

FENCE

The invention relates to a fence, comprising

- 5 - at least one fence post having a core and at least two front flanges extending from said core;
- at least one fence panel containing horizontal and vertical wires;
- at least one clamp, which is fixed to a flank of the core of the post and which, in a holding position, is holding at least one vertical edge wire of said fence panel (behind a front flange of the post).

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In order to obtain a fence, fence panels are often attached to fence posts having a core and at least two front flanges by fixing a clamp to the post, which is in a holding position holding at least one vertical edge wire of the fence panel. Mostly, this is done in such a way that the junction between the attachment means and the vertical
15 edge wire of the fence panel is shielded by the front flange, making its unauthorised removal rather difficult. With such fences, it remains however possible to intrude the fence by removing the clamp, using tools.

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In fences with fence posts having a core and at least two front flanges extending from said core, where a clamp is used to fix at least one wire mesh panel to said post, said clamp is often fixed to the post by means of clicking. Such fence is e.g. described in WO 2001/022887. In order to firmly attach a wire mesh panel which cannot easily be detached by intruders, such attachment by clicking a clamp to the post requires a firm clicking force. As at clicking, one also has to handle the panel, it is not easy to attach
25 a panel to a post by means of firmly clicking the clamp to the post. Where the clicking force is reduced in order to simplify attachment of the panel to the post, it becomes also easier to intrude a fence which is herewith erected.

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Therefore, as described in FR 2 824 348, a fence has been developed with a clamp which is fixed to a projection of a flank of the core of the post. Mounting of such a fence is however cumbersome with this clamp, as it needs first a careful placement

with respect to the projection of the flank and thereafter fixation with an element which is either easily lost, either, when being fixed to the clamp, forms an obstacle for the careful placement with respect to the projection of the flank. It is moreover still possible to intrude such a fence by detaching the clamp by acting on it with tools.

It is therefore an object of the invention to provide a fence which is easier to mount and can less easily be intruded than the fences of the state of the art.

- 10 The object of the present invention is achieved by providing a fence, comprising
- at least one fence post having a core and at least two front flanges extending from said core;
 - at least one fence panel containing horizontal and vertical wires;
 - at least one clamp, which is fixed to a flank of the core of the post and which,
- 15 in a holding position, is holding at least one vertical edge wire of said fence panel (behind a front flange of the post);

wherein the clamp is fixed to said flank by attachment means such that it is movable from said holding position to a non-holding position, and vice versa, only in a direction towards the flank or away from it and that in the holding position it is exercising a clamping force in said direction.

A clamp which only needs to be moved in a direction towards the flank before being fixed by attachment means in order to fix the clamp to the post can more easily be mounted than a clamp as described in FR 2 824 348.

25 Moreover, such a clamp can less easily be removed using tools, as a clamping force is acting in a direction at an angle with respect to the direction along the flank in which an intruder will act on the clamp with tools in order to try removing the clamp. It is therefore less easy to intrude this fence.

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The attachment means of such a fence according to the invention preferably comprise at least one selfbreaking nut.

As the clamp is fixed behind a front flange of the post, the junction between the attachment means and the vertical edge wire of the fence panel is shielded by the front flange, making it rather difficult to reach the attachment means of such a fence. However, as intruders are rather inventive in finding aids by means of which they are able to reach the attachment means, it is preferable that these attachment means cannot easily be handled with common tools. A selfbreaking nut is a good example of attachment means which after attachment and breaking off of the head of the nut, cannot be handled with common tools any more.

In a preferred embodiment of a fence according to the invention, the clamp is also holding at least one horizontal wire of the fence panel to the post in the mounted position of the fence, such that the position of the panel relative to the post is secured in the vertical direction.

In a more preferred embodiment of a fence according to the invention, the clamp is holding several horizontal wires of the fence panel to the post in the mounted position of the fence.

By holding a vertical end wire and several horizontal wires of the fence panel, a very strong fixation of the fence panel with this clamp to the post can be obtained.

In an even more preferred embodiment of a fence according to the invention the distance between adjacent horizontal wires of the fence panel is 2 to 10 times smaller than the distance between adjacent vertical wires. More preferably, the distance between adjacent horizontal wires is then about 13 mm.

When such an intermediate distance is maintained, an individual is normally not able to slide his fingers and/or toes between the horizontal wires, thus making it very

difficult to climb such a fence panel. In addition, it is also difficult to slide, for example, a pair of wire cutters between the horizontal wires, which makes it difficult to cut these wires.

- 5 When a clamp is moreover shielded by this fence panel, such an intermediate distance makes it difficult to reach this clamp, with or without tools.

The wires of a fence panel of a fence according to this invention are preferably welded to one another. As a result of the fact that the various wires are welded to one
10 another at the locations where they cross each other, a fence panel of this type is relatively difficult to penetrate. The wires are also preferably made from galvanized steel.

In a specific embodiment of a fence according to the invention the clamp comprises a
15 plate and several legs extending substantially perpendicularly from and at one side of said plate, together forming recesses for taking up horizontal and/or vertical wires for holding them to the post.

Such a clamp can be made by folding it, out of a metal plate, wherein the necessary
20 openings are provided.

In a more specific embodiment of a fence according to the invention, said plate is substantially rectangular and the legs extend from at least two opposite sides of the rectangular form. The legs then preferably extend from each side of the rectangular
25 form, to obtain a clamp with which a fence panel can be firmly attached to a post of this fence.

Such a plate is then even more preferably provided with at least three legs at each of two opposite sides of the rectangular form, forming at least two recesses for taking
30 up at least two horizontal wires for fixing them to the post.

The plate is furthermore preferably provided with at least one hole for taking up at least one attachment means, such as a screw, for fixing the clamp to the post.

5 In a further specific embodiment of a fence according to the invention, the fence panel comprises at least one U- or V-shaped beam extending horizontally along the fence panel and the clamp is fixed in the U- or V-shape of the beam in its holding position.

10 The core of a post of a fence according to this invention is preferably hollow. Even more preferably such a post is completely hollow. In this way a firm post can be obtained using little material, e.g. by folding the post out of a metal plate or by rolling out of metal or by extrusion of plastic.

15 In a specific embodiment of a fence according to the invention, the post has a substantially I-shaped cross section, thus having two front flanges extending from the core and two back flanges extending from the core, shielding the clamp from the front side of the fence respectively from the back side of the fence.

20 The core of the post of a fence according to this invention is furthermore preferably provided with one or more holes for receiving attachment means, such as screws, for fixing the clamp to the post.

25 The present invention is now described in more detail with reference to the following detailed description of preferred embodiment of a fence according to the present invention. The purpose of this description is only to provide illustrative examples and to indicate further advantages and particulars of this embodiment of a fence according to this invention, and can therefore by no means be interpreted as a limitation of the area of application of the invention or of the patent rights which are requested in the claims.

In this detailed description, reference numerals are used to refer to the attached drawings, in which in

- **Fig. 1** a post, a clamp and attachment means of a fence according to this invention are illustrated in perspective in an exploded view;
- 5 - **Fig. 2** the clamp of figure 1 is illustrated in a perspective view;
- **Fig. 3** a first embodiment of a fence according to this invention is illustrated in a perspective view;
- **Fig. 4** the embodiment of figure 3 is illustrated in a top view;
- **Fig. 5** a second embodiment of a fence according to this invention is
10 illustrated in perspective view;
- **Fig. 6** the embodiment of figure 5 is illustrated in a top view;
- **Fig. 7** a third embodiment of a fence according to this invention is illustrated in perspective view.

15 The embodiments of a fence (1) according to this invention as illustrated in figures 3 to 7 comprise a fence post (2) with a substantially I-shaped cross section, thus having a core (2a), two front flanges (2b) extending from said core (2a) and two back flanges (2c) extending from said core (2a). The illustrated posts (2) are entirely hollow and, as illustrated in figure 1, are provided with several holes (2d) in the core
20 (2a), for receiving attachment means (5). Several clamps (4) can thus be attached to one post (2).

Such a post (2) may be made of aluminum alloy, steel, or an appropriate plastics material, or any other appropriate material, and may be extruded or rolled, or made
25 by folding, or by welding etc. to create the required cross-sectional shape. This post (2) is preferably made of galvanized steel.

These embodiments of a fence (1) according to this invention further comprise a fence panel (3) containing horizontal (3a) and vertical wires (3b). The wires (3a, 3b)
30 of such a fence panel (3) are preferably made of galvanized steel and are welded at

each other at the positions where the horizontal wires (3a) cross the vertical wires (3b).

The illustrated embodiments of a fence (1) according to this invention also comprise
5 a clamp (4). In figures 3 to 7, this clamp (4) is fixed to a flank of the core (2a) of the post (2). In the illustrated holding position, the clamp (4) is holding at least a vertical edge wire (3d) of the fence panel (3). In the embodiments of figure 5 to 7, the clamp (4) is also holding two horizontal wires (3a). In all embodiments, the clamp (4) is fixed to the flank by attachment means (5), such that it is movable from the
10 illustrated holding position to a non-holding position, and vice versa, only in a direction towards the flank, or away from it. With these attachment means (5) the clamp (4) is fixed to the post (2) and is exercising a clamping force in the said direction.

15 The clamp (4) may be made of aluminum alloy, steel, or an appropriate plastics material, or any other appropriate material, and may be made by casting, or made by folding, or by welding etc. to obtain the required form.

As illustrated in figure 1, these attachment means can e.g. comprise a bolt (5a) and a
20 selfbreaking nut (5b).

In figure 1 and 2, this clamp (4) is also illustrated separate from the fence (1). The illustrated clamp (4) comprises a plate (4a) with a substantially rectangular shape, and several legs (4b) extending from each side of the rectangular form. At each of
25 two opposite sides of the rectangular form, three legs (4b) are provided, forming at least two recesses (4c) for taking up at least two horizontal wires (3a) for fixing them to the post (2). At the four corners, between the legs (4b) of adjacent sides of the rectangular form, recesses (4e) are formed, for taking up the vertical edge wire (3d) of the fence panel (3). The clamp (4) is furthermore provided with a longitudinal hole
30 (4d) for taking up at least one attachment means (5), for fixing the clamp (4) to the post (2). Thanks to the longitudinal hole (4d) and the equidistant recesses (4c)

between the legs (4b) of the clamp (4), it is possible to allow some adjustment of the positioning of the fence panel (3) in a vertical direction with respect to the post (2).

As illustrated by means of the different embodiments according to this invention,
5 with such a clamp (4), different types of fence panels (3) can be fixed to a fence post (2) as illustrated, with one and the same clamp (4).

In figure 3 and 4, a mesh panel (3) in which horizontal wires (3a) are not equidistant and in which the distance between adjacent vertical wires (3b) can be much smaller
10 than the distance between adjacent horizontal wires (3a) is held to the post (2) with this clamp (4). This fence panel (3) comprises a V-shaped beam (3e) extending horizontally along the fence panel (3). This V-shaped beam (3e) has a width corresponding with the distance between the front flanges (2b) and the back flanges (2c) of the post (2).

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In figures 5 and 6, a mesh panel (3) in which as well horizontal wires (3a) as vertical wires (3b) are equidistant and in which the distance between adjacent horizontal wires (3a) is much smaller than the distance between adjacent vertical wires (3b) is held to the post (2) with this clamp (4). The distance between adjacent horizontal
20 wires (3a) of this fence panel (3) is about 13 mm, in order to prevent fingers or toes or tools from entering between these wires (3a).

In figure 7, a mesh panel (3) in which as well horizontal wires (3a) as vertical wires (3b) are equidistant and in which the distance between adjacent horizontal wires (3a) is much smaller than the distance between adjacent vertical wires (3b) is held to the
25 post (2) with this clamp (4). The distance between adjacent horizontal wires (3a) of this fence panel (3) is about 13 mm, in order to prevent fingers or toes or tools from entering between these wires (3a). This fence panel (3) is further provided with a U-shaped beam (3e) extending horizontally along the fence panel (3). This U-shaped
30 beam (3e) has a width corresponding with the distance between the front flanges (2b)

and the back flanges (2c) of the post (2). In the mounted position of the fence (1), the clamp (4) is fixed in the U-shape of the beam (3e).

5 In order to prevent intrusion of a fence (1), a fence panel (3) is further preferably secured to a post (2) in all directions. Here, this is done by securing the fence panel (3) as well in a horizontal direction as in a vertical direction.

10 In all embodiments, the vertical edge wire (3b) is held in such a way to the post (2) by the clamp (4), that the fence panel (3) is secured relative to the post (2) in a horizontal direction.

15 In the embodiments of figures 5 to 7, the horizontal wires (3a) are held in such a way to the post (2) by the clamp (4), that the fence panel (3) is secured relative to the post (2) in a vertical direction.

20 In the embodiment of figure 3, the illustrated clamp (4) is fixed below and against a first horizontal wire (3a). In order to secure the fence panel (3) relative to the post (2) in a vertical direction, a second clamp (4) can be fixed to the post (2), above and against a second horizontal wire (3a) of the fence panel (3).

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1. Fence (1), comprising
- 5 - at least one fence post (2) having a core (2a) and at least two front flanges (2b) extending from said core (2a);
- at least one fence panel (3) containing horizontal (3a) and vertical wires (3b);
- 10 - at least one clamp (4), which is fixed to a flank of the core (2a) of the post (2) and which, in a holding position, is holding at least one vertical edge wire (3d) of said fence panel (3) (behind a front flange (2b) of the post (2));
- characterized in that** the clamp (4) is fixed to said flank by attachment means (5) such that it is movable from said holding position to a non-
- 15 holding position, and vice versa, only in a direction towards the flank or away from it and that in the holding position it is exercising a clamping force in said direction.
2. Fence (1) according to claim 1, **characterized in that** the attachment
- 20 means (5) comprise at least one selfbreaking nut (5b).
3. Fence (1) according to claim 1 or 2, **characterized in that** the clamp (4)
- is also holding at least one horizontal wire (3a) of the fence panel (3) to the post (2) in the mounted position of the fence (1), such that the position
- 25 of the panel (3) relative to the post (2) is secured in the vertical direction.
4. Fence (1) according to any of the preceding claims, **characterized in that**
- the clamp (4) is holding several horizontal wires (3a) of the fence panel (3) to the post (2) in its holding position.

5. Fence (1) according to any of the preceding claims, **characterized in that** the distance between adjacent horizontal wires (3a) of the fence panel (3) is 2 to 10 times smaller than the distance between adjacent vertical wires (3b).
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6. Fence (1) according to claim 5, **characterized in that** the distance between adjacent horizontal wires(3a) is about 13 mm.
7. Fence (1) according to any of the preceding claims, **characterized in that** the clamp (4) comprises a plate (4a) and several legs (4b) extending substantially perpendicularly from and at one side of said plate (4a), together forming recesses (4c) for taking up horizontal (3a) and/or vertical (3b) wires for holding them to the post (2).
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8. Fence (1) according to claim 7, **characterized in that** said plate (4a) is substantially rectangular and that the legs (4b) extend from at least two opposite sides of the rectangular form.
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9. Fence (1) according to claim 8, **characterized in that** the legs (4b) extend from each side of the rectangular form.
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10. Fence (1) according to claim 8 or 9, **characterized in that** the plate (4a) is provided with at least three legs (4b) at each of two opposite sides of the rectangular form, forming at least two recesses (4c) for taking up at least two horizontal wires (3a) for fixing them to the post (2).
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11. Fence (1) according to any of claims 7 to 10, **characterized in that** the plate (4a) is provided with at least one hole (4d) for taking up at least one attachment means (5), such as a screw, for fixing the clamp (4) to the post (2).
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12. Fence (1) according to any of the preceding claims, **characterized in that** the fence panel (3) comprises at least one U- or V-shaped beam (3e) extending horizontally along the fence panel (3) and that the clamp (4) is fixed in the U- or V-shape of the beam (3e).

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13. Fence (1) according to any of the preceding claims, **characterized in that** the core (2a) of the post (2) is hollow.

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14. Fence (1) according to any of the preceding claims, **characterized in that** the post (2) is hollow.

15. Fence (1) according to any of the preceding claims, **characterized in that** the post (2) has a substantially I-shaped cross section.

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16. Fence (1) according to any of the preceding claims, **characterized in that** the core (2a) of the post (2) is provided with one or more holes (2d) for receiving attachment means (5), such as screws, for fixing the clamp (4) to the post (2).

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