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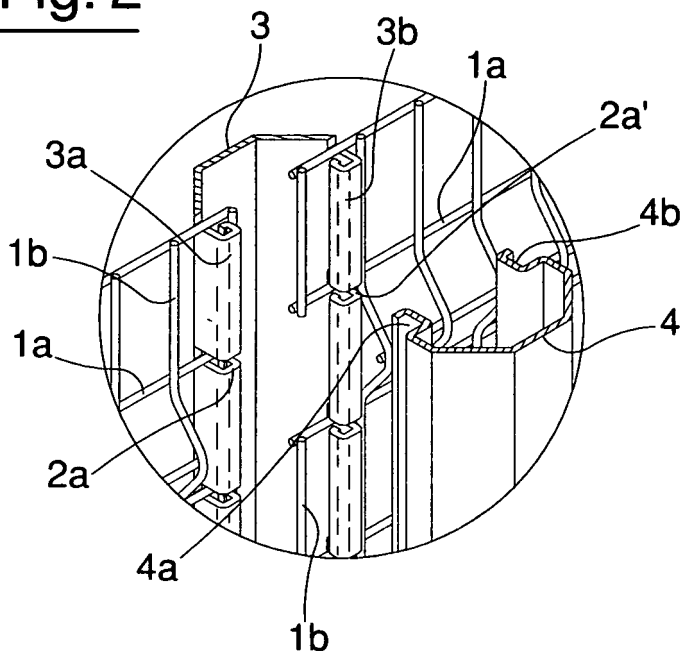
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(54) **Post for realising metal fences**

(57) The invention concerns a post for making metal fences which are formed of flat panels (1), made with electrically-welded horizontal (1a) and vertical (1b) metal wires fixed to posts (2) which in their turn are fixed to the ground at one of their ends. The post comprises a first shell (3) provided with two longitudinal ends (3a, 3b) pro-

filed to form longitudinal recesses (3a', 3b') to accept each a vertical wire (1b) on the panel, and a second shell (4) provided with two longitudinal ends (4a, 4b) profiled to form longitudinal recesses (4a', 4b') to accept each an end (3a, 3b) of the first shell and allow a stable connection between the first and the second shell so as to constitute a tubular post with a closed lateral surface.

Fig. 2



Description

[0001] The present invention concerns a post for realising metal fences.

[0002] Panels have been in use for some time for making metal fences, made of electrically-welded metal wires, which in the process of erecting the fence are fixed to posts, also made of metal, in various ways; both the panels and the posts are normally, if not always, coated with plastic.

[0003] The panels are elements with generally flat extension and are made by means of intersections of horizontal and vertical wires which are electrically welded in the process of making the panel itself; very often, in order to obtain greater rigidity for the panel, its flat structure is modified by inserting ribs of various shapes and dimensions; these ribs are obtained by bending the vertical wires, and are arranged over rows normally parallel to and spaced apart from each other, forming structures (usually of triangular section), protruding from the plane of the panel, to whose vertex a corresponding horizontal wire is welded. One example of the type of ribs used, which are however known and widely used for these panels, is visible in the figures.

[0004] Fences of this type are generally erected by fixing a post, connecting one side of a panel to the post, connecting a second post to the other side of the panel, fixing the second post, connecting one side of another panel to the second post, and so on. The posts can be sunk into the ground or can be fixed to supports anchored to fixed structures, such as for example low concrete walls.

[0005] The method of fixing the panels to the fence posts depends obviously on the structure and conformation of the post itself.

[0006] The disadvantages that posts of known type entail in the erection of fences of this type are due principally to the difficulty of making posts, of special type, not suitable for erecting both horizontal parts of a fence and parts at an angle; to the difficulty of fixing the panels to the posts; and to the necessity, during assembly, to use special tools or fixing elements for securing the panels to the posts. Other disadvantages which some known posts present are those of not having the appearance of closed tubing, in other words of being open in a longitudinal direction (axial direction of the post) and of having irregular shapes not always aesthetically pleasing. An object of the present invention is to eliminate the disadvantages indicated above by providing posts for making a fence of the type described, which once assembled, present closed and standardised sections and which do not require the use of special tools or special fixing elements to secure the panels to the posts.

[0007] A considerable advantage of the invention is that, once one end of a panel has been fixed to a post, and while waiting for the other end to be fixed to the next post, a "self-supporting" intermediate structure is formed, which therefore allows the complete fence to be assembled by just one person.

bled by just one person.

[0008] A further advantage of the invention in question is that of permitting the reuse of at least some constituent elements of the post, even after the post has been fixed immovably to the ground.

[0009] These objects and advantages are all achieved by the invention in question as it is characterised in the claims set out below.

[0010] Further characteristics and advantages of the present invention will appear more clearly from the detailed description which follows of an embodiment of the invention in question, illustrated by way of nonlimiting example in the attached figures, in which:

- figure 1 shows a perspective view of part of a fence with some panels connected to posts and with two posts in which the post itself is not yet completely assembled;
- figure 2 shows a perspective view, with some parts sectioned, of a detail of a post with two panels partially inserted and with the second shell detached;
- figure 3 shows a top view, in section, of the post in the configuration shown in figure 2;
- figure 4 shows a perspective view, with some parts sectioned, of a detail of a post with two panels inserted and with the second shell connected to the first shell;
- figure 5 shows a top view, in section, of the post in the configuration shown in figure 4;
- figure 6 shows a section, on an enlarged scale and executed with a horizontal plane passing through the openings in the first shell, of the first and second shell of the post, disconnected from each other. Figure 1 illustrates part of a metal fence which is made using elements consisting of panels 1 and posts 2. The panels 1 are substantially flat and are made with horizontal 1a and vertical 1b wires, electrically welded; the horizontal and vertical wires of the panels, normally of circular section and of a few millimetres in diameter, are electrically welded in the process of manufacture of the panel itself using normal machines for the manufacture of electrically welded meshes. In order to obtain greater rigidity for the panel, it is possible to modify the flat structure of the panel by inserting ribs, which can be of various shapes and dimensions, obtained by bending the vertical wires; the ribs are arranged over rows normally parallel to and spaced apart from each other, forming structures protruding from the plane of the panel, to whose vertex a corresponding horizontal wire is welded. An example of these ribs is illustrated in the panels in figure 1. The posts 2 are generally elements with longitudinal extension and are variously shaped so as to be able to connect the panels to them in order to obtain the fence; these posts are fixed to the ground and are normally sunk into the soil or fixed to supports anchored to fixed structures, such as for example low concrete walls. Both the

panels and the posts are normally, if not always, coated with plastic. What is said above forms part of the known art, widely used for these kinds of fence. Each of the posts 2 which are the subject of the present invention comprises a first shell 3 which has vertical extension and is open on one side; the first shell has a lateral surface which, excluding the end walls which will be discussed below, has a section in the form of half a regular octagon.

[0011] The first shell is provided with two ends, respectively 3a and 3b, which have longitudinal extension, are profiled and each form a longitudinal recess, respectively 3a' and 3b', each of which is shaped so as to accept a vertical wire 1b of the panel, in particular each of the vertical end wires of the panels.

[0012] Each of the recesses 3a' and 3b' is formed by a first wall, respectively 33a and 33a', which is connected to the lateral wall of the shell and is located in a direction axial to the shell itself; in practice therefore the first walls 33a and 33a' are located perpendicularly to the lateral wall of the first shell, both run in the same direction, and are located facing each other. Each of the recesses 3a and 3a' also comprises a second wall, respectively 33b and 33b', each of which is connected to the end of the respective first wall 33a and 33a' and is located towards the inside of the shell in a direction roughly parallel to the lateral surface of the shell itself; these two walls are therefore substantially parallel to each other.

[0013] Each of the recesses 3a and 3a' furthermore comprises a third wall, respectively 33c and 33c', which is connected to the end of the second wall and is located roughly parallel to the respective first wall; each of the third walls is turned towards the outer wall of the respective end of the shell and, for reasons which will be better clarified below, terminates at a distance from this outer wall of the shell which is greater than the diameter of the vertical end wires of the panel.

[0014] The first shell may be obtained in any way whatsoever; a very quick and easy way is to bend a sheet along the areas of contact between the vertical walls which form the lateral surface of the shell and the walls of the recesses at the terminal ends of the shell itself in such a way as to obtain a profiled shape which as a result is open in the area between the two second walls 33b and 33b'.

[0015] In each end of the first shell, openings are formed, respectively 2a and 2a', which are located in a direction transverse to the ends and which are spaced apart from each other, in a longitudinal direction, by the same distance as there is between the horizontal wires of the panel. The openings are formed by cutting all the walls at the ends of the shell, obviously in the area where it is desired to make the opening, and at least part of the lateral end wall of the shell itself; the dimensions of each opening, in particular its width in a longitudinal direction, are such as to allow a horizontal wire on the panel to pass through.

[0016] Each of the posts 2 which are the subject of the present invention comprises a second shell 4 with vertical extension, which is open on one side and is provided with two longitudinal ends, respectively 4a and 4b, which are profiled and which each form a longitudinal recess, respectively 4a' and 4b', each of which is shaped so as to accept an end, respectively 3a and 3b, of the first shell. The second shell, too, has a lateral surface which, excluding the end walls which will be discussed below, has a section in the form of half a regular octagon.

[0017] Each of the recesses 4a' and 4b' is formed by a first wall, respectively 44a and 44a', which is connected to the lateral wall of the shell and is located in a direction axial to the shell itself; in practice therefore the first walls 44a and 44a' are located perpendicularly to the lateral wall of the second shell, both run in the same direction, and are located facing each other.

[0018] Each of the recesses 4a and 4a' also comprises a second wall, respectively 44b and 44b', each of which is connected to the end of the respective first wall 44a and 44a' and is located towards the outside of the shell in a direction roughly parallel to the lateral surface of the shell itself; these two walls are therefore substantially parallel to each other.

[0019] Each of the recesses 4a and 4a' furthermore comprises a third wall, respectively 44c and 44c', which is connected to the end of the second wall and is located roughly parallel to the respective first wall; each of the third walls is turned towards the outer wall of the respective end of the shell.

[0020] The second shell, too, similarly to the first, can be obtained by bending a sheet along the areas of contact between its various vertical walls.

[0021] For reasons which will be better clarified below, the distance between the ends of the third walls 44c and 44c' of the second shell is greater than the distance between the second walls 33b and 33b' of the first shell, i.e. than the width of the opening between these two walls, but is greater than this distance by an amount less than the elastic deformation, in a radial direction, of the second shell.

[0022] The first and second shells of the post are connected to each other along a vertical diametral plane; for this purpose the two shells which constitute the post have ends which are a sort of guide, internal to the first shell and external to the second shell, and are coupled together by inserting the ends of the first shell into the ends of the second shell, to connect the two shells together. When the first and second shells are connected together, they constitute a tubular post with closed lateral surface which, given the shape of the two shells and the fact that the ends inserted into each other are inside the post, has a regular octagonal external section. Naturally, it is possible to make the shells of the posts with the section of their lateral surface different from the half octagon described; the shells can in fact have a lateral surface section that is semicircular, half a square, rectangular, hexagonal, or other shapes of section.

[0023] Once the post has been formed by the union of the two shells, in order to avoid the possibility of rainwater running down the inside, the top of the post can be closed with a cap, not illustrated in the figures, an item however which is common for hollow posts exposed to atmospheric agents; in order to avoid any water entering through holes 2a and 2a' from collecting inside the post, a through aperture can conveniently be provided at the lower end of the post, not illustrated in the figure but formable in one of the two shells, to allow the exit of any water inside the post itself.

[0024] The procedure for erecting fences using the posts in question is as follows: note that the panels to be connected to these posts must be missing the end part of any horizontal reinforcing ribs.

[0025] The first shell of a post is fixed to the ground, sinking it into the soil or fixing it to supports anchored to fixed structures, such as for example low concrete walls; if there are fragments of pre-existing posts, the structure of the shell can often allow the shell to be fixed to the pre-existing fragments, for example by bolts, welding or poured concrete as necessary.

[0026] One side of a panel is then connected to the shell, by inserting the horizontal wire into the apertures 2a (or 2a') at one end of the shell, and the last vertical wire is inserted into the recess at the end of the shell; this last operation can be carried out very simply by fitting the vertical wire into the space between the third wall of the recess and the outer wall of the shell, a space which as we have said is larger than the diameter of the vertical wires at the end of the panel.

[0027] In the case of rectilinear portions of fence, the panel will be left running in a direction radial to the shell; in other cases it is rotated to the desired angle.

[0028] Once one side of the panel has been connected to a fixed shell, the panel is self-supporting and does not need a person or any equipment to remain in position; this allows the erection of the fence by a single person without any special equipment.

[0029] A further first shell is then connected to the other side of the panel, which is still free; this operation is performed in the same way as described above. The further first shell is then pulled, so as to put the panel under tension, and is subsequently fixed to the ground. In this way the panel is definitively connected to the two first shells and can no longer be removed, except obviously if it is cut or a shell uprooted, since the vertical wires inserted into the recesses in the shells cannot come out of them.

[0030] Starting from one shell, the operations described are then repeated, using other panels and other first shells, so as to erect the fencing along the desired perimeter.

[0031] At this point it is possible to connect the second shells to the first shells so as to form closed octagonal posts which are less exposed to atmospheric agents and are more aesthetically pleasing; the operation of connecting the second shells to the first is performed very

simply either by sliding the recesses of the second shells onto the outside of the first shells from above, or by inserting the third wall of a second shell behind the third wall of a first shell and exerting a light radial pressure on the second shell so as to cause an elastic deformation which will allow the other recess of the second shell to snap into place in the other recess of the first shell. These ways of operating are both illustrated in figure 1, in which the arrows indicate the direction of the connection. It is scarcely necessary to observe that the connection between the first and second shells can be made either when the fence is completed or when each first shell is fixed to the ground.

[0032] One advantage of the posts described is that they allow the second shells to be re-used, even in the event that the fence is modified or some of the first shells are replaced.

[0033] The possibility of removing the connection between the shells makes it much easier to replace any fence panels which get damaged, especially in cases where these panels have even the smallest possibility of being deformed in a horizontal direction.

Claims

1. Post for making metal fences of the type comprising substantially flat panels (1), made with electrically-welded horizontal (1a) and vertical (1b) metal wires, which in the process of erecting the fence are fixed to posts (2) which in their turn are fixed to the ground at one of their ends, **characterized in that:** the post comprises a first shell (3) with vertical extension, which is open on one side and provided with two longitudinal ends (3a, 3b) which are profiled and which each form a longitudinal recess (3a', 3b') shaped so as to accept a vertical wire (1b) of the panel; at each end (3a, 3b), apertures (2a, 2a') are formed which are located in a direction transverse to the ends and which are spaced apart from each other, in a longitudinal direction, by the same distance as there is between the horizontal wires of the panel, the dimensions of the apertures being suitable for allowing the passage of a horizontal wire; the post comprises a second shell (4) with vertical extension, which is open on one side and provided with two longitudinal ends (4a, 4b) which are profiled and which each form a longitudinal recess (4a', 4b') each shaped so as to accept an end (3a, 3b) of the first shell; when the ends of the first shell are inserted into the ends of the second shell, the first and second shells result in being stably connected to each other so as to constitute a tubular post with closed lateral surface.
2. Post according to claim 1, **characterised in that:** the first and second shells of the post are connected to each other along a vertical diametral plane; each

of the recesses (3a', 3b') on the first shell is formed by a first wall (33a, 33a'), connected to the lateral wall of the shell and located in a direction axial to the shell itself, by a second wall (33b, 33b'), connected to the end of the first wall and located towards the inside of the shell in a direction roughly parallel to the lateral surface of the shell itself, and by a third wall (33c, 33c'), connected to the end of the second wall and located roughly parallel to the first wall, which is turned towards the outer wall of the shell and which terminates at a distance from this outer wall of the shell greater than the diameter of the vertical wires in the panel; each of the recesses (4a', 4b') on the second shell is formed by a first wall (44a, 44a'), connected to the lateral wall of the shell and located in a direction axial to the shell itself, by a second wall (44b, 44b'), connected to the end of the first wall and located towards the outside of the shell in a direction roughly parallel to the lateral surface of the shell itself, and by a third wall (44c, 44c'), connected to the end of the second wall and located roughly parallel to the first wall, which is turned towards the outer wall of the shell; the distance between the ends of the third walls (44c) and (44c') of the second shell is greater than the distance between the second walls (33b) and (33b') of the first shell.

3. Post according to claim 2, **characterised in that** the distance between the ends of the third walls (44c) and (44c') of the second shell is greater than the distance between the second walls (33b) and (33b') of the first shell by an amount less than the elastic deformation of the second shell in a radial direction.
4. Post according to claim 1, **characterised in that** the first and the second shells have a lateral surface which has a section in the shape of half a regular octagon.

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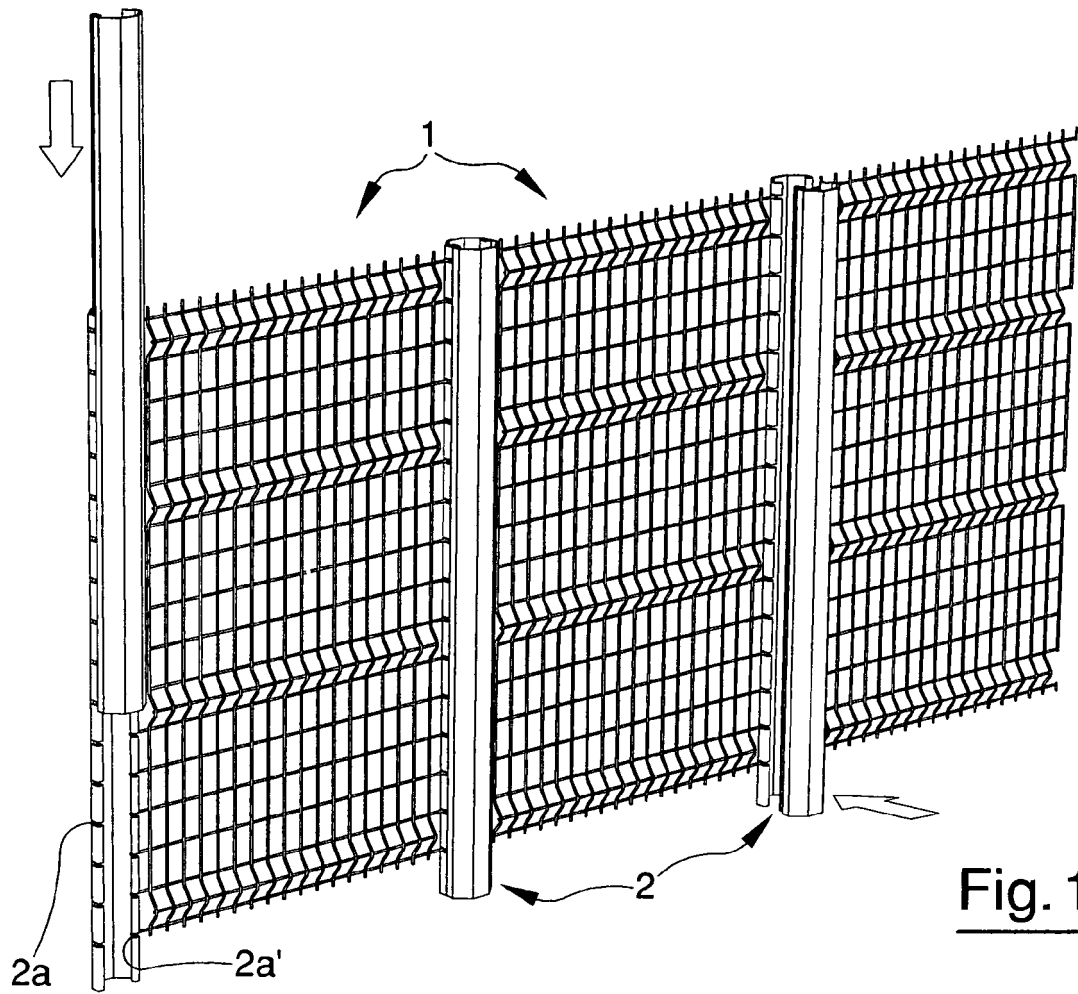


Fig. 1

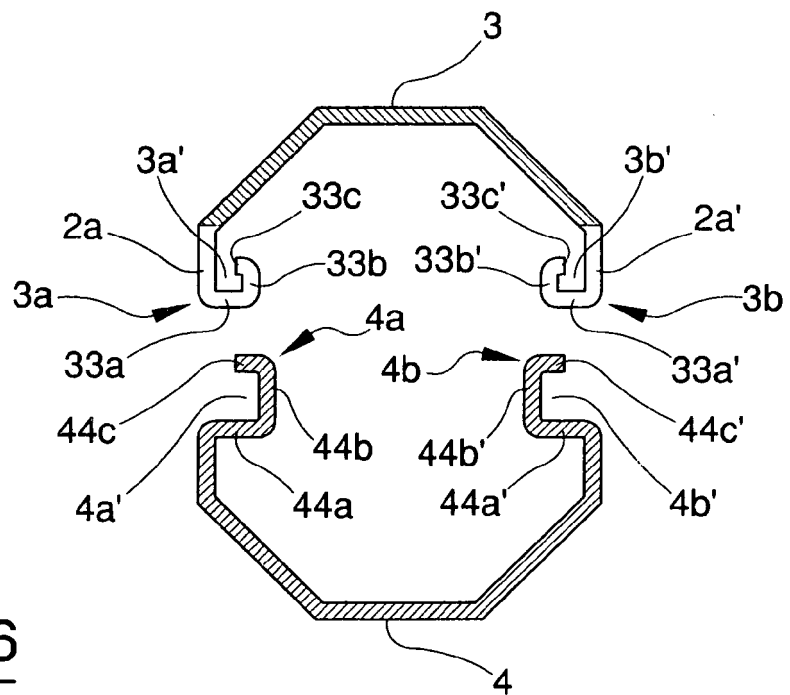


Fig. 6

Fig. 2

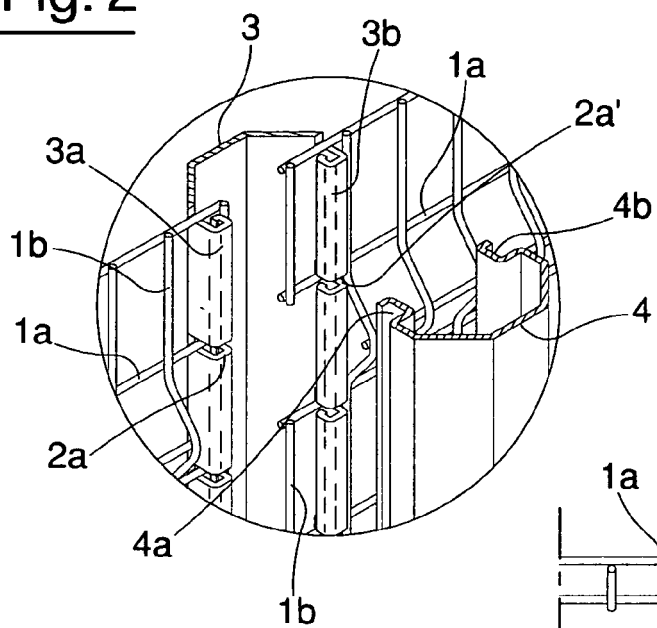


Fig. 3

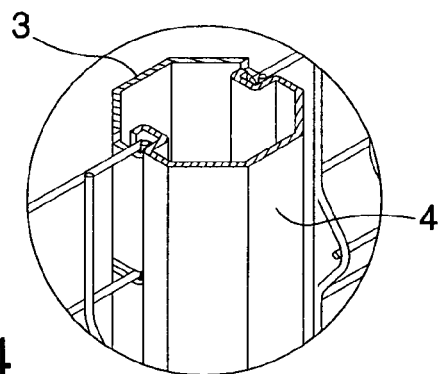
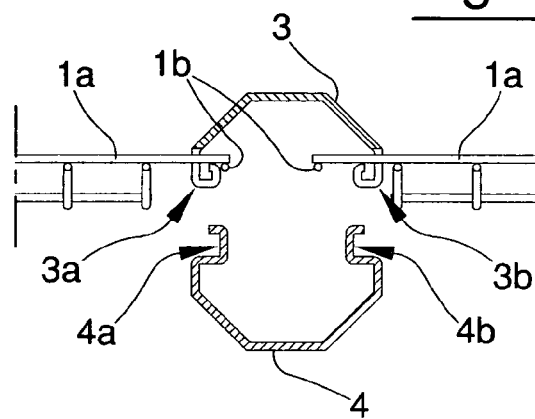


Fig. 4

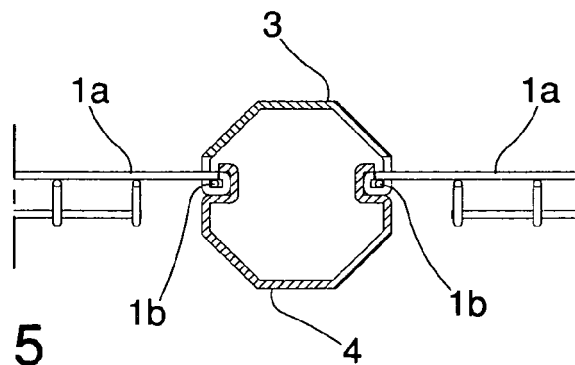


Fig. 5



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 42 5749

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 780 432 A (EUROFENCE [FR]) 31 December 1999 (1999-12-31) * page 1, line 1 - line 2 * * page 2, line 4 - line 33 * * figures 1,2 *	1	INV. E04H17/06 E04H17/16 E04H17/20
A	----- EP 0 359 346 A (HABERLE LUDWIG) 21 March 1990 (1990-03-21) * figure 1 *	1,3	
A	----- GB 24276 A A.D. 1913 (SMITH AND PEARSON LTD; JOHN BIGLANDS PEARSON) 27 August 1914 (1914-08-27) * figures 2,3,5 *	1	

			TECHNICAL FIELDS SEARCHED (IPC)
			E04H
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		13 March 2008	Schmidt, Carola
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			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 42 5749

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
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13-03-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2780432	A	31-12-1999	NONE	
EP 0359346	A	21-03-1990	DE 3824721 A1 ES 2027444 T3	12-04-1990 01-06-1992
GB 191324276	A	27-08-1914	NONE	