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(54) **Section-connecting element**

(57) Section-connecting element (1, 51, 53), comprising two substantially flat legs (2), each suitable for sliding in the longitudinal direction of a section (20) into a channel (21) with edge parts (24) bent towards each other. A starting part (4) of each leg, going out from the starting part (4) of the other leg, has a width (31) that is greater than a channel edge distance (35) between the ends of the edge parts (24) of the channel (21). An end

part (5) of the leg (2) has a width (34) that is smaller than the channel edge distance (35). A transitional part (6) of the leg between the starting part (4) and the end part (5) has a width (42) that is approximately equal to the channel edge distance (35), in such a way that, after being inserted into the channel, the leg can be bent over in the transitional part, and edges of a bent area of the transitional part grip the channel edges.

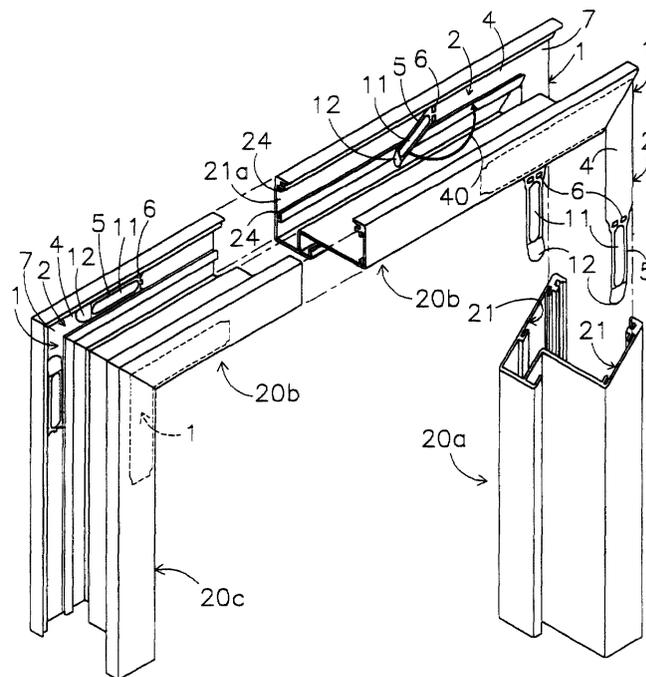


Fig 5

Description

[0001] The invention relates to a section-connecting element, comprising two substantially flat legs, each suitable for sliding in the longitudinal direction of a section into a channel of the section in a substantially fitting manner, which legs are provided with locking means which in combination with counter means that are separate from them serve to lock the leg in the channel of the respective section.

[0002] Such a section-connecting element is known in practice in the form of a corner element. Each leg of the known section-connecting element has one or more protuberances going out from a main surface of the leg. An upright channel wall of the section along which a leg of the connecting element is slid has for each protuberance an aperture for allowing through a screw at a point which the protuberance has just passed during the sliding-in operation. During the connection of sections by means of a connecting element on a building site, after a leg has been slid into a section channel, a screw is screwed through the aperture next to a protuberance of the leg, thereby preventing the leg from sliding back out of the section channel.

[0003] The known section-connecting element has the drawback that it is necessary beforehand to drill holes in the sections at accurately determined points for the above-mentioned screws. In itself, this is a difficult and cost-increasing operation, but it is aggravated by the fact that the channel wall in which the holes have to be drilled has a small dimension and often forms part of an edge part of the section that is narrow and has a complicated cross section which makes drilling difficult.

[0004] Another drawback of the known connecting element is that an ultimate position of the element relative to the connected sections is dependent upon tolerances in the position of the screw apertures and the way in which a fitter turns the screws in the apertures, i.e. straight or at a slant, so that the element has no predetermined fixed location relative to the sections. This means that the sections may possibly be connected incorrectly relative to each other and slits become visible between their connected ends. This constitutes a major aesthetic drawback particularly when the known connecting element is used in inside walls. The inaccurate positioning can also mean that other parts of a wall of which the sections form part, such as doors and glass panels, are difficult to position and cannot be positioned correctly.

[0005] Another drawback of the known connecting element is that the heads of the above-mentioned screws used for locking or retaining the connecting element often remain visible, that is even after a wall constructed therewith is complete, and can show slits between elements on either side of the screw head. This again constitutes a major aesthetic drawback.

[0006] Yet another drawback of the known connecting element is that the above-mentioned screws for locking

the element often have to be screwed in from one side of a section combination, such as the outside of a door frame, which is difficult to reach on a building site and, prior to fitting in a wall, the section combination has to be assembled on a floor of the building site, which has to be clean, in order to prevent damage to the sections. Such working conditions cannot always be achieved on a building site and make the assembly of section combinations difficult.

[0007] Other known connecting elements comprise, in addition to the connecting element, various other types of separate locking means which may or may not require a specific preparatory operation on the sections or the use of special tools on site, in order to permit locking of a leg in a section channel. These known connecting elements are therefore likewise difficult and expensive to use.

[0008] The object of the invention is to eliminate the above-mentioned drawbacks.

[0009] To that end, the section-connecting element of the type mentioned in the preamble according to the invention is characterized in that a starting part of each leg, going out from the starting part of the other leg, has a width that is greater than a channel edge distance between edges of a respective U-shaped channel of the section that are bent towards each other into which channel the leg is slid, an end part of the leg has a width that is smaller than the channel edge distance, and a transitional part between the starting part and the end part has a width that is approximately equal to the channel edge distance, in such a way that, after being inserted into the channel, the leg can be bent over in the transitional part, and edges of a bent area of the transitional part grip the channel edges.

[0010] As a result, sections to be connected by means of the connecting element according to the invention do not have to be preworked, the assembly of section combinations, by the simple bending operation, can be carried out quickly and independently of the locations of the sections, on the ground or otherwise, and section positioning faults due to human error during the assembly of the section combination are extremely rare.

[0011] The section-connecting element according to the invention is preferably characterized in that at a point where the legs meet a tooth is formed in such a way that, after a leg has been slid into a channel of the section, the tooth extends against, but at most over the thickness of a wall of the channel. The tooth forms a stop, which limits the sliding of a leg into a section channel or pulling of the leg further into the channel during the bending over of its end part. In particular, when sections have to be connected at an angle, where a material thickness of the sections decreases towards the corner, this ensures that the sections are positioned and locked properly relative to each other, that no slit remains visible between the ends of the sections, and that corners of said section ends rest properly against each other.

[0012] Other features and advantages of the inven-

tion will become clear from the description that follows below of exemplary embodiments of the section-connecting element according to the invention. In the drawings:

Fig. 1 shows an elevational view of a first embodiment of a section-connecting element according to the invention;

Fig. 2 shows a side view of an end part of the connecting element of Fig. 1;

Fig. 3 shows a cross section of a section that is suitable for use in combination with the connecting element according to Fig. 1;

Fig. 4 shows a part of the section of Fig. 3 on a larger scale;

Fig. 5 shows in perspective a combination of three sections to be connected by means of four connecting elements according to Fig. 1;

Fig. 6 shows a perspective view of a second embodiment of a section-connecting element according to the invention; and

Fig. 7 shows an elevational view of a third embodiment of a section-connecting element according to the invention.

[0013] The section-connecting element 1 shown in Fig. 1 according to the invention comprises two legs 2, which according to Fig. 1 are identical, but need not be identical.

[0014] Each leg 2 comprises a starting part or root part 4, an end part 5, and a transitional part 6. The legs 2 are substantially flat, have a common main surface and merge into each other in a common area 7 of the end parts 4.

[0015] The end part 5 of each leg 2 has a reinforcement rib 11, which runs in the longitudinal direction of the leg 2 and which prevents deformation of the end part 5. The free end 12 of the end part 5 of each leg 2 is bent over towards the side with the reinforcement rib 11, so that during use of the connecting element 1 it can easily be gripped by a finger.

[0016] The transitional area 6 is weakened relative to the remainder of the leg 2 in such a way that when the leg 2 is bent by holding the common area 7 and the free end 12, the leg 2 will bend in the transitional area 6. As shown, the weakening can be formed by a row of two or more perforations 14 extending transversely to the leg. Instead of the two or more perforations 14, a single, preferably elongated perforation or a notch can be used.

[0017] Fig. 3 shows a cross section of a section 20 in which the connecting element 1 according to Fig. 1 can be used. The section 20 has two channels 21, of which the right channel 21 in Fig. 3 is shown on a larger scale in Fig. 4. The channel is U-shaped and comprises a bottom 22, upright walls 23 going out from the bottom, and edges or edge parts 24 facing each other.

[0018] The starting part 4 of each leg 2 of the connecting element of Fig. 1 has a width 31 that is practically

equal to a distance 32 between the upright walls 23 of the channel 21 of the section 20. The thickness of the starting part 4 of the leg 2 of the connecting element 1 is practically equal to the height of the upright walls 23.

5 As a result, the leg 2 of the connecting element 1 can easily be pushed into the channel 21.

[0019] A width 34 of the end part 5 of each leg 2 of the connecting element is smaller than a distance 35 between the ends of the edge parts 24 of the section channel 21.

10 **[0020]** Fig. 5 shows three sections 20a, 20b, 20c, the ends of which are mitred at an angle of 45°. The sections 20a, 20b, 20c form, for example, a door frame after being joined together.

15 **[0021]** The sections 20a, 20b, 20c are connected by means of four connecting elements 1 according to Fig. 1. After a leg 2 of a connecting element 1 has been slid as far as possible into, for example, channel 21a of section 20b, the end part 5 of the leg 2 is moved in the direction of the arrow 40, with the result that the leg 2 bends in the transitional area 6. In this process, material of the transitional part 6 moves laterally outwards, with the result that the transitional part 6 firmly grips the edge parts 24 of the channel 21a and leg 2 is prevented from sliding back out of the channel 21a.

20 The end part 5 can be bent over through 180°, so that it ultimately rests in a substantially flat position against the starting part 4 of the leg 2 and consequently does not constitute an obstacle for the components, such as pipes and cables, that have to be fitted in the remaining area of the section 20 of a wall construction of which the section combination 20a, 20b, 20c forms part. This situation is shown on the left in Fig. 5 for the connected ends of the sections 20b and 20c.

25 **[0022]** After the end parts 5 of the legs 2 of two connecting elements 1 situated opposite each other, such as the connecting elements 1 on the top right-hand side in Fig. 5, have been bent over through 180°, the other legs 2 of these connecting elements 1 can easily be slid into the corresponding section channels 21 of another section, section 20a in the example. The end parts 5 of said legs 2 can then be bent over through 180°, so that the desired connection can be achieved quickly and simply on a building site.

30 **[0023]** The transitional area 6 preferably has a width 42 that is slightly, for example 1 mm, greater than the distance 35 between the ends of the edge parts 24 of the section channel, and the width runs gradually from the width 34 of the end part 5 of the leg 2 to the width 42 of the transitional part 6. When in the case of this embodiment of the connecting element 1 the end part 5 of a leg 2 slid into a section channel 21 is bent over, the leg 2 is pulled firmly into the channel 21, and the edges of the transitional area 6 and the edge part 24 of the section channel 21 engage securely in each other. A form-retaining section combination, such as the combination 20a, 20b, 20c, can be obtained in a very simple and rapid manner in this way.

[0024] It is preferable for a tooth 45 to be formed at the beginning of the starting part 4 of each leg 2 of the connecting element 2, in other words the part furthest away from the end 12 of the leg 2, the tip of which tooth projects over a distance 46, of for example 0.8 mm, beyond an adjacent edge of the starting part 4 of the leg 2. During the sliding of a leg 2 of the connecting element 1 into a section channel 21, or the pulling of said leg caused by the bending action, the tooth 45 forms a stop which in the exemplary application shown in the case of the upright walls 23 of the channel 21 rests on the sawn face of the section 20, in Figs 3 and 4 the plane of drawing, and fixes the connecting element 1 at an accurately predetermined position relative to the two sections 20 to be connected. Since the distance 46 is relatively short, preferably shorter than the thickness of the section in the case of the opposite upright wall 23 of the channel 21, the tooth in the assembled section combination, such as 20a, 20b and 20c, is not visible from the outside.

[0025] The sections are often made of extruded aluminium, while a mitred end of a section decreases in thickness towards the tooth 45. This means that the tooth 45 can penetrate into the material of the two sections 20 to be connected and fix itself therein, so that the distances 46 are equalised and an accurate positioning of the sections relative to each other is obtained, in such a way that their projections and edges rest accurately against each other.

[0026] When the tooth 45 penetrates into the material of a section 20, the material of the section will have to have a way out. In order to ensure that this material does not go into the seam between the two sections 20 to be connected, a recess or burr space 48 is formed on each side of the tooth 45, in which recess the above-mentioned material of the sections 20 can find a way out.

[0027] Although the section-connecting element according to the invention explained above has the shape of a right-angled corner element or right-angled pitch angle, the angle between the legs 2 can be of any size. The angle may even be 180°, as illustrated by means of the straight connecting element 51 of Fig. 6. As shown, such a straight element 51 can be provided with a tooth 45 and recesses 48 opposite each other on the two longitudinal edges.

[0028] Moreover, the invention can be used for a section-connecting element in the form of a corner element, such as the connecting element 53 shown in Fig. 7, in which the main surfaces of the legs 2 cross each other. Such a horizontal corner element 53 can be obtained by bending the legs 2 of the connecting element 51 of Fig. 6 towards each other in the region of the tooth 45 and by bending the teeth 45 towards the inside of the angle formed between the legs 2.

Claims

1. Section-connecting element (1, 51, 53), comprising two substantially flat legs (2), each suitable for sliding in the longitudinal direction of a section (20) into a channel of the section in a substantially fitting manner, which legs are provided with locking means which in combination with counter means that are separate from them serve to lock the leg in the channel of the respective section, **characterized in that** a starting part (4) of each leg (2), going out from the starting part (4) of the other leg (2), has a width (31) that is greater than a channel edge distance (35) between edges (24) of a respective U-shaped channel (21) of the section (20) that are bent towards each other into which channel the leg (2) is slid, an end part (5) of the leg (2) has a width (34) that is smaller than the channel edge distance (35), and a transitional part (6) between the starting part (4) and the end part (5) has a width (42) that is approximately equal to the channel edge distance (35), in such a way that, after being inserted into the channel (21), the leg (2) can be bent over in the transitional part (6), and edges of a bent area of the transitional part (6) grip the channel edges.
2. Section-connecting element (1, 51, 53) according to claim 1, **characterized in that** a bending area designed to bend has a substantially constant width (42) that is slightly greater than the channel edge distance (35), and the width from the bending area towards the end part (4) gradually decreases to less than the channel edge distance (35).
3. Section-connecting element (1, 51, 53) according to a preceding claim, **characterized in that** a bending area designed to bend has a weakening (14).
4. Section-connecting element (1, 51, 53) according to a preceding claim, **characterized in that** the end part (5) has a reinforcement (11) extending in the longitudinal direction of the respective leg (2).
5. Section-connecting element (1, 51, 53) according to a preceding claim, **characterized in that** at a point where the legs (2) meet a tooth (45) is formed in such a way that, after a leg (2) has been slid into a channel (21) of the section (20), the tooth extends against, but at most over the thickness of a wall (23) of the channel.
6. Section-connecting element (1, 51, 53) according to claim 5, **characterized in that** a recess (48) is formed next to the tooth (45).
7. Section-connecting element according to a preceding claim, **characterized in that** it is an upright corner element (1) in which the main surfaces of the

legs (2) are situated in the same geometrical plane.

8. Section-connecting element according to one of claims 1 to 6, **characterized in that** it is a straight element (51) whose legs (2) lie in line with each other. 5
9. Section-connecting element according to one of claims 1 to 6, **characterized in that** it is a horizontal corner element (53) in which the main surfaces of the legs (2) cross each other. 10

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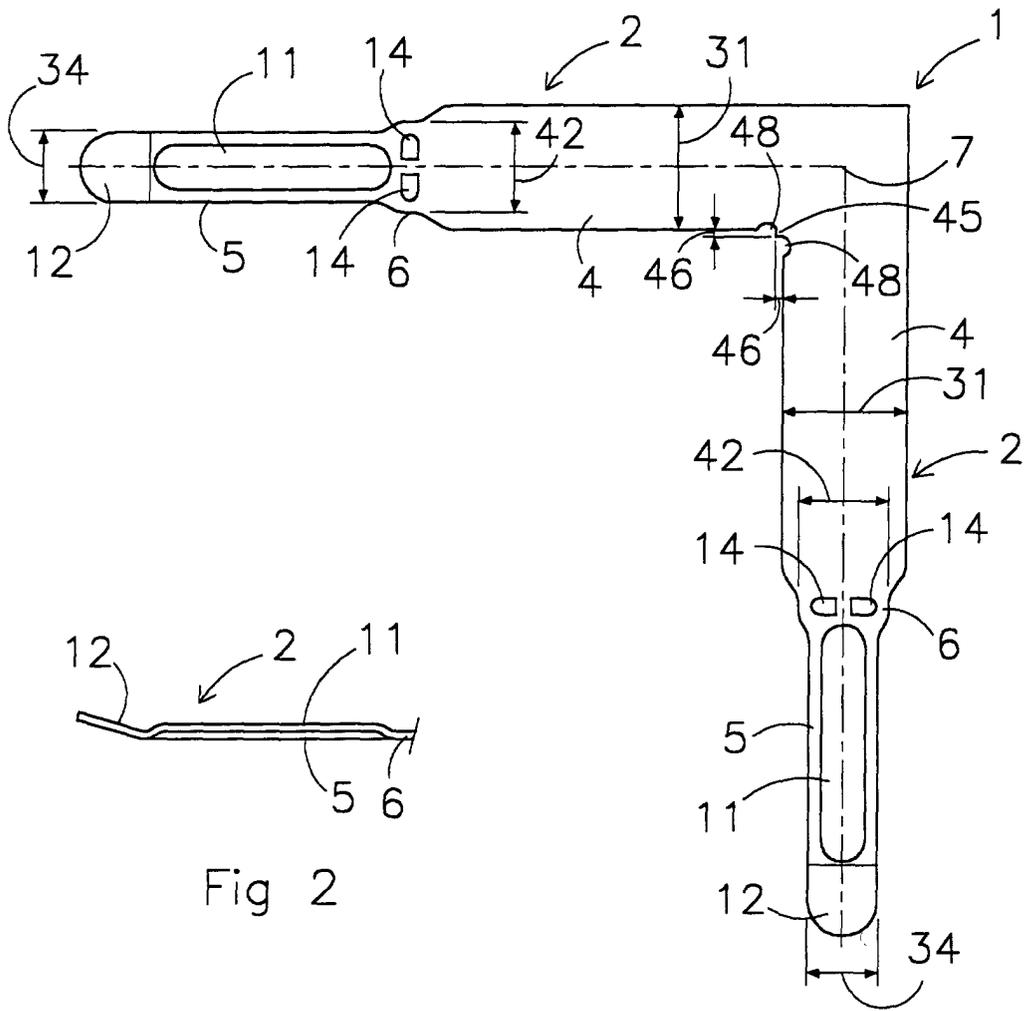


Fig 1

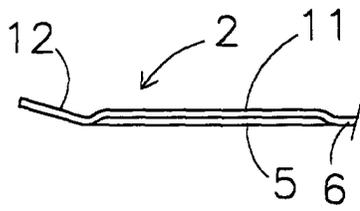


Fig 2

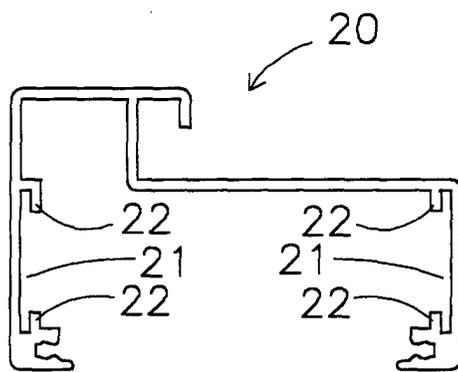


Fig 3

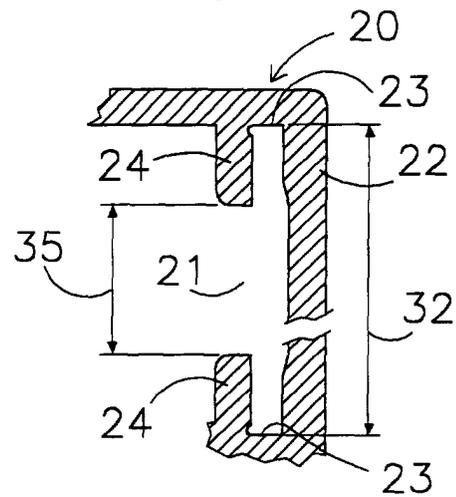


Fig 4

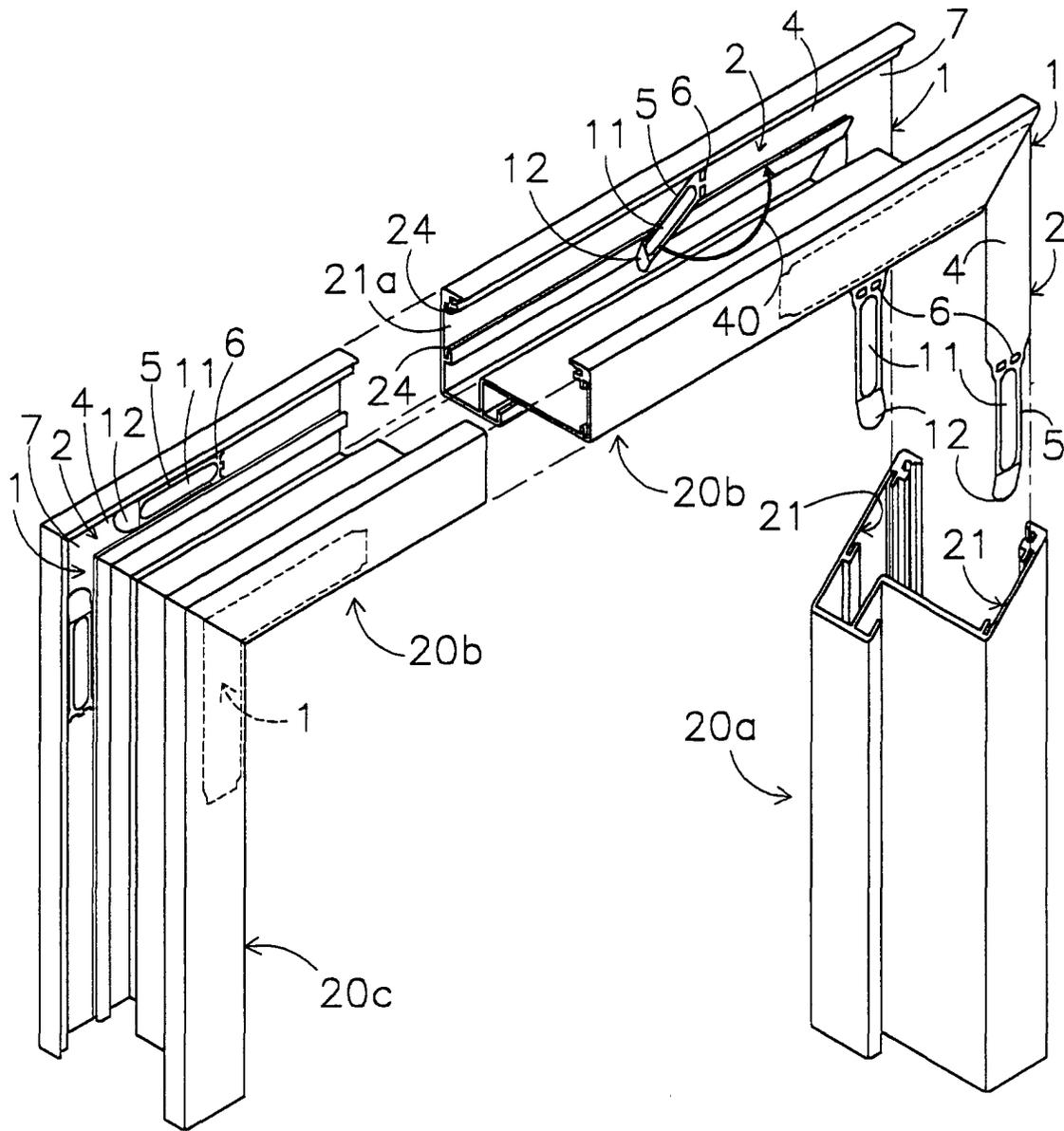
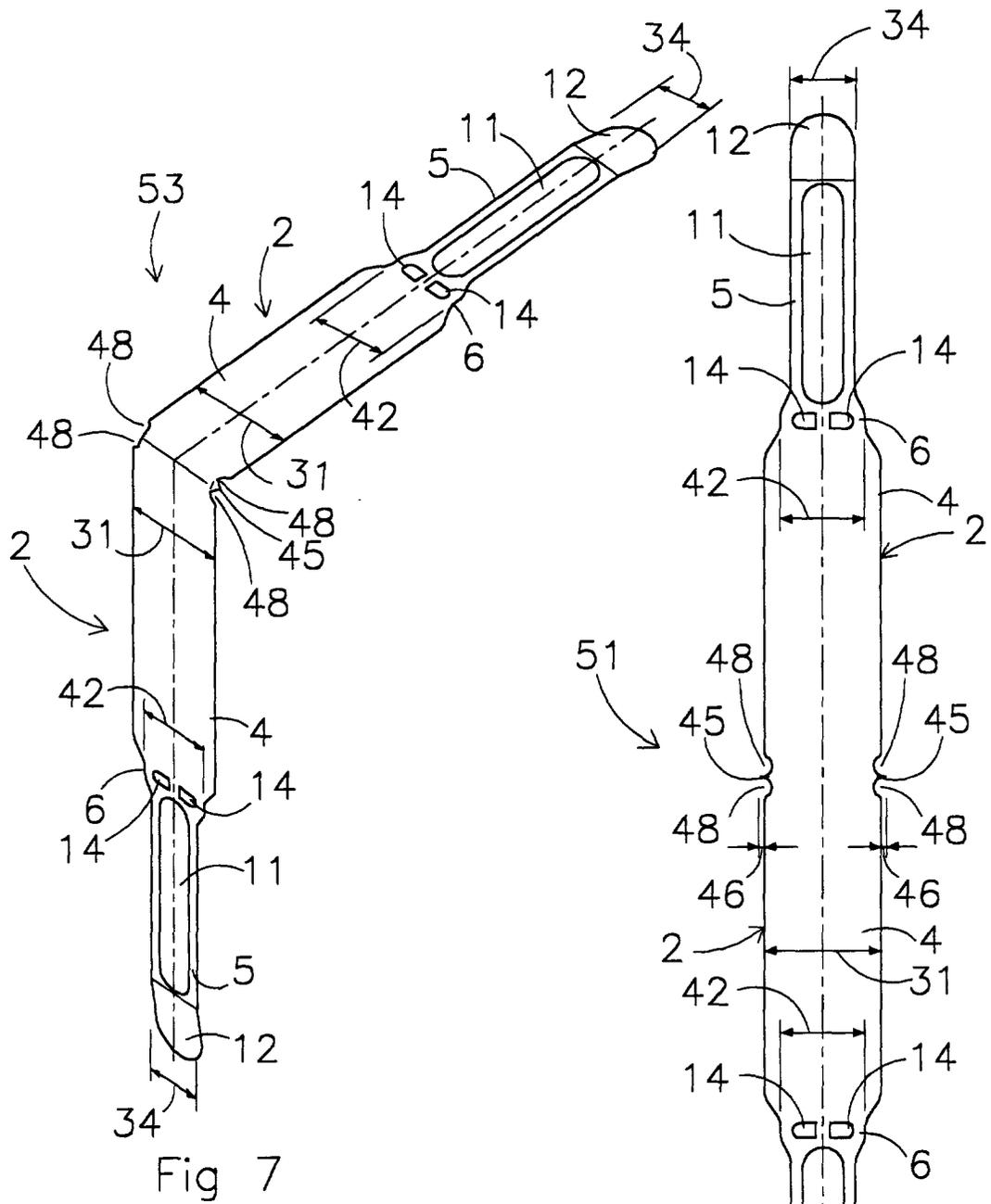


Fig 5





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 1329

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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F16B A47G E06B F16L
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		31 July 2001	Ottesen, R
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