape in an upper edge of the wall (4D).

7. Angle joint system according to any of the preceding claims, **characterised in that** cover struts (36) are provided on the inner side of the angle against the two converging upper edge struts (4) whose far ends are cut at right angles and connect to the flanges (8).

8. Angle joint system according to any of the preceding claims, **characterised in that** the connecting piece (2) is a hinge with two hinge pieces (23,24) connected by a hinge pen (25), whereby one hinge piece (23) is fixed to the cam or bottom strut (3) and the other hinge piece (24) has a mainly U-shaped far end (29) meshing over the base part (6) of the corner piece (1).

9. Angle joint system according to claim 8, **characterised in that** the leg (29B) of the U-shaped far end (29) situated on the side of the upper edge struts (4) is pushed away from the base part (6) by at least one tightening screw (35), so that, on the other side, the other leg (4A) and thus also the cam or bottom strut (3) is drawn towards this base part (6).

10. Angle joint system according to claim 8 or 9, **characterised in that**, above the upper edge of the base part (6), through the part (29C) of the U-shaped far end (29) situated between the legs, is screwed an adjusting screw (34) pushing this far end (29) away from said upper edge.

11. Angle joint system according to any of claims 8 to 10, **characterised in that** the base part (6) of the corner piece (1) has a recess (9) for the U-shaped far end (29) of one of the hinge parts (23,24) at the top.

12. Corner piece for an angle joint system according to any of the preceding claims, **characterised in that** it has a base part (6) and flanges (8) which are hinge-mounted to said base part (6) on both side edges.

13. Corner piece for an angle joint system according to any of claims 1 to 11, **characterised in that** it is a hinge with two hinge pieces (23,24) connected by means of a hinge pen (25), whereby one of the hinge pieces (24) has a mainly U-shaped far end (29).

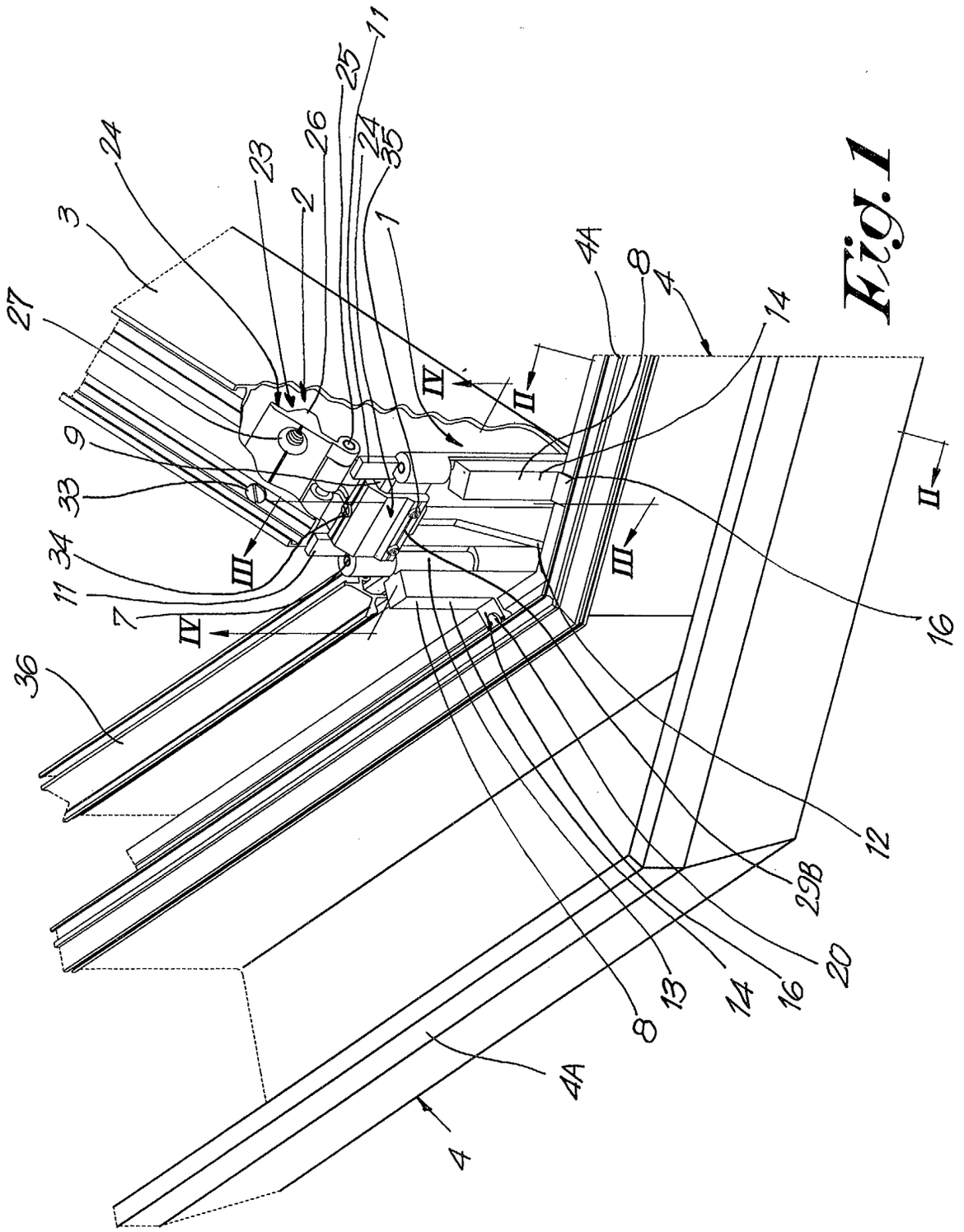
11
25
24
26
23
24
35
2
1
3
27
4A
8
4
14
II
IV
9
33
III
34
11
7
IV
36
16
12
29B
20
16
14
13
8
4A
4

Fig. 1

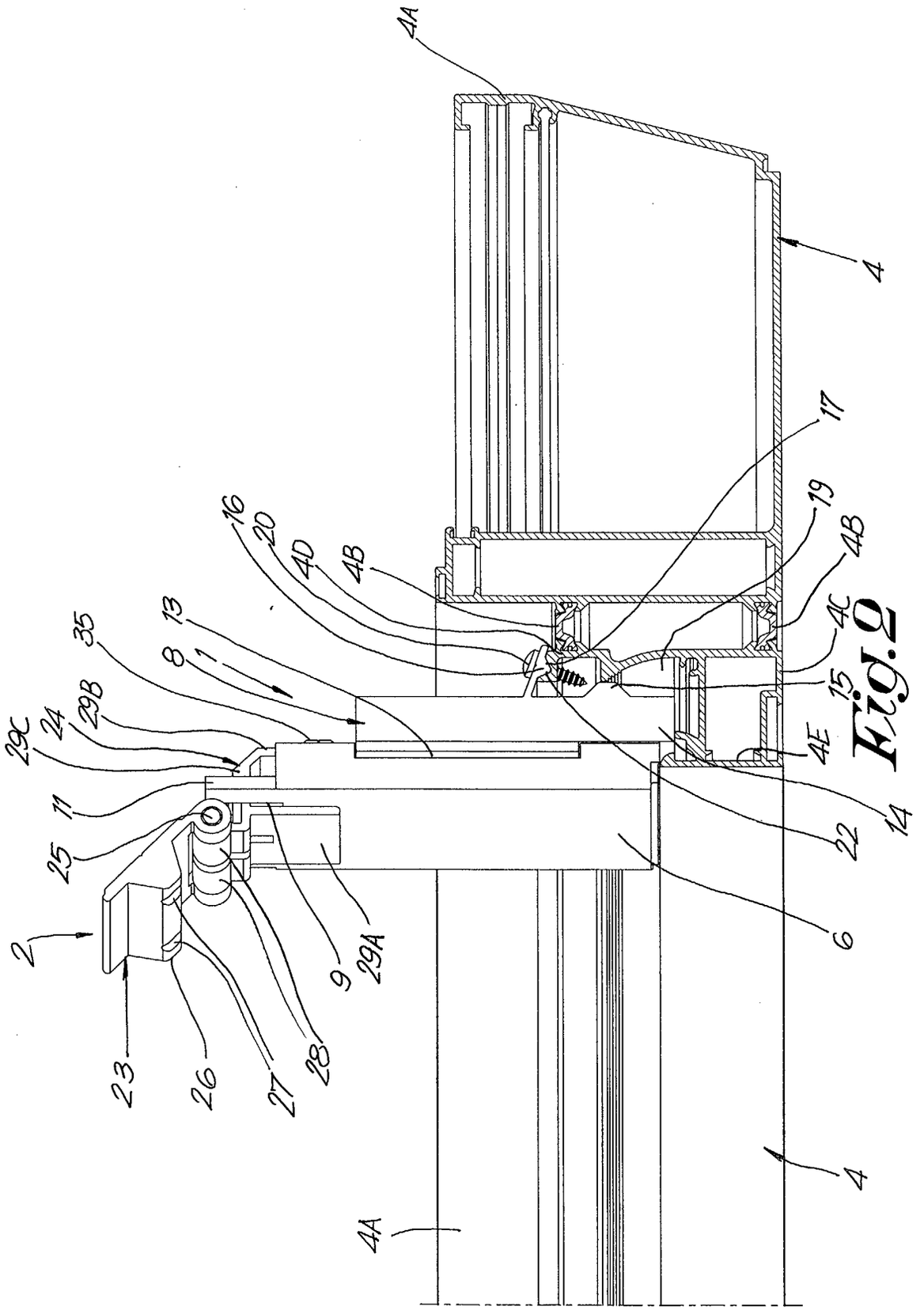
4A
4
17
19
16
20
40
4B
4B
4C
35
13
8
1
15
29C
24
29B
4E
11
14
22
25
6
2
9
29A
23
26
27
28
4
4A

Fig.2

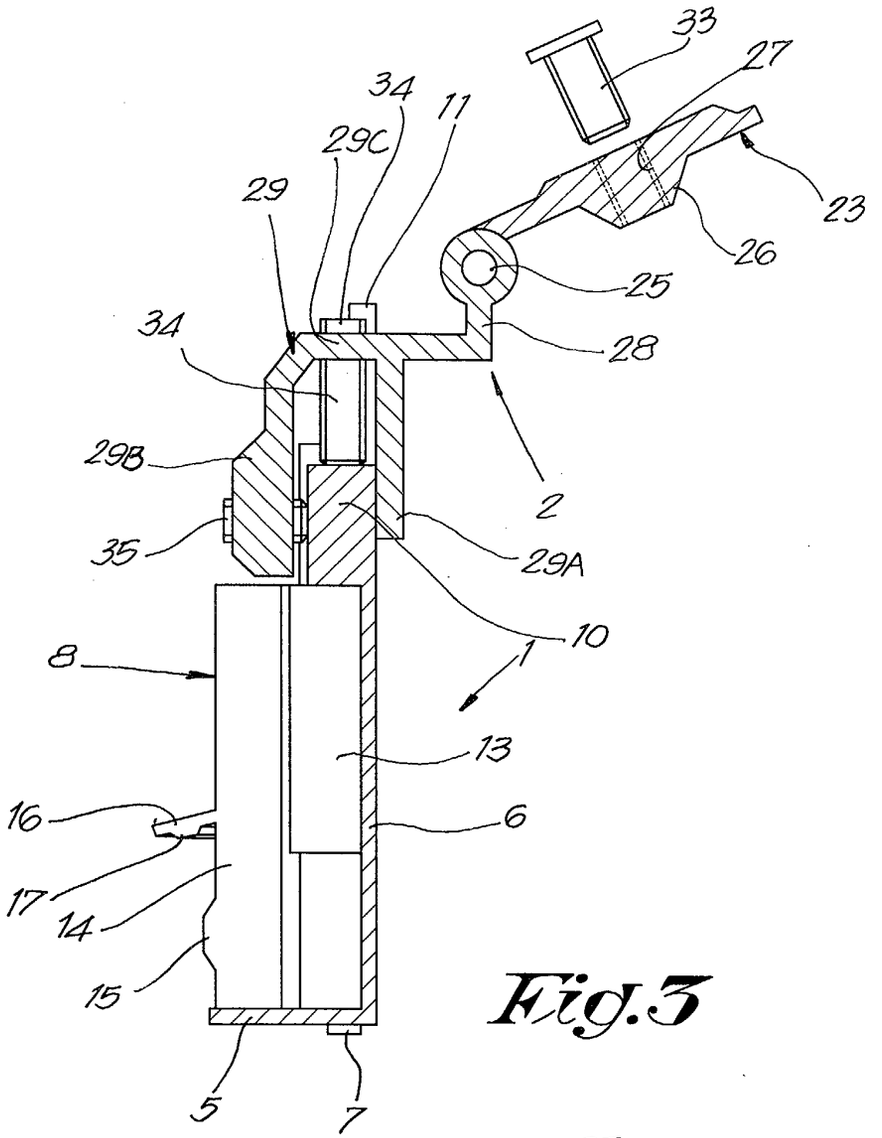
33
27
34
11
29C
29
23
26
25
34
28
29B
2
35
29A
10
8
1
13
16
6
17
14
15
5
7

Fig.3

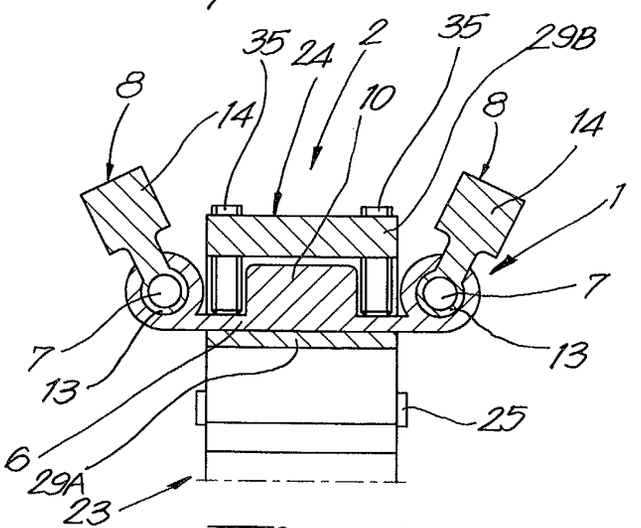
35
24
2
35
29B
8
14
10
8
14
1
7
7
13
13
6
29A
25
23

Fig.4

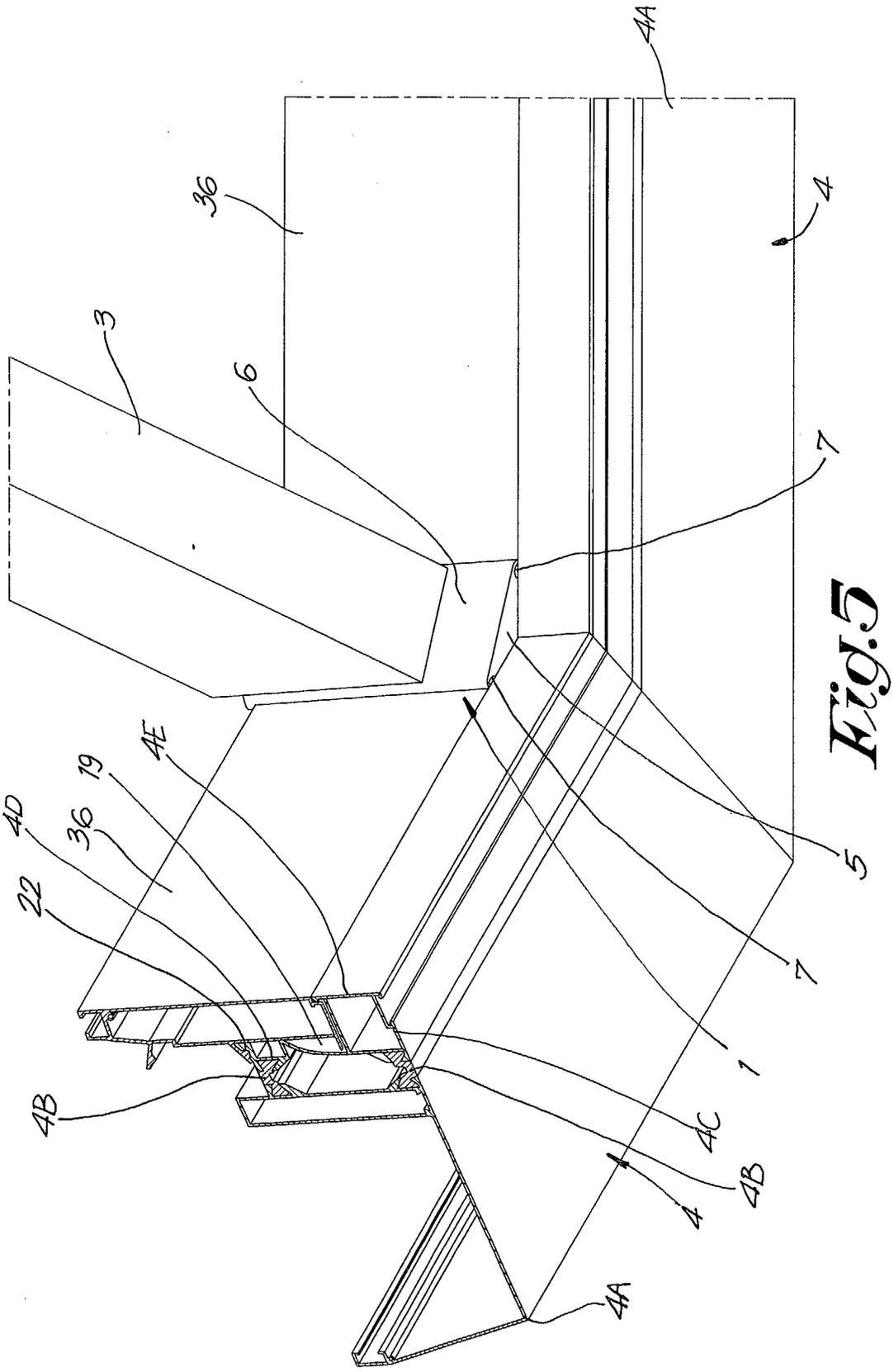

Fig.5

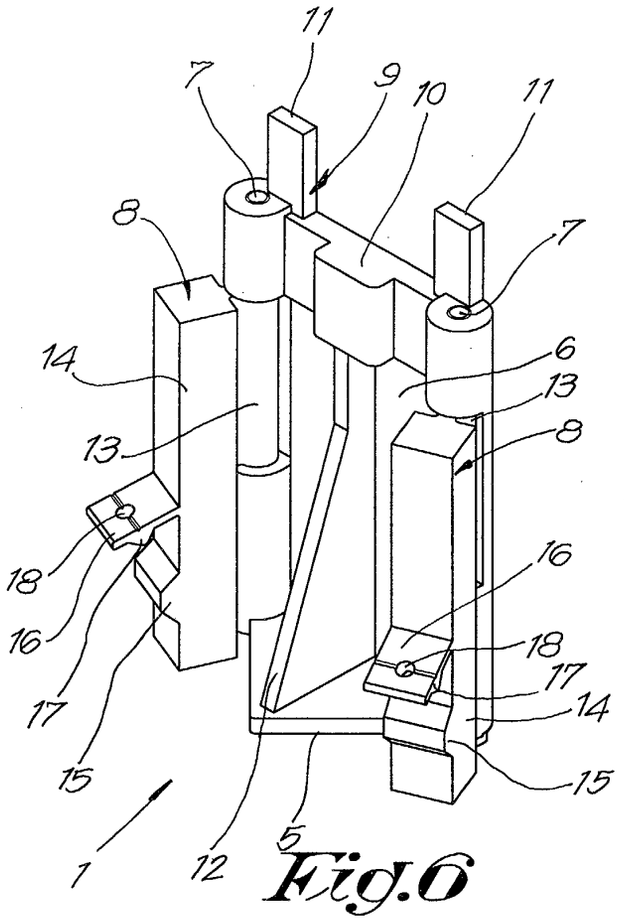

Fig.6

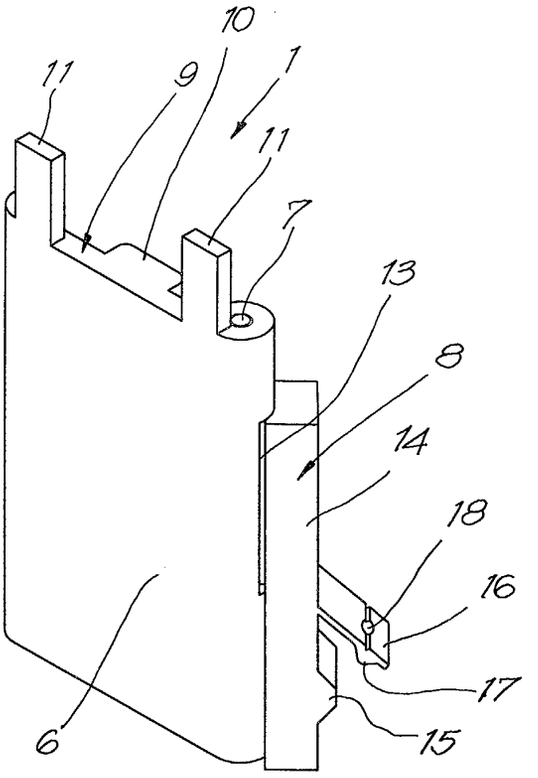

Fig.7

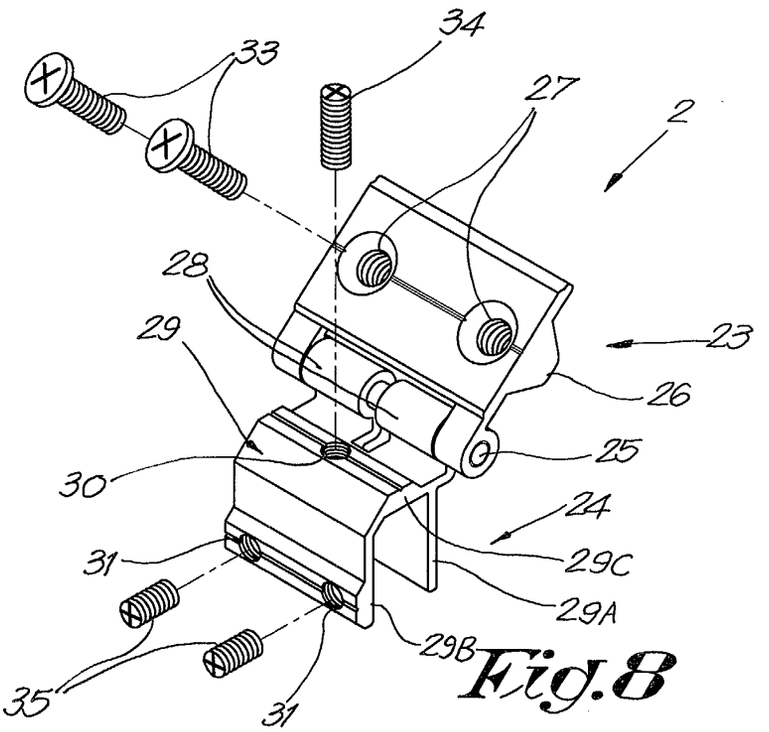

Fig.8

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 07 5443

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.7)
Y	DE 36 40 489 A (ERBSLOEH JULIUS & AUGUST) 9 June 1988 (1988-06-09)	1,12	E04D3/08 E04B7/06
A	* column 3, line 68 - column 4, line 29 * * column 4, line 48 - column 5, line 19 * * figures 2,3 *	8,13	
Y	GB 2 093 144 A (MARLEY TRIDENT LTD) 25 August 1982 (1982-08-25) * page 2, line 54 - page 2, line 83 * * figures 4,4A *	1,12	
A	DE 43 16 063 C (PHILIPPI GERD) 18 August 1994 (1994-08-18) * claim 1; figures 1,2,4 *	1-3	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E04D
E04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 May 2003	Hendrickx, X

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 07 5443

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-05-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 3640489 A	09-06-1988	DE 3640489 A1	09-06-1988
GB 2093144 A	25-08-1982	NONE	
DE 4316063 C	18-08-1994	DE 4316063 C1	18-08-1994
		AT 148758 T	15-02-1997
		DK 624694 T3	11-08-1997
		EP 0624694 A2	17-11-1994
		ES 2099504 T3	16-05-1997

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82