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

(11) EP 1 666 682 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.06.2006 Bulletin 2006/23

(51) Int Cl.:
E04F 11/18 *(2006.01)* ***E04H 12/22*** *(2006.01)*

(21) Application number: **04380250.3**

(22) Date of filing: **03.12.2004**

(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 MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR LV MK YU

(71) Applicant: **Moreda-Riviere Trefilerias, S.A.**
33211 Gijon (Asturias) (ES)

(72) Inventors:
- **Diaz Pastur, M.**
  Moreda Riviere Trefilerias SA
  33211 Gijon (ES)
- **Menendez Novas, F.**
  Moreda Riviere Trefilerias SA
  33211 Gijon (ES)

(74) Representative: **Carpintero Lopez, Francisco**
Herrero & Asociados, S.L.,
Alcalá, 35
28014 Madrid (ES)

(54) Device for fastening posts on a surface, erection kit and fence

(57) Device for fastening posts on a surface which comprises a base (1) and a hollow coupling portion (2), constituted by a plurality of coupling elements (6), which is coupled on the open end of a post (5). The post (5) is fastened to the device by the increasing pressure which a locking element (8) housed in the hollow of the coupling portion (2) applies on the coupling elements (6) when being displaced from a first to a second position, the coupling elements (6) applying an increasing pressure on the post (5), which is left firmly joined to the device. The invention includes an erection kit formed by a fastening device and a post (5) and a fence formed by several erection kits, enclosing elements (14) between each pair of posts (5) and elements (15) for fastening said panels to the posts (5).

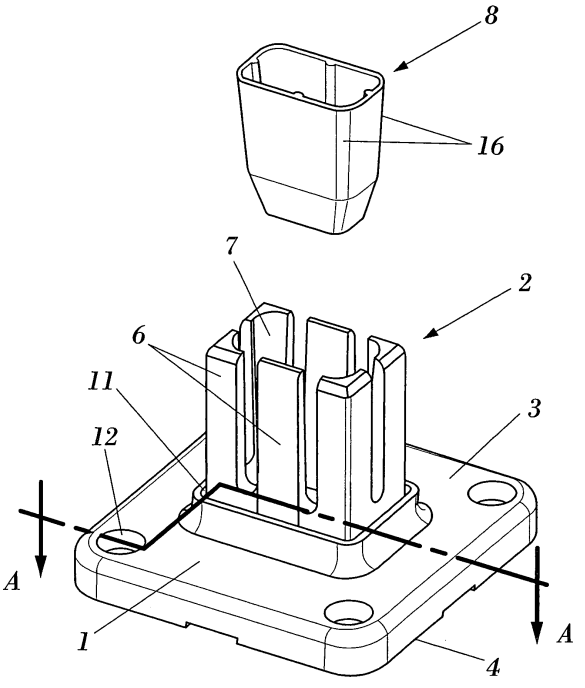

FIG. 1

EP 1 666 682 A1

Description

[0001] OBJECT OF THE INVENTION The present invention relates to a fastening device for vertical posts or the like, for example for barriers or fences installed as protective elements in outdoor spaces.

[0002] The device for fastening posts object of this invention can be installed on walls already built of concrete, stone or similar materials whereon it is desired to incorporate a fence constituted by posts and panels. It can likewise be installed on ceramic plates or tiles, for example, in the installation of fences for building terraces, swimming pools, etc.

BACKGROUND OF THE INVENTION

[0003] The need to delimit outdoor spaces for safety reasons, such as educational centres, landscaped, residential or industrial areas has encouraged the development of fence systems incorporated basically by vertical posts, panels or meshing and clamps.

[0004] These fences, generally metallic, can be installed directly on the ground or on stub walls which constitute the lower part of the fence.

[0005] In the current state of the art diverse devices are known for anchoring the posts constituting the fence to the ground on which it is installed, the purpose of which is to prevent the deterioration of the post as a consequence of the direct sinking thereof in the earth. On occasions the post is fixed in the ground by means of concrete to thereby increase its stability.

[0006] However these anchorages are not adequate in the case in which the posts are to be installed on low walls of stone, concrete or similar materials in which the insertion thereof is much more complicated. On occasions said walls are built without taking into account the later incorporation of a metal fence on their top part, and so the preparation of housings has not been foreseen for embedding the posts. In the event of it being decided to implement these housings after building the wall, there exists the possibility that the latter will split, the cracks expanding through the material constituting the wall and causing its deterioration.

[0007] Another alternative consists of welding a plate on the bottom end of the post with holes through which screws can pass and so hold the post to the wall in which holes have previously been drilled for the plugs and the fastening screws.

[0008] Through document ES 2 187 278 A1 support bases are known for vertical posts constituting fences which in spite of not being specifically developed for their installation on walls, but directly in the ground, could be valid for that application. These bases consist of tubular pieces in the form of an inverted U which are fixed to the ground by screwing. As for the fastening of the post to said bases, there is the possibility that the post be welded directly to the upper part of the inverted U-piece or be inserted in one of the two shells which the base incorporates, in which case, however, the post is not fastened to the base and can be withdrawn from the same, a feature that can signify a drawback.

[0009] Moreover, the convenience is pointed out of avoiding welds in the anchoring devices, not only for the requirement this involves of needing specialist personnel for the installation of the fence but also because the welds can be starting points for breakage and corrosion, especially if they are outdoors. So, in the light of the aforesaid, the objective of the present invention is to develop a device for fastening posts in fences which are installed on low walls or in general on surfaces and which permit the posts to be fastened to a base without requiring welding to be carried out.

DESCRIPTION OF THE INVENTION

[0010] The invention consists of a fastening device for the fastening of posts on a surface; the device comprises a base and a coupling portion joined to the base.

[0011] Said coupling portion extends from a first surface of the base (surface which when the base is fixed to the surface will correspond to the "free", normally upper surface, of said base) and has an external configuration complementary to an internal configuration of an open end of a post to be fastened with the device (end which corresponds to that which usually is located at the bottom when the fastening of the post to said device has been completed), so that said portion can be snugly inserted in said open end of the post.

[0012] The coupling portion also comprises a plurality of coupling elements or appendages, the external surfaces of the coupling elements defining the external configuration of the coupling portion and a space or receptacle delimiting the internal surfaces of the coupling elements.

[0013] The device also comprises a locking element or wedge configured to be at least partly housed in said space delimited by the coupling elements and displaceable between a first position and a second position, said locking element being configured so that on being displaced from said first position toward said second position it applies an increasing outward pressure on the coupling elements (because the external surface of the locking element makes contact at least at some point with the internal surface of the coupling elements) so that, when the coupling portion is snugly inserted in an open end of a post to be fastened, said coupling elements apply an increasing pressure (as the locking element advances from the first position toward the second position) on the internal surface of the open end of said post (impeding in this way the withdrawal of the coupling portion from the interior of the post).

[0014] The fastening device so configured allows posts to be fastened to a surface in a straightforward manner and with hardly any tools, a significant advantage being the fact that it is not necessary to carry out welding and therefore intervention by specialist personnel is not

required for the assembly of the posts on the said device. Advantageously the device has no welds (for example, the device can be manufactured from aluminium by means of injection into a mould), and therefore its possible deterioration is avoided to a great extent, since the welding points are frequently points where oxidation or corrosion processes begin and can also be the origin of subsequent breakage. With said device it is possible, for example, to secure posts to low walls or ceramic plates or tiles in which orifices were not originally foreseen for the insertion of the posts. Making holes to insert the posts as such in a wall already built can be complicated and damage the wall, however, with the invention, it is possible to fit a conventional post with a base which in turn can have several orifices which allow the fastening of the base to the wall by means of screws and plugs or by means of other fastening elements which do not require large holes. Thus, instead of having to make a hole to insert the post as such in the wall, it is sufficient to make some small holes in the wall, for the screws and their corresponding plugs, or for similar fastening mechanisms, by means of which the base will be fastened to the wall.

[0015] In the event that the posts to be fastened are to be installed in a direction substantially perpendicular to the surface, the coupling portion of the device will be extended in a direction substantially perpendicular to the base (which is usually planar and rests on the surface). There is the possibility, however, that the posts be arranged in a direction different to the foregoing, forming a determined angle with the ground (for example, at the corners of the fences, by way of reinforcement), it being desirable in this case that the coupling portion extend in the same direction as the post inside of which it is housed.

[0016] As has been mentioned above, the coupling portion comprises a number of coupling elements. These can extend in a direction substantially perpendicular to the base, that is, they can be straight elements without bends which make their manufacture more difficult and are points of potential breakage. However they can adopt, when it is considered to be the most appropriate solution, other configurations such as curved arcs or any other. These coupling elements or appendages which extend from the base, can have an elongated configuration in the direction in which they extend, like fingers, so that a contact surface is achieved between the locking element (inserted into the space defined by the internal surfaces of the coupling elements) and each of these elements the largest possible, said elements thereby applying a pressure on the internal surface of the post such that the dismantling thereof is impeded when the locking element is located in the second position of the space defined by the internal surfaces of the coupling elements.

[0017] The locking element or wedge, which as stated above is displaced between a first position and a second position of the space defined by the coupling elements, can be displaced in a direction substantially perpendicular to the base, for example when, having the coupling elements positioned in this same direction, their internal surfaces delimit a space or hollow which also extends in a direction perpendicular to the base. This possible configuration can be the most appropriate when the post that is being fastened to the device extends vertically. However, if it is desired to fasten a post at an angle with respect to the plane of the surface, the preferred configuration will be that in which both the coupling elements and the space defined by the internal surfaces thereof extend in the same direction as the post, the locking element then being displaced in this direction.

[0018] To simplify the assembly of the post in the device a possible configuration of the locking element has been considered in which the latter comprises at least one threaded or drilled portion (usually located on the part that is most deeply inserted into the space in which it is housed). In said at least one threaded portion a corresponding threaded element or screw is introduced which traverses the base from a second surface thereof (usually that which is facing the surface on which the device is installed), so that on turning said threaded element a displacement of said locking element takes place, which advances in this way from a first position of the hole to a second position and therefore increases the pressure which it applies on the coupling elements, positioning them "outwards" so that they apply a greater force on the internal surface of the post.

[0019] In the area where the coupling portion is joined to the base, the first surface (or upper surface) of the base can comprise a peripheral channel dimensionally in accordance with the external configuration of the open end of the post (that is, the channel has the same shape as the cross-section of the post), so that said open end of the post can be inserted into said peripheral channel, preventing the area where the post rests on the upper surface of the base from being left without any type of protection. Thus, the contact between the post and the upper surface of the base is better protected from rain and other environmental agents which could accelerate the deterioration of the materials constituting both elements. In addition, with a channel which is adapted to the dimensions of the post, the union between post and fastening device can be firmer.

[0020] To secure the base on the surface on which it is installed (directly on the ground or on a walls of stone, concrete or similar materials), said base can be comprise at least two through-holes or orifices through which the corresponding fastening elements or screws can be inserted so that they pass through the base, thereby fastening it to the surface. In this way the tasks of fastening to the supporting surface are simplified since it is only necessary to make some holes therein and insert the corresponding plugs which, in collaboration with the fastening elements, assure the base is correctly joined to the surface, without it being necessary to make holes in which the posts are embedded. For example the base can have four holes for fastening it to the surface with four screws or the like. The screws can be made of stain-

less steel and have one end prepared to receive the end of an Allen key.

[0021] As for the constitution of the locking element, this can have the form of a wedge, that is, have at least one portion which is a truncated cone or a truncated pyramid. Usually, the locking element will have a portion with a truncated conical shape when the open end of the post to be fastened has a circular internal configuration, a configuration therefore complementary to the external configuration of the coupling portion. However, in the event that the open end of the post has an internal configuration of polygonal cross-section, the locking element can have at least one portion with a truncated pyramidal shape having a cross-section complementary to the previous one. To facilitate the displacement of the locking element between the first position and the second position of the space delimited by the coupling elements, in which space it is at least partly housed, the latter can be located with the narrowest part in the truncated conical or truncated pyramidal portion nearest the base and with a wider part of said portion farther from the base.

[0022] The first position from which the locking element is displaced toward the second position can be farther from the base than said second position, so that this displacement gives rise to an approximation of said locking element toward the base of the device and therefore toward the surface on which said device is fastened.

[0023] The coupling portion of the device can comprise at least four coupling elements located in correspondence with four edges of the locking element, each of the different coupling elements having a cross-section which has a concave or angled portion in which said locking element is guided, thereby achieving that there be at least one point of contact between the internal surface of each coupling element and the external surface of the locking element, so that the displacement of said locking element gives rise to an increasing outward pressure on each of the coupling elements. The number of these coupling elements comprised in the coupling portion can vary, six elements being considered to represent an appropriate number for a possible embodiment (the number of contact points between the locking element and the coupling portion can therefore be increased). Logically, the size, the shape and the number of the appendages or coupling elements can be chosen with relative freedom, depending on what results most practical taking into account, for each specific application, the form and dimensions of the interior part of the open end of the post to be fastened, the material employed (for example, aluminium) for the fastening device, and the fact that the coupling elements should tilt outward under the pressure applied with the locking element, to thereby apply the corresponding pressure on the interior surface of the open end of the post.

[0024] The object of the invention is not limited exclusively to the fastening device, but also includes the kit for erection of posts on a surface. Said erection kit comprises a fastening device as described above and a post with an open end which has an internal configuration complementary to the external configuration of the coupling portion of the base of the device, so that said coupling portion can be snugly inserted in said open end of the post. The post can have any configuration, for example, a circular or square section, in a double Tee form, etc., provided it has an area which allows the adequate insertion of the coupling portion.

[0025] The invention extends to a fence of those installed as protective elements which delimit outdoor spaces, said fence comprising at least two erection kits of those aforementioned, at least one enclosing element or panel which runs between at least one pair of posts and fastening elements or clamps configured to fasten said enclosing element to each of the posts of said pair of posts. The enclosing elements or panels are run between each pair of posts and they can be panels of any type, constituted both by continuous surfaces, thereby giving rise to a closed fence, or panels formed by metallic meshes or made of any other material.

[0026] The fastening device can be manufactured in metal, for example, in aluminium or in another ductile material which allows the coupling elements or appendages to be deformed or deflected easily under the pressure applied by the locking element, for the purpose of coming into contact with and applying pressure on the interior part of the end of the post, which pressure will increase in response to the displacement of the locking element from the first position toward the second position. Aluminium or aluminium alloys can be suitable materials, since usually they are not only ductile but also offer good resistance to corrosion and are easy to handle. The locking element, the base and the coupling elements can be coated with a protective material, for example, a conventional polyester, epoxy or epoxy-polyester paint.

DESCRIPTION OF THE DRAWINGS

[0027] To supplement the description that is being made and with the object of assisting in a better understanding of the characteristics of the invention, in accordance with a preferred practical embodiment of the same, a set of drawings accompany this description as an integral part thereof wherein by way of illustration and not restrictively, the following has been represented:

Figure 1. - It shows an exploded view in perspective of a fastening device in accordance with a preferred embodiment of the invention.

Figure 2. - It shows an irregular section on the plane A-A shown in the preceding figure of a fastening device fixed to a surface and with an post erected, the locking element being in the first position.

Figure 3. - It shows an irregular section on the plane A-A shown in figure 1 of a fastening device fixed to a surface and with a post erected, the locking ele-

ment being in the second position.

Figure 4. - It shows a view in perspective of a fence comprising several assembly kits, several enclosing elements and fastening elements.

PREFERRED EMBODIMENT OF THE INVENTION

[0028] In the light of the figures an example of embodiment of the invention can be observed therein, which consists of a fastening device for fastening posts (5) on a surface. The invention also extends to the erection kit which, comprising a fastening device is completed with a post (5) which is assembled thereto, as well as to the fence which, comprising several erection kits is completed with enclosing elements (14) and fastening elements (15).

[0029] Figure 1 shows a view in perspective of a fastening device according to a preferred embodiment, in which the base (1) is a quadrangular fishplate with rounded corners and the coupling portion (2) is joined to the first surface (3), in this case the upper surface, of said base (1) in its central part. The coupling portion (2) can be formed, for example, in a single mould together with the base (1) to form a monobloc body, for example in aluminium or in another material with appropriate ductility. The base (1) in this case comprises four through-holes (12), each of them located in the area near to each of the four corners of the base (1) and their purpose, as will be seen later, is to allow the fastening of the base (1) on a surface. It also has other two orifices or through-holes (17) (shown in figures 2 and 3), located in the central area of the base, which from the second surface (4) of the base run through it until reaching the first surface (3) in the interior area of the coupling portion (2).

[0030] The coupling portion (2) in this specific embodiment extends perpendicularly to the base (1) and comprises six elongated coupling elements (6) which extend in the same direction, said coupling elements (6) being arranged in such a way that the coupling portion (2) has a rectangular external configuration. In the area where the base (1) joins the coupling portion (2) the first surface (3) of the base (1) has a peripheral channel (11), rectangular in form with slightly rounded corners.

[0031] Of the six coupling elements (6) which comprise the coupling portion in this case (2), four of them are configured in such a way that their cross-section has an angled portion on its external surface whilst on its internal surface it has a concave portion in correspondence with the four rounded edges (16) of the locking element (8). The other two coupling elements (6), of rectangular section, are located facing each other, so that the internal surfaces of the six coupling elements (6) define a rectangular space (7) with rounded corners.

[0032] The device also comprises a partly hollow locking element (8) with rounded edges (16) such as is shown in figure 1, configured to be housed at least partly in said space (7), for which reason its section is rectangular with rounded corners. The locking element (8) has the general configuration of a truncated pyramid with inverted vertex and rounded arrises and has a lower end in which the truncated pyramid feature is more pronounced. Said lower end is solid and has two threaded portions (9) whereon, as will be seen later, the corresponding threaded elements (10) are inserted the turning of which produces the displacement of the locking element (8) through the interior of the space (7) defined by the coupling elements (6) from an upper first position (represented in figure 2) to a second position (shown in figure 3) nearer to the base (1).

[0033] Figures 2 and 3 show two views in irregular section in which the fastening of the base (1) to the surface is appreciated and the erection of a post (5) on the device. In the sequence for fastening the post (5) the device has been represented in two different figures: figure 2 corresponds to the first position of the locking element (8), whilst figure 3 corresponds to the final state of the erection in which the locking element (8) has been displaced through the interior of the space defined by the coupling elements to the second position.

[0034] The fastening of the base (1) to the surface on which it is desired to install the device is carried out by introducing a fastening element (13) in each of the through-holes (12) located in the vicinity of the corners of the base (1). These fastening elements (13) run through the base (1) from its first surface (3) to the second surface (4), which is that which confronts the ground when the base (1) has been fastened, and are inserted in the plugs (18) which have been arranged for this purpose in the corresponding orifices made in the surface on which the base (1) is fastened.

[0035] As shown in figure 2, the coupling portion (2) is snugly inserted in the open end of the post (5), which in this case has a rectangular external configuration. The lower part of the open end of the post (5) is introduced in the peripheral channel (11) which the first surface (3) of the base has for this purpose in the area of union with the coupling portion (2). In the first position of the locking element (8), shown in this figure 2, the coupling elements (6) constituting the coupling portion (2) do not apply any pressure on the internal surface of the post (5), for which reason the latter could be easily separated from the device.

[0036] To secure the fastening of the post (5) to the device the locking element (8) is made to advance to a second position, reaching a state represented in figure 3. To displace the locking element (8) from the first position toward the second position, nearer to the base (1), two threaded elements (10) are turned which, traversing the base (1) through the through-holes (17) are threaded onto the two threaded portions (9) of the lower part of the locking element (8), causing the same to be displaced perpendicularly to the base (1), coming closer thereto. This forward motion of the locking element (8) through the interior of the space (7) defined by the internal surfaces of the coupling elements (6) causes an increasing

outward pressure from said elements, so that these in turn apply an increasing pressure on the internal surface of the open end of the post (5), which in this way is firmly joined to the device.

[0037] In figure 4 a fence has been represented constituted by several erection kits, each of them comprising a fastening device and a post (5), between which enclosing elements (14) have been installed, in this case a mesh of metallic material. The fastening of the enclosing elements (14) to each of the posts (5) between which they run, is implemented by means of fastening elements (15) located on the upper and lower part of the post (5), said fastening elements (15) in this specific embodiment being clamps which are installed around the post (5) and also surround one of the vertical wires constituting the mesh, which in this way is joined to the posts (5) between which it is installed.

Claims

1. Device for fastening posts on a surface, which comprises:

a base (1); and
a coupling portion (2) joined to the base (1);

characterised in that

said coupling portion (2) extends from a first surface (3) of the base (1) and has an external configuration complementary to an internal configuration of an open end of a post (5) to be fastened with the device, so that said coupling portion (2) can be inserted snugly in said open end of the post;
said coupling portion (2) comprising a plurality of coupling elements (6), the external surfaces of the coupling elements (6) defining the external configuration of the coupling portion (2) and the internal surfaces of the coupling elements (6) delimiting a space (7);
the device also comprising a locking element (8) configured to be at least partly housed in said space (7) delimited by the coupling elements (6) and displaceable between a first position and a second position, said locking element (8) being configured so that on being displaced from said first position towards said second position it applies an increasing outward pressure on the coupling elements (6) so that, when the coupling portion (2) is introduced snugly in an open end of a post (5) to be fastened, said coupling elements (6) apply an increasing pressure on the internal surface of the open end of said post (5).

2. Device according to the previous claim, in which the coupling portion (2) extends in a direction substantially perpendicular to the base (1).

3. Device according to any one of the previous claims, in which each coupling element (6) of said coupling portion (2) extends in a direction substantially perpendicular to the base (1).

4. Device according to any one of the previous claims, in which each coupling element (6) has an elongated configuration in a direction in which the coupling element (6) extends from the base (1).

5. Device according to any one of the previous claims, in which the locking element (8) housed in said space (7) is displaced in a direction substantially perpendicular to the base (1).

6. Device according to any one of the previous claims in which the locking element (8) comprises at least one threaded portion (9) on which is introduced a corresponding threaded element (10) which traverses the base (1) from a second surface (4) of the base (1), so that on rotating said threaded element (10) a displacement of said locking element (8) takes place.

7. Device according to any one of the previous claims in which in the area where the base (1) joins the coupling portion (2) the first surface (3) of the base (1) comprises a peripheral channel (11) dimensionally in accordance with the external configuration of the open end of the post (5), so that said open end of the post (5) can be inserted into said peripheral channel (11).

8. Device according to any one of the previous claims, in which the base (1) comprises at least two holes (12) through which corresponding fastening elements (13) can be introduced so that they traverse the base (1) to fasten said base (1) on a surface.

9. Device according to any one of the previous claims, in which the locking element (8) has at least one truncated pyramidal or truncated conical portion.

10. Device according to claim 9, in which the locking element (8) is located with a narrower part of the truncated pyramidal or truncated conical portion nearer the base (1) and with a wider part of said truncated pyramidal portion farther from the base.

11. Device according to any one of the previous claims, in which said second position is closer to the base (1) than said first position.

12. Device according to any one of the previous claims, in which the coupling portion (2) comprises at least four coupling elements (6) located in correspondence with four edges (16) of the locking element (8),

each of the different coupling elements (6) having a cross-section which has a concave or angled portion in which said locking element (8) is guided.

13. Device according to any one of the previous claims, in which the coupling portion (2) comprises a total of six coupling elements (6).

14. Kit for erection of posts on a surface, which comprises:

a device according to any one of the previous claims; and
a post (5) with an open end which has an internal configuration complementary to the external configuration of the coupling portion (2) of the base (1) of the device, so that said coupling portion (2) can be inserted snugly into said open end of the post (5).

15. Fence which comprises:

at least two erection kits according to claim 14;
at least one enclosing element (14) which extends between at least one pair of posts (5); and
fastening elements (15) configured to secure said enclosing element (14) to each of the posts (5) of said pair of posts (5).

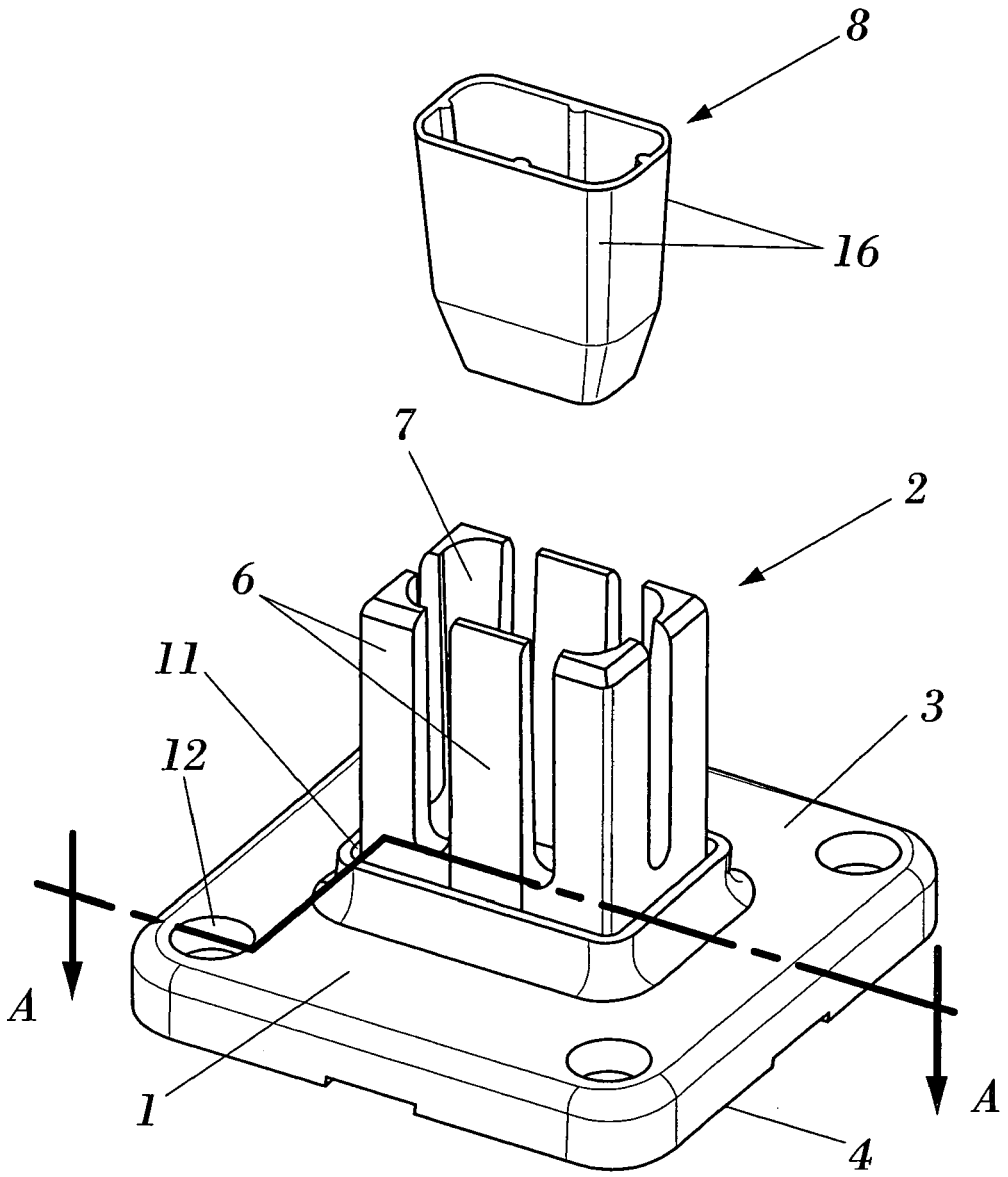

FIG. 1

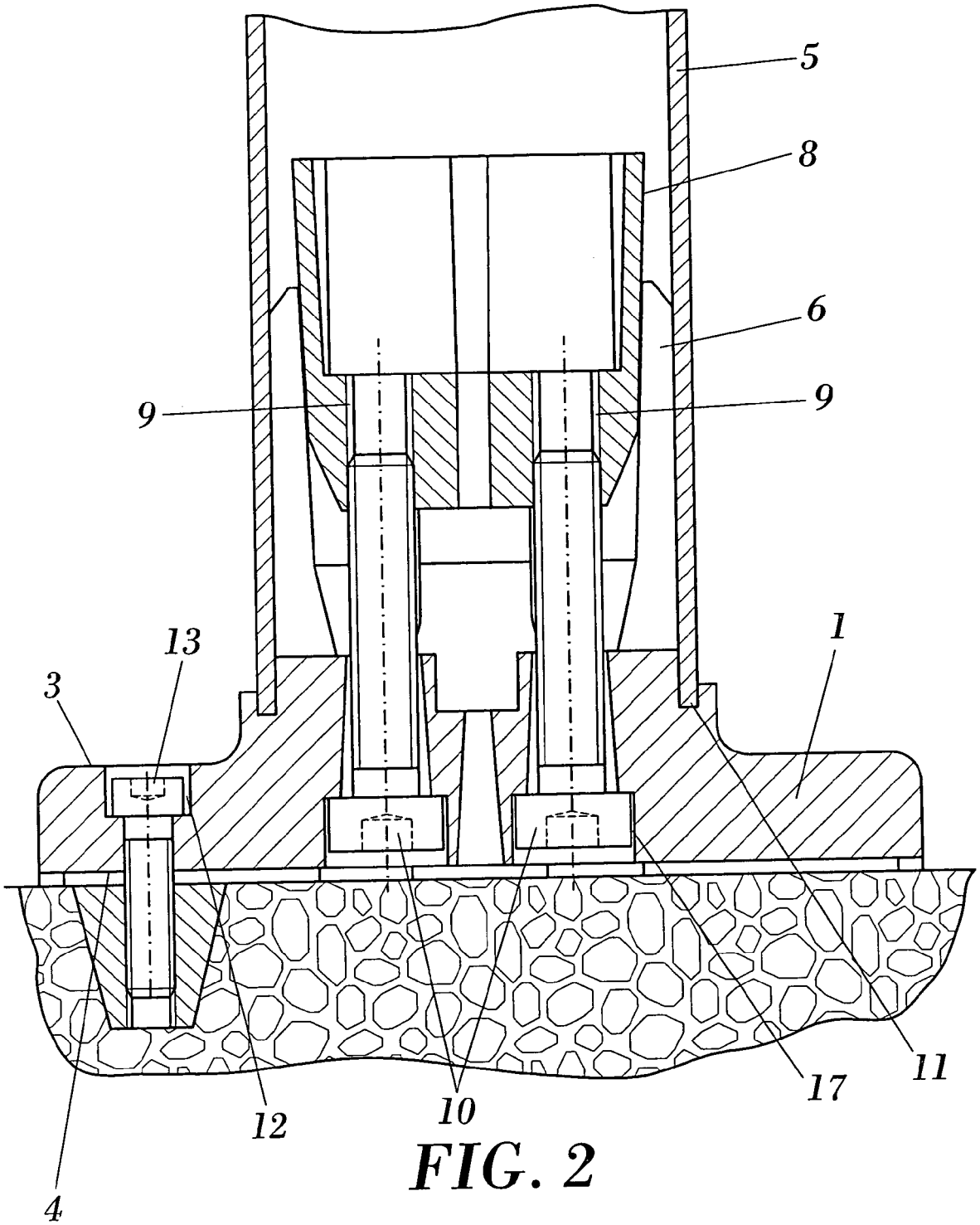

FIG. 2

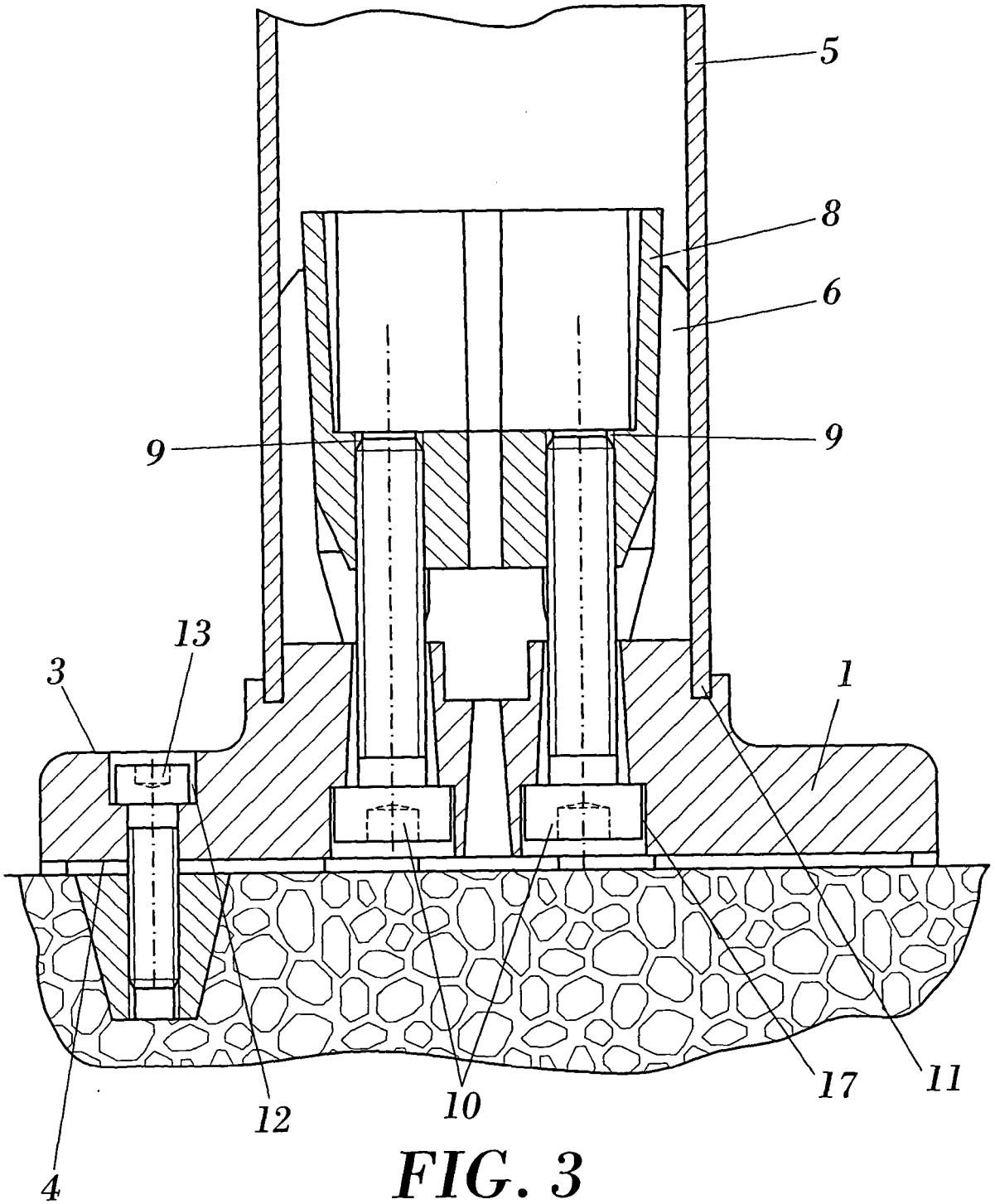

FIG. 3

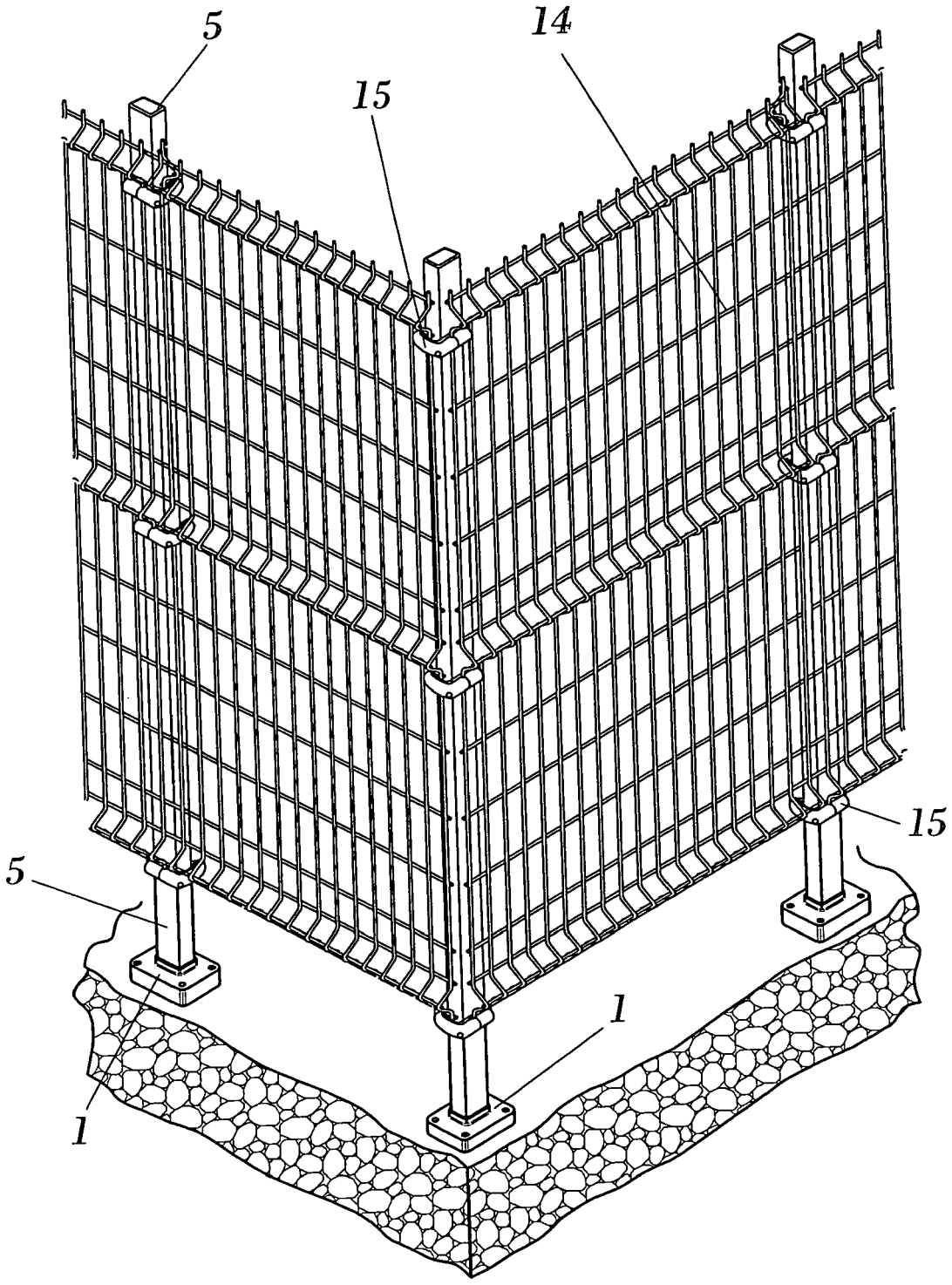

FIG. 4

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 38 0250

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)
X	WO 91/13222 A (CLEARVIEW ALUMINIUM WINDOWS PTY. LTD) 5 September 1991 (1991-09-05) * page 1, line 1 - line 4 * * page 5, line 23 - page 8, line 10; figures 1,2 *	1-15	E04F11/18 E04H12/22
X	US 3 414 236 A (SIEGAL BURTON L) 3 December 1968 (1968-12-03) * column 4, line 46 - column 5, line 9; figures 10-12 *	1-5, 9-12,14, 15	
X	FR 2 389 730 A (FRANK GMBH WILH) 1 December 1978 (1978-12-01) * figures *	1-15	
A	FR 2 303 918 A (TRANSFORMATION PLASTIQUES INDLE) 8 October 1976 (1976-10-08) * page 3, line 8 - line 11; figure 9 *	7	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E04F
E04H
F16B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 April 2005	Severens, G

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 04 38 0250

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.

28-04-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9113222 A	05-09-1991	AU 635113 B2	11-03-1993
		AU 7124491 A	29-08-1991
		WO 9113222 A1	05-09-1991
		JP 5506486 T	22-09-1993
		NZ 237190 A	23-12-1992
US 3414236 A	03-12-1968	NONE	
FR 2389730 A	01-12-1978	DE 7714073 U1	15-09-1977
		FR 2389730 A1	01-12-1978
FR 2303918 A	08-10-1976	BE 826512 A1	30-06-1975
		FR 2303918 A1	08-10-1976

EPO FORM P0459

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