



(11) **EP 1 992 769 A1**

(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 158(3) EPC

(43) Date of publication:  
**19.11.2008 Bulletin 2008/47**

(51) Int Cl.:  
**E04H 17/08<sup>(2006.01)</sup> E04H 17/10<sup>(2006.01)</sup>**  
**E04H 17/20<sup>(2006.01)</sup>**

(21) Application number: **07730352.7**

(86) International application number:  
**PCT/ES2007/000111**

(22) Date of filing: **01.03.2007**

(87) International publication number:  
**WO 2007/099187 (07.09.2007 Gazette 2007/36)**

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

(72) Inventor: **SERRANO VICARIO, Carlos**  
**E-09001 Burgos (ES)**

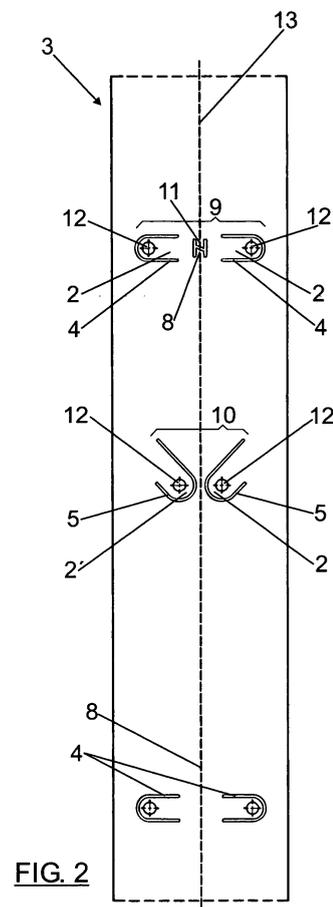
(30) Priority: **03.03.2006 ES 200600530**

(74) Representative: **Carvajal y Urquijo, Isabel et al**  
**Clarke, Modet & Co.**  
**C/Goya 11**  
**28001 Madrid (ES)**

(71) Applicant: **Grupo Carlos Serrano Vicario, S.L.**  
**09001 Burgos (ES)**

(54) **MANUFACTURING METHOD AND MULTIFUNCTIONAL TUBULAR POST FOR FENCES OBTAINED BY MEANS OF SAID METHOD**

(57) The invention relates to a manufacturing process and a multifunctional tubular post for fences obtained thereby, the posts (1) being used as support for a fence with wire netting, each of the posts having a plurality of joining elements (2-2'), the process comprising the steps of cutting from a laminated sheet reel a sheet portion (3), folding said sheet portion until achieving a tubular body, the free ends thereof being opposite, and joining said free ends. The process additionally comprises a cold-forming step between the cutting step and the folding step in order to define a plurality of grooves (4-5), the position and shape of which coincide with the position and shape of the joining elements (2-2'), the length of the mentioned grooves (4-5) being equivalent to the length of the outer contour of the joining elements (2-2').



**FIG. 2**

**EP 1 992 769 A1**

## Description

### Field and Object of the Invention

**[0001]** The invention is comprised within the field of manufacturing elements used in enclosures or fences for any premises and more specifically it relates to a process for manufacturing a multifunctional tubular post for fences and to the post itself, which will be used as a vertical support element for wire netting, meshes and the like used in these types of fences.

### State of the Art

**[0002]** Different systems used in fences or enclosures for premises are currently known, in most of the cases said systems are made up of a plurality of intermediate posts which are fixed to the ground and on which a mesh or wire netting is hung, the mentioned posts serving as support elements of said wire netting.

**[0003]** The constitution of the mentioned posts is very diverse, they are normally tubular posts made from galvanized steel the section of which is normally circular, said posts have a series of tabs independent from the body of the post welded to said body, located such that they project therefrom and having as a main purpose that of being used as connection elements for the posts, on one hand with the bracing wires forming the fence and on the other hand with the actual mesh or wire netting.

**[0004]** The mentioned posts are manufactured starting from a laminated sheet reel, said sheet then being cut into portions the width of which is equivalent to the length of the circumference encircling the post, it is subsequently folded by means of a shaper of said sheet portion until achieving a tubular body, the free ends thereof being opposite, to finally join said free ends either by direct welding or by means of overlapping in order to thus form the tubular post.

**[0005]** The different tabs which the post will have are subsequently welded, said tabs are no more than sheet pieces with different shapes which usually have orifices for the connection thereof to bracing elements or directly to bracing wires on which the wire netting is placed.

**[0006]** Different types of posts will normally be used while installing an enclosure or fence depending on their relative position therein and on their function, there being the following types of posts:

- Starting post, used at the start of a fence such as for example for the cases in which the post is located near a door for accessing the fenced premises.
- Reinforcement post, it is located in an intermediate manner between starting posts and has tabs being useful as reinforcement for very long fences.
- Strut post, they are posts without tabs which are placed inclined, being supported on corner and reinforcement-type posts, increasing the stability thereof.

- Corner post, it is a specific type of the reinforcement post which is used when there is a change, normally a right-angle change, in the direction of the fence, having tabs forming a certain angle between one another and with respect to the post, the strut posts being joined to said tabs.

- Alignment post, it is located in an intermediate manner but does not have tabs therefore it only acts as an alignment element and not as a reinforcement element, it usually has grooves through which the bracing wires pass, which wires are not fixed to the post.

**[0007]** As can be observed, each of the described posts needs a different number of tabs as well as a position which is also different depending on the type of post, due to this circumstance it is necessary to manufacture each type of post separately since it is necessary to join the tabs corresponding to each type of post in an additional step independent from the rest of the manufacturing process and therefore the manufacturing process is made more complicated as well as more expensive.

**[0008]** Due to the above, a need has been detected to provide a very simple process for manufacturing tubular posts which, starting from a single sheet portion, achieves producing the five types of posts described without needing to carry out an independent welding step between the post and the mentioned tabs, and therefore simplifying the production process as well as the necessary installations, not having to set up independent production lines for each of the five types of posts.

**[0009]** This objective is achieved by means of the invention as it is defined in claim 1, and preferred embodiments of the invention are defined in the dependent claims.

### Description of the Invention

**[0010]** The present invention relates to a process for manufacturing a multifunctional tubular post for fences, as well as the post obtained by means of the mentioned process, the posts being of the type of those used for supporting a fence with wire netting, each of the posts having a plurality of joining elements for their connection with the bracing wires, with the actual mesh and with other tubular posts.

**[0011]** The normal process for manufacturing one of these tubular posts usually comprises the following steps:

- cutting from a laminated sheet reel a sheet portion with a width equivalent to the length of the perimeter of the post,
- folding said sheet portion until achieving a tubular body, the free ends thereof being opposite
- joining the free ends in order to form the tubular post

**[0012]** A first aspect of the invention relates to the fact that the process is characterized in that between the cutting step and the folding step a cold-forming step is carried out in order to define a plurality of grooves, each of which has a position and shape coinciding with the position and shape of each of the joining elements of the post, the length of the mentioned grooves being equivalent to the length of the outer contour of the joining elements.

**[0013]** After the joining step for joining the free ends in order to form the tubular post, a step is carried out during which the connection area of said joining elements is bent with respect to the tubular post in order to thus unfold the ends of the corresponding joining elements.

**[0014]** Thus and depending on whether or not either joining elements are unfolded and also depending on the angle of the fold which is made, the different types of mentioned posts can be obtained starting from a same sheet portion by only adding one step to the process.

**[0015]** Said step consists of making a series of grooves coinciding with the shape and outer dimensions of the joining elements, such that the joining elements are delimited or rather defined on the contour of the post once the sheet has been folded, said joining elements being unfolded in situ, i.e. in the place in which the fence is assembled, it therefore not being necessary to carry out an additional welding step for welding the joining elements or tabs to the tubular post.

**[0016]** In the mentioned cold-forming step, several U-shaped grooves are made, on one hand at least one pair of grooves separated a certain distance from one another is made, the side branches of the U corresponding to each of the two grooves being aligned respectively according to a direction perpendicular to the axis of rotation of the tubular post. The grooves will be located symmetrically with respect to a plane passing through the mentioned axis of rotation and a point located halfway on the separation distance between both grooves, a first type of pairs of joining elements being defined.

**[0017]** In addition, at least one pair of grooves separated a certain distance is made in which the central branches of the U corresponding to each of the two grooves are opposite and their respective side branches are inclined with respect to the axis of rotation of the tubular post, said grooves being symmetrically located with respect to a plane passing through the mentioned axis of rotation and a point located halfway on the separation distance between both grooves, a second type of pairs of joining elements being defined.

**[0018]** The joining elements corresponding to the first type of pairs will be intended to join the bracing elements of the mesh to the post to which the bracing wire is connected and in turn the joining elements corresponding to the second type of pairs will be intended to join the strut-type post in order to aid in supporting the post.

**[0019]** A second type of pairs of joining elements can be arranged between two first types of pairs of joining elements in the direction of the axis of rotation of the

tubular post, a grouping of joining elements being defined located at the upper portion of the tubular post taken once it has been fixed to the ground.

**[0020]** Additionally, grooves which are arranged between two grooves of those previously mentioned, the shape thereof being an H-shape, can be made.

**[0021]** The main purpose of these grooves will be to be used as alignment means since the bracing wire will be passed therethrough, such wire not being joined to the post but rather such grooves being passed through by such wire.

**[0022]** A final aspect of the invention relates to a multifunctional tubular post for fences manufactured according to the described process which is characterized in that the joining elements of the tubular post are formed on the actual post by means of making a plurality of grooves on the sheet portion forming the planar development of the tubular post in a cold-forming step.

#### Description of the Drawings

**[0023]** A series of drawings will be very briefly described below which aid in better understanding the invention and which are specifically related to several embodiments of said invention, presented as illustrative and non-limiting examples thereof.

Figure 1 depicts a plan view of a sheet portion corresponding with the planar development of the tubular post object of the present invention.

Figure 2 depicts a view on a larger scale of part of the sheet portion depicted in Figure 1.

Figure 3 depicts a perspective view of the upper area of a tubular post manufactured according to the process object of the present invention when the joining elements of said post are unfolded.

Figure 4 depicts a perspective view of the upper area of a tubular post manufactured according to the process object of the present invention when the joining elements of said post are not unfolded.

Figure 5 depicts a front elevational view of several types of posts obtained by means of the process object of the present invention.

#### Description of Embodiments of the Invention

**[0024]** The post manufactured by means of the process object of the present invention is multifunctional, meaning that different types of posts each of which will have a different function can be obtained starting from a same manufacturing process.

**[0025]** These posts are used as support in fences formed by wire netting, for which said posts must have a series of joining elements for their connection with bracing wires or in their absence bracing elements of said wires, with the actual mesh and with other tubular posts, normally strut type posts.

**[0026]** According to the process object of the present

invention, the starting point will be a series of known steps listed below:

First a sheet portion (3) is obtained by cutting from a laminated sheet reel, the width of said portion coinciding with the length of the perimeter of the post (1).

**[0027]** Said sheet portion is subsequently folded until achieving a tubular body, the free ends thereof being opposite, said folding being carried out by means of a sheet shaper for example.

**[0028]** Finally, the free ends are joined in order to form the tubular post (1), said joining is usually carried out by means of welding said edges which can be one after another or overlapping one another.

**[0029]** The process for manufacturing multifunctional tubular posts object of the present invention differs from the processes known up until this moment in that it incorporates a new step between the cutting and folding steps, said step consisting of making a plurality of grooves for the purpose of defining the joining elements (2).

**[0030]** Two types of grooves are normally made, a first type of groove (4) each of which has a position and shape coinciding with the position and shape of each of the joining elements (2) of the post (1), the length of the mentioned grooves (4) being equivalent to the length of the outer contour of the joining elements (2).

**[0031]** In this particular case, as observed in Figure 2, different pairs of grooves (4) will be made, a first type of pairs of grooves separated a certain distance is depicted at the upper part, both grooves (4) having a horizontal U-shape, being located symmetrically with respect to a plane (13) passing through the axis of rotation (7) of the post (1) and through a point located halfway on the separation distance between both grooves (4), such that both side branches of the U of each of the grooves (4) are lengthened and opposite one another and in a horizontal position. The shape of the grooves (4) will always be adapted to the shape which the joining elements (2) must have, the U-shape of the present embodiment being a materialization by way of example and in no case being limiting.

**[0032]** Additionally and on the sheet surface delimited by each one of the grooves (4) at least one borehole (12) is made, the main purpose of which is to be used as a means for joining the post (1) to bracing elements (not depicted in the figures) and directly to the bracing cable once the corresponding joining element (2) has been unfolded. The number of orifices (12) can be variable, several boreholes for each of the joining elements (2) being able to be made.

**[0033]** In addition, a second type of pairs of grooves (5) can be made, in which the two grooves are separated a certain distance being symmetrical with respect to the plane (13) passing through the mentioned axis of rotation (7) and a point (8) located halfway on the separation dis-

tance between both grooves (5). In this case the grooves (5) are inclined with respect to the symmetrical plane (13) and its position is inverse with respect to the position of the grooves (4) of the first type (9) of pairs of grooves, since on this occasion the central branches of each of the grooves (5) are near and the free end of the central branches of said grooves (5) is further away.

**[0034]** Additionally a plurality of grooves (11) can be made, which in this case are located between the two grooves (4) of one of the pairs of grooves of the first type (9), and which have an H-shape, being able to have any shape, said cut (11) is used as an alignment element when several aligned posts (1) are placed and the bracing wire is passed through said cuts (11). As many cuts (11) as necessary can be made and they can be located on any part of the post (1).

**[0035]** With the described configuration and position of the grooves (4-5), when the sheet portion (3) is folded to give it a shape, in this case cylindrical, and the post (1) is formed by welding its free ends, the mentioned grooves form part of the post, the joining elements (2-2') being equally curved and adhered to the body of the post (1), as seen in detail in Figure 4. When the post (1) is to be put in the ground the joining elements (2) will be unfolded by simply pulling the end of the surface delimited by the grooves (4, -5), the ends of said joining elements (2-2') of the post (1) being separated, as is shown in Figure 3, both the number and the type of joining elements (2-2') needed in each case being able to be unfolded at will in order to thus achieve different types of posts (1). Figure 5 depicts 5 of the types of posts which are usually used commonly and which are the following: starting posts (14), reinforcement posts (15), corner post (16), alignment post (17) and strut post (18).

**[0036]** In reference to the free or upper end of the post once it has been put in the ground, it can have an upper lid or be finished as depicted in the figures, i.e. by means of a flattening, the outer edge being rounded and being able to have at least one orifice, such materialization is only an embodiment, the free end of the post being able to adopt any other known configuration according to the function of the post in each case.

#### 45 Claims

1. A process for manufacturing a multifunctional tubular post for fences, the posts (1) being of the type of those used for supporting a fence with wire netting, each one of the posts having a plurality of joining elements (2-2') (tabs) for their connection on one hand with the bracing wires and on the other hand with the actual mesh, the process comprising the following steps:

- cutting from a laminated sheet reel a sheet portion (3) with a width equivalent to the length of the perimeter of the post (1),

- folding said sheet portion until achieving a tubular body, the free ends thereof being opposite
- joining the free ends in order to form the tubular post (1)

**characterized in that** between the cutting step and the folding step a cold-forming step is carried out in order to define a plurality of grooves (4-5), each of which has a position and shape coinciding with the position and shape of each of the joining elements (2-2') of the post (1), the length of the mentioned grooves (4-5) being equivalent to the length of the outer contour of the joining elements (2-2').

2. A process according to claim 1, **characterized in that** after the joining step for joining the free ends in order to form the tubular post (1), a step is carried out during which the connection area (6) of said joining elements (2) is bent with respect to the tubular post (1) in order to thus unfold the ends of the corresponding joining elements (2). 20
3. A process according to any of the previous claims, **characterized in that** in the cold-forming step, the grooves (4-5) have a U-shape. 25
4. A process according to any of the previous claims, **characterized in that** in the cold-forming step at least one pair of grooves (4) separated a certain distance from one another is made, the side branches of the U corresponding to each of the two grooves being respectively aligned according to a direction perpendicular to the axis of rotation (7) of the tubular post (1) and the grooves (4) are located symmetrically with respect to a plane (13) passing through the mentioned axis of rotation (7) and a point (8) located halfway on the separation distance between both grooves (4), a first type of pairs (9) of joining elements (2) being defined. 30 35 40
5. A process according to any of the previous claims, **characterized in that** in the cold-forming step at least one pair of grooves (5) separated a certain distance is made, wherein the central branches of the U corresponding to each of the two grooves (5) are opposite and their respective side branches are inclined with respect to the axis of rotation (7) of the tubular post (1), said grooves (5) being symmetrically located with respect to a plane (13) passing through the mentioned axis of rotation (7) and a point (8) located halfway on the separation distance between both grooves (5), a second type (10) of pairs of joining elements (2) being defined. 45 50
6. A process according to any of the previous claims, **characterized in that** in the cold-forming step, between two first types of pairs (9) of joining elements (2), a second type of pairs (10) of joining elements

(2) is arranged in the direction of the axis of rotation (7) of the tubular post (1), defining a grouping of joining elements (2) located at the upper portion of the tubular post (1) taken once it has been fixed to the ground. 5

7. A process according to any of the previous claims, **characterized in that** in the cold-forming step, grooves (11) are made which are arranged between two grooves of the first type (4-5), the shape thereof being an H-shape. 10
8. A multifunctional tubular post for fences manufactured according to the process of claims 1 to 7, **characterized in that** the joining elements (2) of the tubular post (1) are formed on the actual post, by means of making a plurality of grooves on the sheet portion (3) forming the planar development of the tubular post (1) in a cold-forming step. 15 20 25 30 35 40 45 50 55

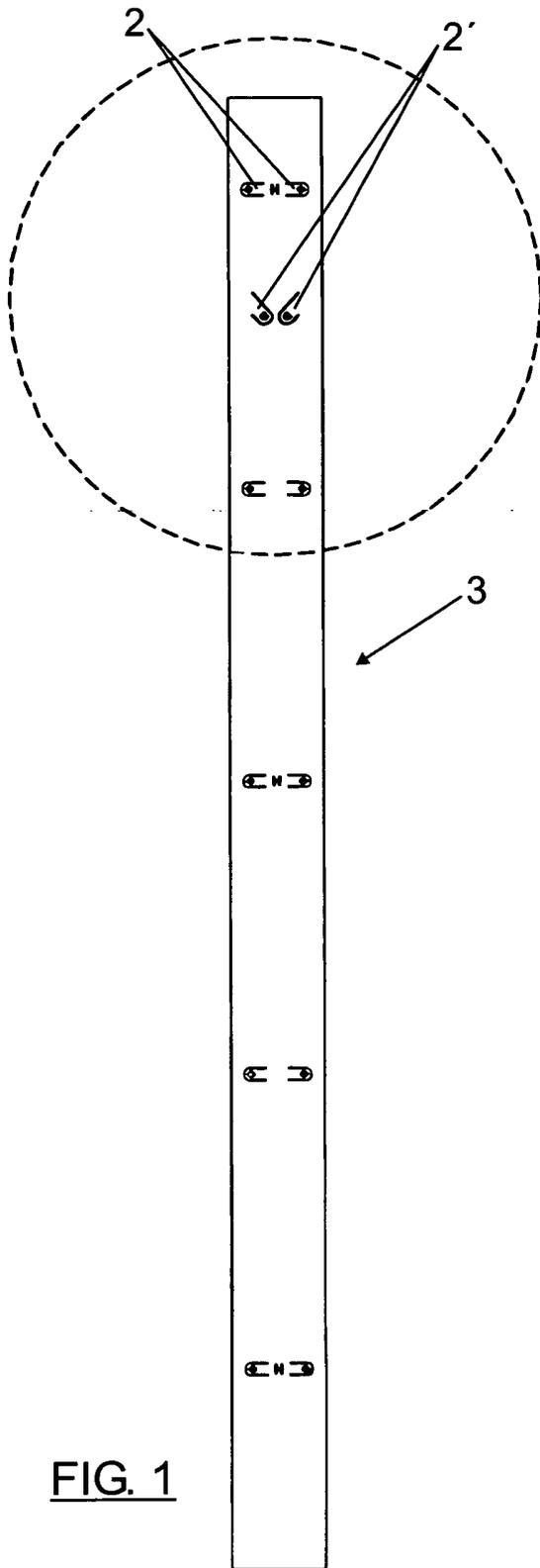


FIG. 1

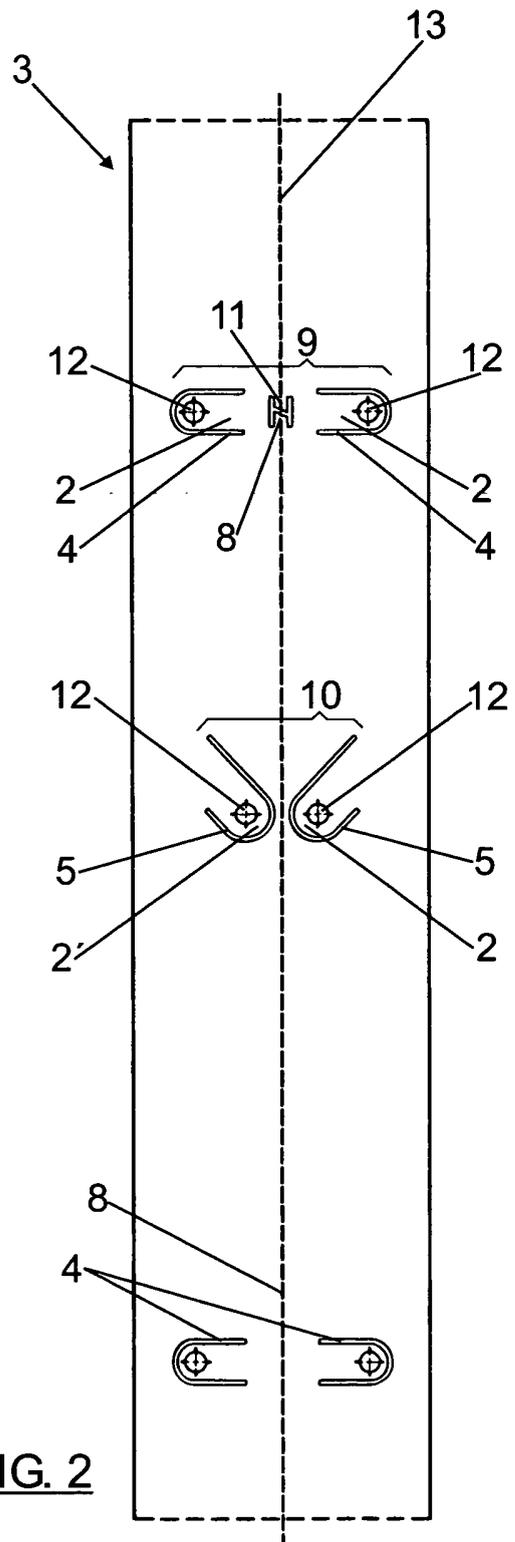
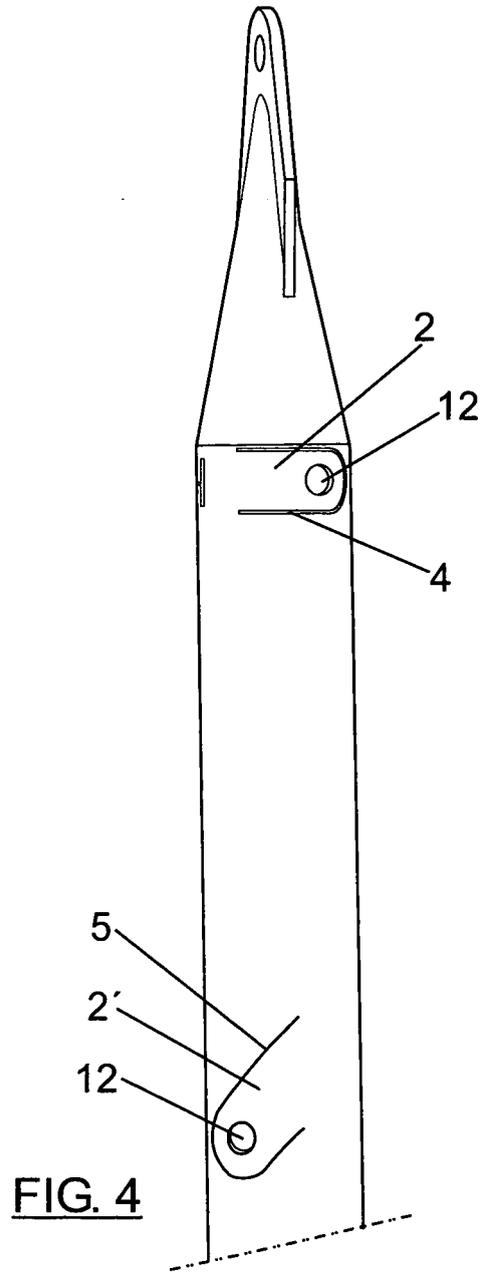
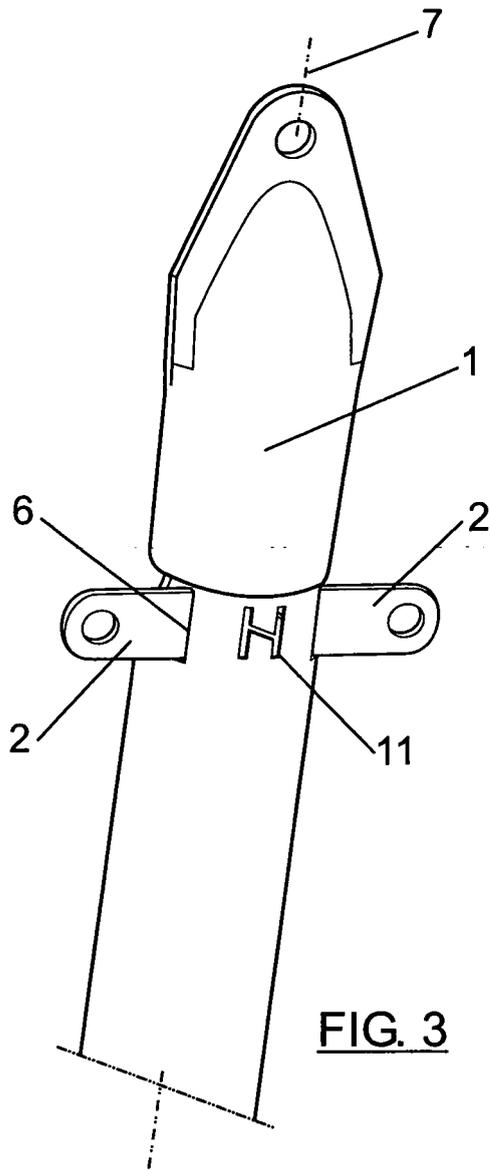


FIG. 2



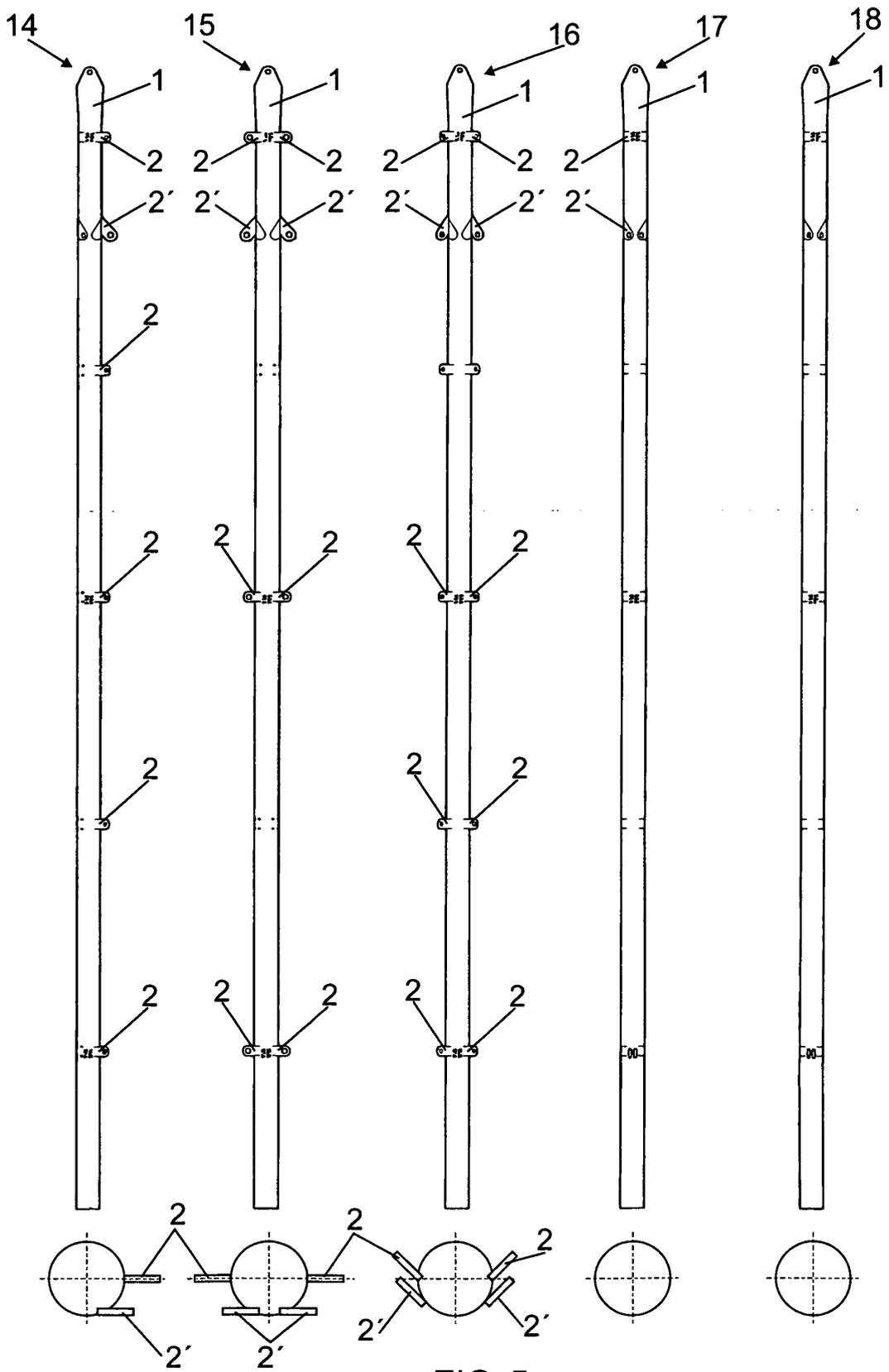


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ES 2007/000111

A. CLASSIFICATION OF SUBJECT MATTER		
see extra sheet		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) E04H		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CIBEPAT,EPODOC		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 6802496 B1 (PRETA et al.) 12.10.2004, column 4, lines 16-23; column 27, lines 19-62; column 30, lines 12-61; figures 1,15-17,19-21.	1-4,8 5
Y	GB 568431 A (BARNETT CLAUDE JOSEPH) 04.04.1945, the whole document.	1-4,8
A	GB 191509843 A (RHINES FRANK KELLEY) 06.07.1916, the whole document.	1-3,8
A	ES 1060246 U (IND FORMUR S L) 01.08.2005, the whole document.	1-3,8
A	DE 19749236 A1 (FLICK ULRICH ; WEINHEIMER DIETER ; LEHN HERIBERT) 20.05.1999, abstract; figures.	1,7
A	US 6779782 B1 (WEBB et al.) 24.08.2004, the whole document.	1
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents:	"I"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance.		
"E" earlier document but published on or after the international filing date		
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family
Date of the actual completion of the international search	Date of mailing of the international search report	
05 July 2007 (05.07.2007)	12/07/2007	
Name and mailing address of the ISA/ O.E.P.M.	Authorized officer	
Paseo de la Castellana, 75 28071 Madrid, España. Facsimile No. 34 91 3495304	S. Fernández de Miguel	
	Telephone No. +34 91 349 5437	

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ES 2007/000111

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 1026897 U (ANTEZA SINTAL SA) 16.06.1994, the whole document.	1

Form PCT/ISA/210 (continuation of second sheet) (April 2007)

**EP 1 992 769 A1**

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No. PCT/ ES 2007/000111
--

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
US 6802496 B	12.10.2004	US 7121530 B	17.10.2006 17.10.2006 17.10.2006
-----	-----	-----	-----
GB568431 1 A	04.04.1945	NONE	-----
-----	-----	-----	-----
GB191509843 3 A	06.07.1916	NONE	-----
-----	-----	-----	-----
ES 1060246 U	01.08.2005	ES 1060246 Y	16.11.2005 16.11.2005 16.11.2005
-----	-----	-----	-----
DE19749236 6 A	20.05.1999	NONE	-----
-----	-----	-----	-----
US6779782 2 B	24.08.2004	NONE	-----
-----	-----	-----	-----
ES 1026897 U	16.06.1994	ES 1026897 Y	16.02.1995 16.02.1995 16.02.1995
-----	-----	-----	-----

Form PCT/ISA/210 (patent family annex) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 2007/000111

CLASSIFICATION OF SUBJECT MATTER

*E04H 17/08* (2006.01)

*E04H 17/10* (2006.01)

*E04H 17/20* (2006.01)