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(54) Profile for obtaining fence posts for fixing panels without fittings

(57) The invention relates to a profile for obtaining fence posts for fixing panels without fittings. The profile has a specific configuration such that it facilitates and improves the electrostatic application of ground paint over the entire surface of the post. To that end, the profile has a series of perforated or cut hooks enabling the penetration of the paint therethrough. The profile is further configured to be able to be cut in order to obtain fence posts of different standard lengths.

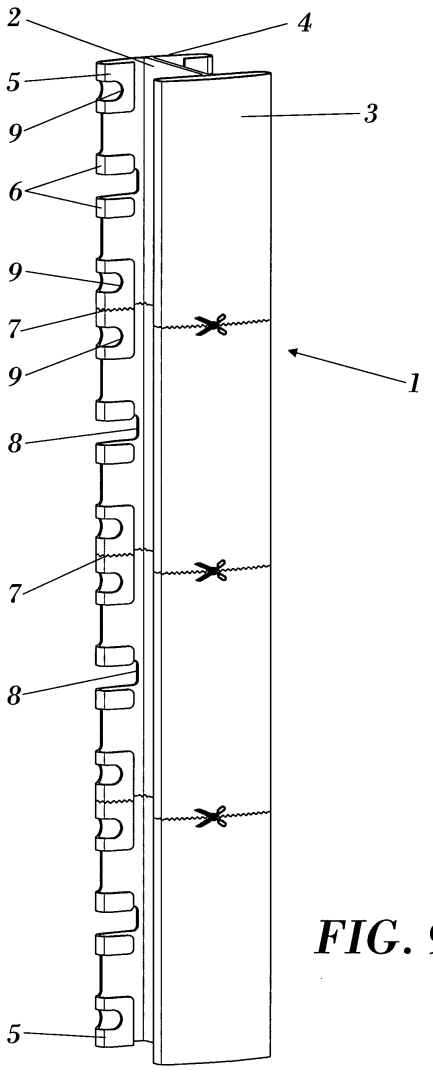

FIG. 9

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Description

Object of the Invention

[0001] The present invention is comprised in the field of profiles intended for obtaining fence posts of the type in which the panels are fixed directly to the post, without requiring the use of complementary fixing fittings.

[0002] The profile has been perfected in order to achieve an optimum and complete application of the electrostatic coating material, generally ground paint, on the entire surface of the profile, including the most remote and inaccessible areas.

[0003] The profile has likewise been perfected in order to provide formal and structural features which allow cutting the profile in order to obtain standard posts of different lengths.

Background of the Invention

[0004] There are currently several post designs and several solutions for fixing the panels to the posts. The invention is located in families of posts having an H-shaped section, to which post the panels forming the fence must be fixed.

[0005] The panels used in these types of fences and posts are formed by horizontal rods crossed by vertical rods, all of them electrowelded to one another. The vertical rods can have several bends or inflections in the shape of a triangle, the object to strengthen the panel.

[0006] There are several solutions on the market for fixing the rod panels electrowelded to the posts which can be comprised in two families:

a) Systems in which the panels are fixed to the post by means of fittings. Spanish patent 20053217, European patent EP 0935038 and European patent EP 1865128 belong to these types of solutions. These solutions are obviously expensive and require greater labor and assembly time in order to position the panel opposite the post and to fix and secure the fittings.

b) Systems which are fixed without fittings. There are two solutions within this group:

b.1) those that require cutting or eliminating part of the last vertical rod of the panel so that it does not interfere with the fixing. This solution weakens the panel and the fence at the same time because in addition to cutting the end vertical wire, it also requires eliminating part of the horizontal wire.

b.2) another solution allows the panel, without eliminating part of the last vertical rod, to be coupled directly to the post, which has hooks and notches allowing the coupling without the uneven area of the vertical rod interfering. French patent FR 2831584 and French patent FR 2872191 belong to this solution. It is evident that this is the most advantageous solution insofar as it does not require cutting part of the end rod and therefore weakening the panel, nor does it require the use of fittings, but rather the panel is directly placed opposite the post and is hooked thereto.

[0007] The posts used in these types of solutions usually have an H-shaped section, having a web and two end branches substantially perpendicular to the web. These end branches form the front and rear face of the post. The branch normally forming the front face is closed and the branch normally forming the rear face is open, the edges of which are folded towards the inside of the profile. This open branch is provided with hooks and notches for fixing the panel to the post.

[0008] Given that all fence systems are normally installed outdoors, they are subject to climate, meteorological and atmospheric conditions causing their deterioration, and particularly in areas where rain is frequent and the climate conditions are very adverse. The metal components of the fence, particularly the post, are therefore exposed to serious corrosion problems.

[0009] To that end, the most common solution to minimize the effects of corrosion and therefore increase the useful life of the fence installed outdoors, is the superficial application of ground paints, generally polyester, electrostatically applied.

[0010] The form of applying the electrostatic coating is based on the fact that the particles of ground paint running through the applicator mechanism transfer electrons and the particles are thus positively charged. In addition the parts to be pained are grounded, having a negative charge. Due to the fact that the electrical charges of the powder and of the parts are opposite, the particles are attracted by the part and are fixed thereto. This process ends with the melting or polymerization of the powder on the surface of the part when subjected to a curing oven.

[0011] It is essential that when applying the mentioned coating, i.e. the paint, that it is evenly distributed to all points of the surface of the post.

[0012] In the actual posts of the assembly without fittings type, the typical U-shape of the hooks intended to receive the end vertical wire of the panel, prevents the ground paint from penetrating and recoating the inner part thereof, which is also the area most sensitive to the action of corrosion for the following reasons:

- the presence of cracks on the surface of the sheet due to the effects of the profiling the hooks.
- the presence of humidity retained between the surface of the vertical wire of the panel housed in the hooks of the post and the posts.

[0013] The reason for the difficulty in coating the inner area of the hooks by means of electrostatic application

is the effect known as the Faraday Cage effect, which is a typical problem in parts having concavities. It has its origin in that the particles of ground paint in suspension are deposited in the entrance area of the concavity, and once the area is saturated, a positively charged electric field is generated blocking the passage of other particles inside the concavity.

[0014] The Faraday effect means that no profile for fences of the assembly without fittings type is completely protected against the corrosion of the inner area of the hooks and therefore reduces the useful life of the fence.

[0015] In addition the profiles for fences for demarcating plots are usually supplied at different heights; according to the height of the fence to be placed, the installer will choose one size or another. This forces the installers to have the different heights in stock, which generates important logistical problems and high storage costs.

Description of the Invention

[0016] The object of the proposed invention is a profile with a certain configuration such that it facilitates and improves the electrostatic application of the ground paint on the entire surface of the post. The profile has hooks with a certain configuration for allowing the flow of the ground paint therethrough, thus completely coating the inside preventing the Faraday Cage effect and considerably increasing the useful life of the product.

[0017] The profile object of the invention further has features suitable for being able to be cut to different sizes but with identical hook arrangement or geometry, thus obtaining posts of different sizes.

[0018] The profile is formed from folded sheet metal and has an H-shaped section, with a central web and two branches substantially perpendicular to said central web. One of the branches is closed and the other open with its edges curved towards the inside of the web of the profile.

[0019] End hooks, narrow hooks, double intermediate hooks and notches are provided on these curved edges, each hook forming a concave inner bottom.

[0020] All these hooks have a U-shaped section, which makes it difficult for the ground paint, used for coating the profile, to reach the concave inner bottom. The profile object of the invention has special hooks allowing the flow of the powder therethrough thus coating the inside of the concavity and preventing the previously mentioned Faraday effect.

[0021] In order to make this possible, at least part of the hooks have cavities which facilitates the penetration of the paint powder.

[0022] These cavities are located in the end hooks and in the double intermediate hooks. In the case of the narrow hooks, it is not necessary to have cavities, given that they are much smaller than the other two hooks and the so-called Faraday effect does not occur, or it is quite reduced.

[0023] The cavities made can be through holes or cuts eliminating part of the hook in the area oriented towards the web of the profile.

[0024] In addition, fences for demarcating plots are usually offered by the manufacturers and installers in different heights. The most standard measurements are 0.5, 0.6, 0.8, 1.0, 1.2, 1.5, 1.7, 2.0 and 2.5 m. This forces the people making the fences and installers to have the different heights in stock, which generates important logistical problems and high storage costs.

[0025] The solution to this problem consists of manufacturing, distributing and storing profiles in a standard measurement (generally 6 meters) from which the rest of the measurements are obtained by simply cutting the profile and obtaining the same hook arrangement or geometry.

[0026] In order to solve the problem that a fence installer has to have profiles of different heights depending on the size of the desired fence, the profile has been provided with intermediate hooks having a width twice that of the end hooks, the central shaft of the double hooks forming the cutting line of the profile for obtaining posts of different standard lengths. The length defined between the end of the profile and the central shaft of the first double intermediate hook is thus equal to the length existing between the central shafts of two correlative double intermediate hooks. Thus, from a standard measurement, which as mentioned is usually 6 meters, the rest of the measurements are obtained by simply cutting the profile along the central shaft of the corresponding double intermediate hooks.

[0027] The profile has likewise been perfected in order to obtain therefrom posts allowing a wide angling of the panel with respect to the post and thus adapting to different geometrical features of the surface to be fenced in. To that end the profile has notches, the depth of which substantially reaches the central web; the post can thus be adapted to virtually any corner or bend which can be found in the perimeter of a plot.

Description of the Drawings

[0028] To complement the description and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said specification, in which the following has been shown with an illustrative and non-limiting character:

Figure 1 shows a fence of the type that requires fixing fittings for fixing the panel to the post, in this case a brace.

Figure 2 shows a fence in which the panel is fixed to the post by means of fittings which are located between the two branches of the profile, the last vertical rod being shown against the web of the profile and secured by the fitting, in this case a clamp.

Figure 3 shows a solution which does not require fittings but in which it has been necessary to cut part

of the last vertical rod in order to be able to fix the ends of the horizontal rods to the hooks of the post.
Figure 4 shows a solution in which the profile has notches which allow directly fixing the panel without the last vertical rod being an obstacle.
Figure 5 schematically shows the application of the ground paint which is projected from the paint spray nozzle with the positively charged particles and attracted by the negatively charged object to be painted.
Figure 6 schematically shows the path of the ground particles and the application of said particles on the surface of the profile and the rejection of those that attempt to penetrate the concave area of the mentioned profile due to the Faraday effect.
Figure 7 shows a perspective view of the preferred embodiment of the profile object of the invention.
Figures 7.1 and 7.2 depict possible alternatives of the profile.
Figure 8 schematically shows the behavior of the particles of ground paint when the profile has the cavities object of the invention.
Figure 9 shows the profile object of the invention, in its preferred version, illustrating the cutting lines for obtaining posts of different standard lengths.
Figure 10 shows a post to which two panels have been fixed in which the notches allowing different angular positions of the panels are emphasized.

Preferred Embodiment of the Invention

[0029] All the systems depicted in Figures 1-4, either with fittings or without them, are intended to be used outside for demarcating plots. As has already been mentioned, in order to prevent the sheet metal from corroding, therefore reducing the useful life of the fence, a coating layer is usually applied by means of electrostatic application of ground paint, protecting the post from the climate conditions it will be subjected to.

[0030] Figure 5 schematically shows the application of the ground paint which is projected from the paint spray nozzle with the positively charged particles and attracted by the negatively charged object to be painted.

[0031] Figure 6 shows how the powder particles can not penetrate the concave bottom of the hook since the U-shape thereof prevents the paint from being introduced. The paint particles are deposited in the entrance of the concavity of the hook and once this area is saturated, a positively charged electric field blocking the passage to other particles to the bottom of the concavity is generated. Therefore a post of this type will never be efficiently protected against the effects of corrosion.

[0032] As observed in Figure 9, the profile (1) has an H-shaped section and is formed by a central web (2), a first branch (3) which is closed and a second branch (4) which is open. Both branches (3 and 4) are substantially perpendicular to the central web (2). As seen in Figure 9, the branch (4) has the edges curved towards the inside of the central web (2) of the profile (1). The end hooks (5), the narrow hooks (6), the double intermediate hooks (7) and the notches (8) are provided along these edges. The end hooks (5) and the double intermediate hooks (7), having a U-shaped section, have cavities, in this case through holes (9), in order to allow, as previously mentioned, the paint to penetrate the concave inner bottom of the mentioned hooks.

[0033] It is not necessary to make these cavities in narrow hooks since their width is smaller and therefore the paint can reach the bottom of its concavity without problems.

[0034] Figures 7.1 and 7.2 show other possible solutions. Figure 7.1 depicts a profile (1) in which the cavities are cuts (9') made in the end hooks (5) and in the double intermediate hooks (7). In Figure 7.2 cuts (9') have been made in the end hooks (5) and through holes (9) in the double intermediate hooks (7).

[0035] The cavities, either through holes (9) or cuts (9'), allow the ground paint to flow through the hooks reaching the inside of the concavity.

[0036] The profile (1) has double intermediate hooks (7) with a width twice that of the end hooks (5), the central shaft of the double intermediate hooks (7) forming the cutting line of the profile for obtaining posts of different standard lengths. This is illustrated in Figure 9, in which the cutting lines are seen, through which the profile could be cut and posts of the desired size thus obtained, as can be observed; the length (L) defined between the end of the profile and the central shaft of the first double intermediate hook (7) is equal to the distance existing between two consecutive double intermediate hooks. Thus in the factory or in the place of installation, it is possible to obtain posts the length of which is a multiple of L from a standard size profile (6 metros) by simply cutting said profile (1).

[0037] In addition the profile (1) has notches (8) to house the horizontal wires (10), depicted in Figure 10, the depth of which reaches the central web (2) of the profile (1), which allows the possibility of angling the panels (11) with respect to the post (12) to be maximum once the panel (11) is fixed to the post (12).

Claims

1. A profile for obtaining fence posts for fixing panels without fittings, the profile (1) being formed from folded sheet metal and having an H-shaped section, with a central web (2) and two branches (3 and 4) substantially perpendicular to the central web (2), the first branch (3) being closed and the second branch (4) open, the edges of the second branch (4) being curved towards the inside of the profile (1), on the edges of which end hooks (5), narrow hooks (6), double intermediate hooks (7) and notches (8) are provided, the end hooks (5), the narrow hooks (6) and the double intermediate hooks (7) forming a concave

inner bottom, **characterized in that** at least part of the hooks have cavities and **in that** the double intermediate hooks (7) have a width twice the width of the end hooks (5), the central shaft of the mentioned double intermediate hooks (7) forming a cutting line of the profile (1) for obtaining posts of different lengths.

2. A profile for obtaining fence posts for fixing panels without fittings according to claim 1, **characterized in that** the cavities are through holes (9) located on the concave inner bottom of the hook.

3. A profile for obtaining fence posts for fixing panels without fittings according to claim 1, **characterized in that** the cavities are cuts (9') eliminating part of the hook.

4. A profile for obtaining fence posts for fixing panels without fittings according to claims 1-3, **characterized in that** the length (L) defined between an end of the profile (1) and the central shaft of the first double intermediate hook (7) is equal to the length existing between the central shafts of two correlative double intermediate hooks.

5. A profile for obtaining fence posts for fixing panels without fittings according to any of the previous claims, **characterized in that** the depth of the notches (8) substantially reaches the central web (2) of the profile (1).

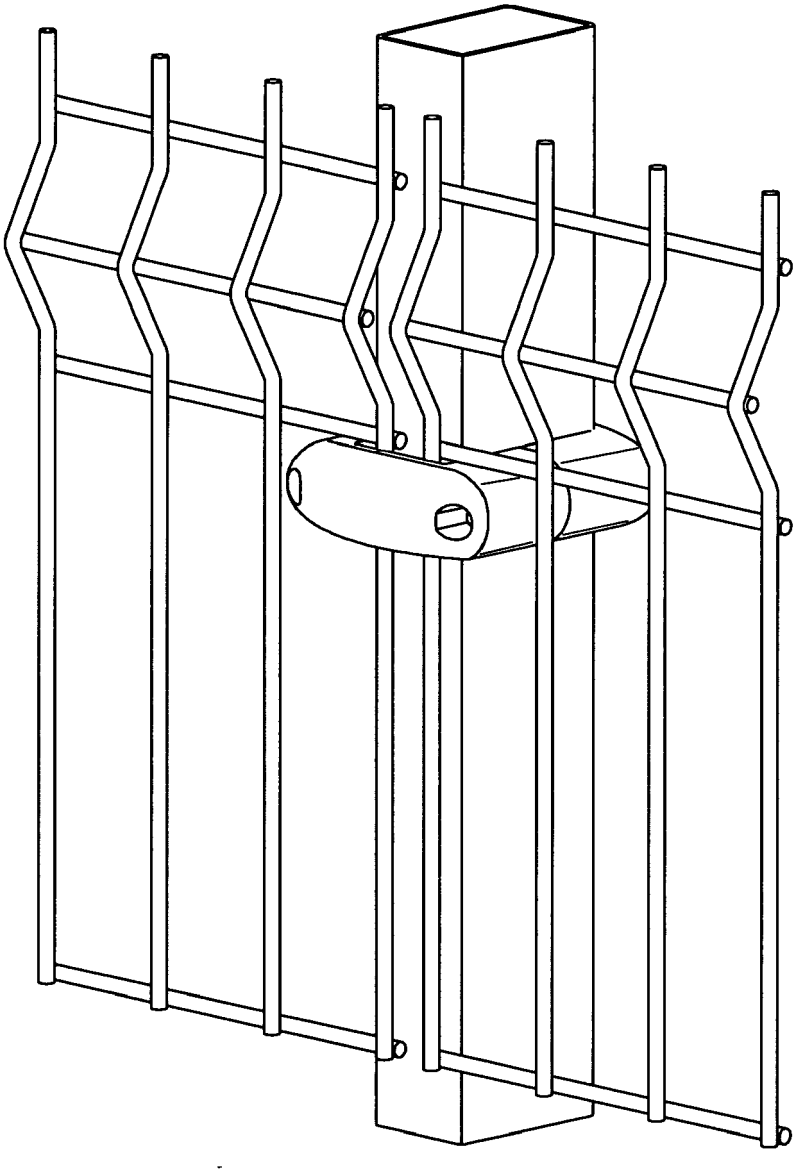

FIG. 1

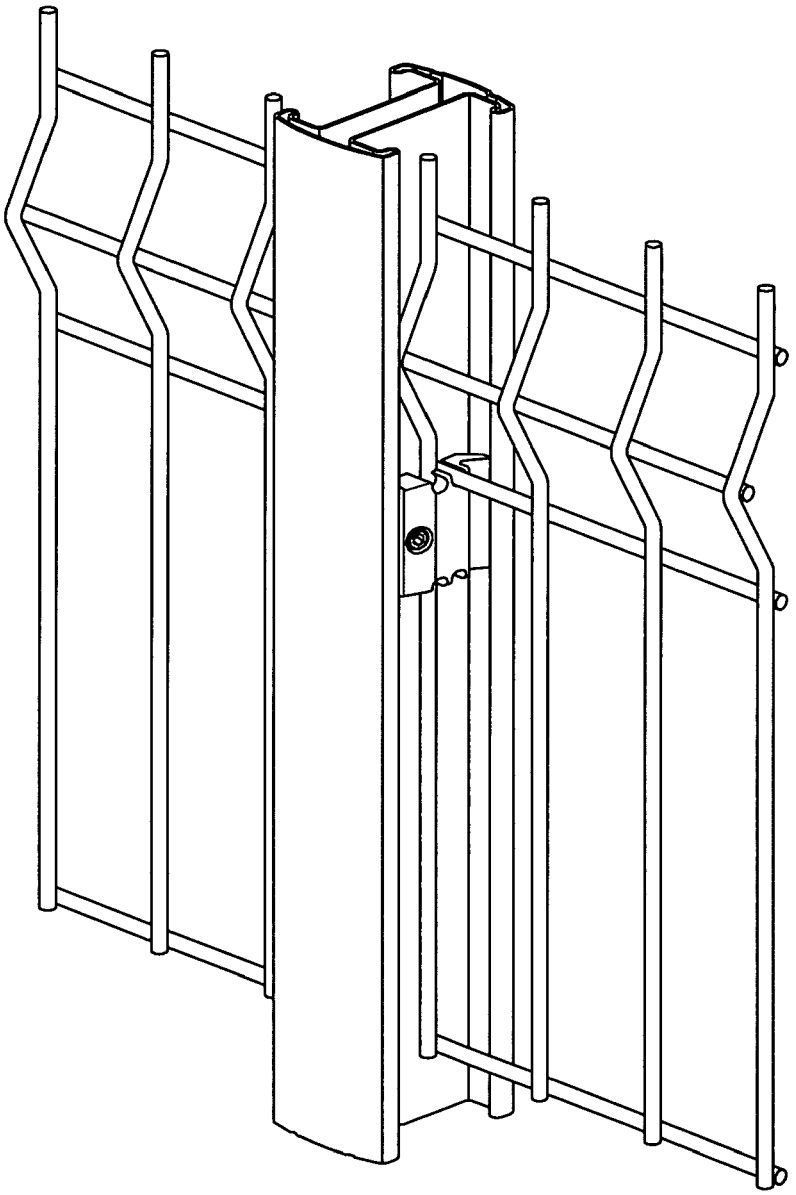

FIG. 2

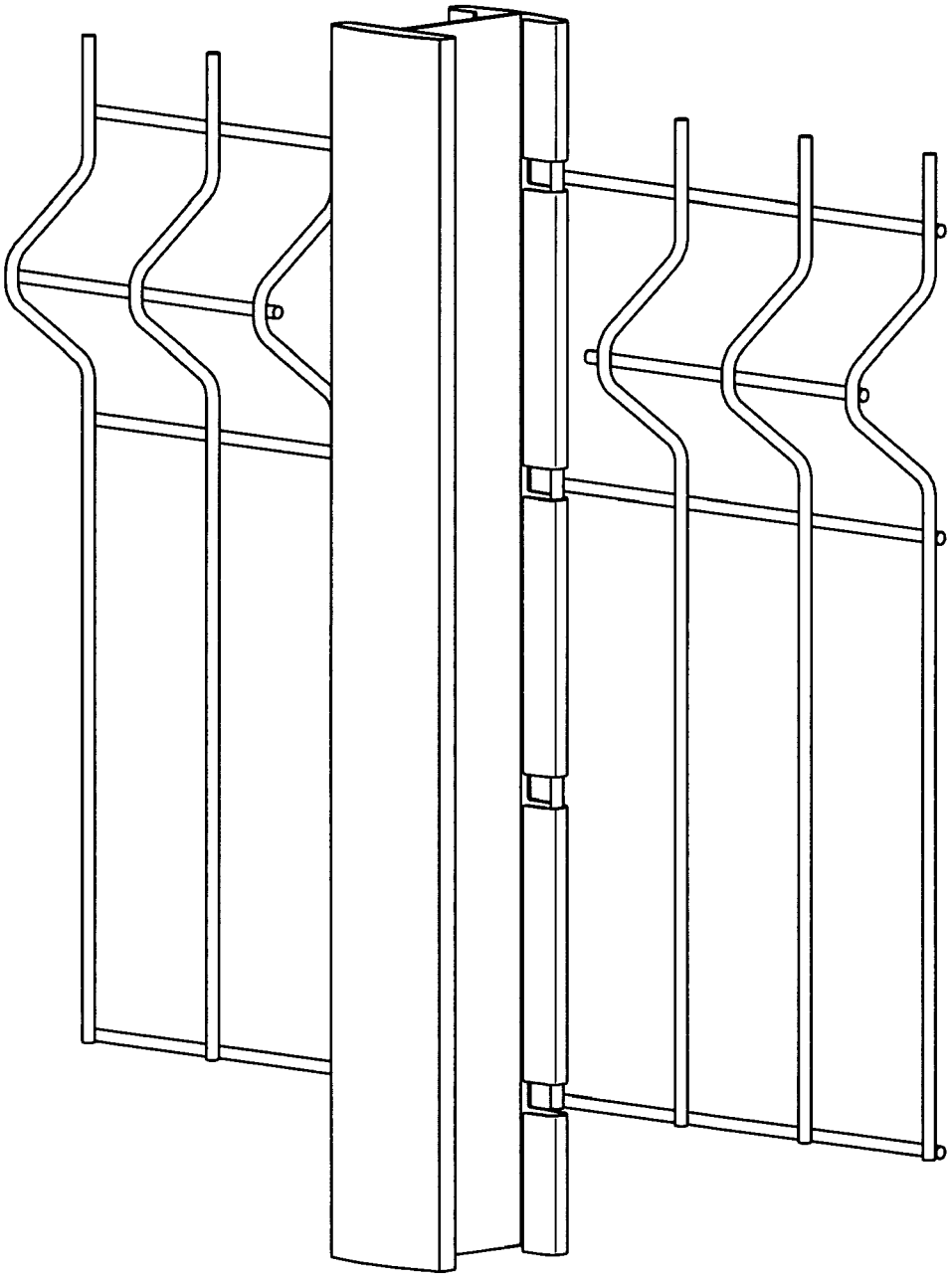

FIG. 3

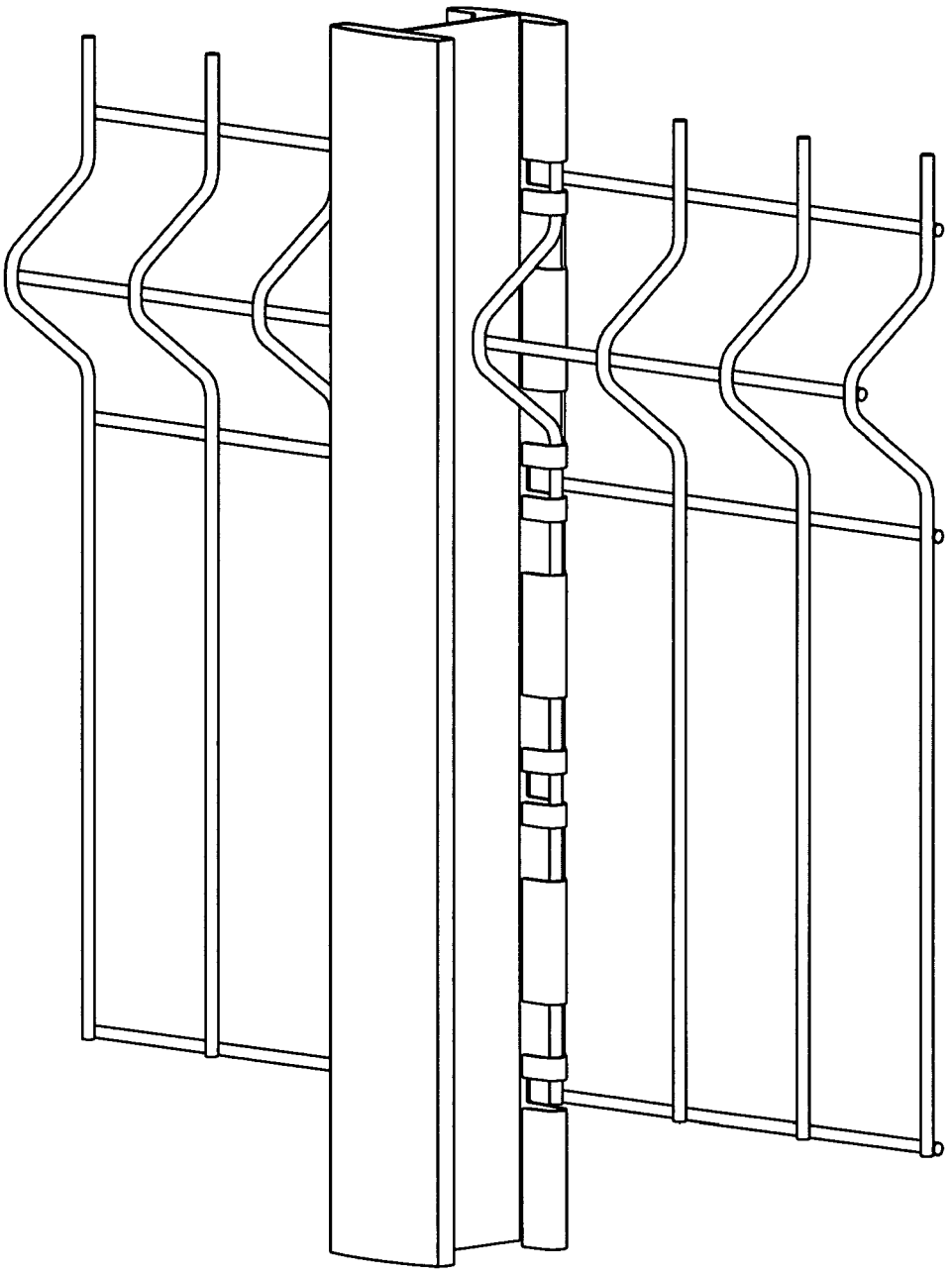

FIG. 4

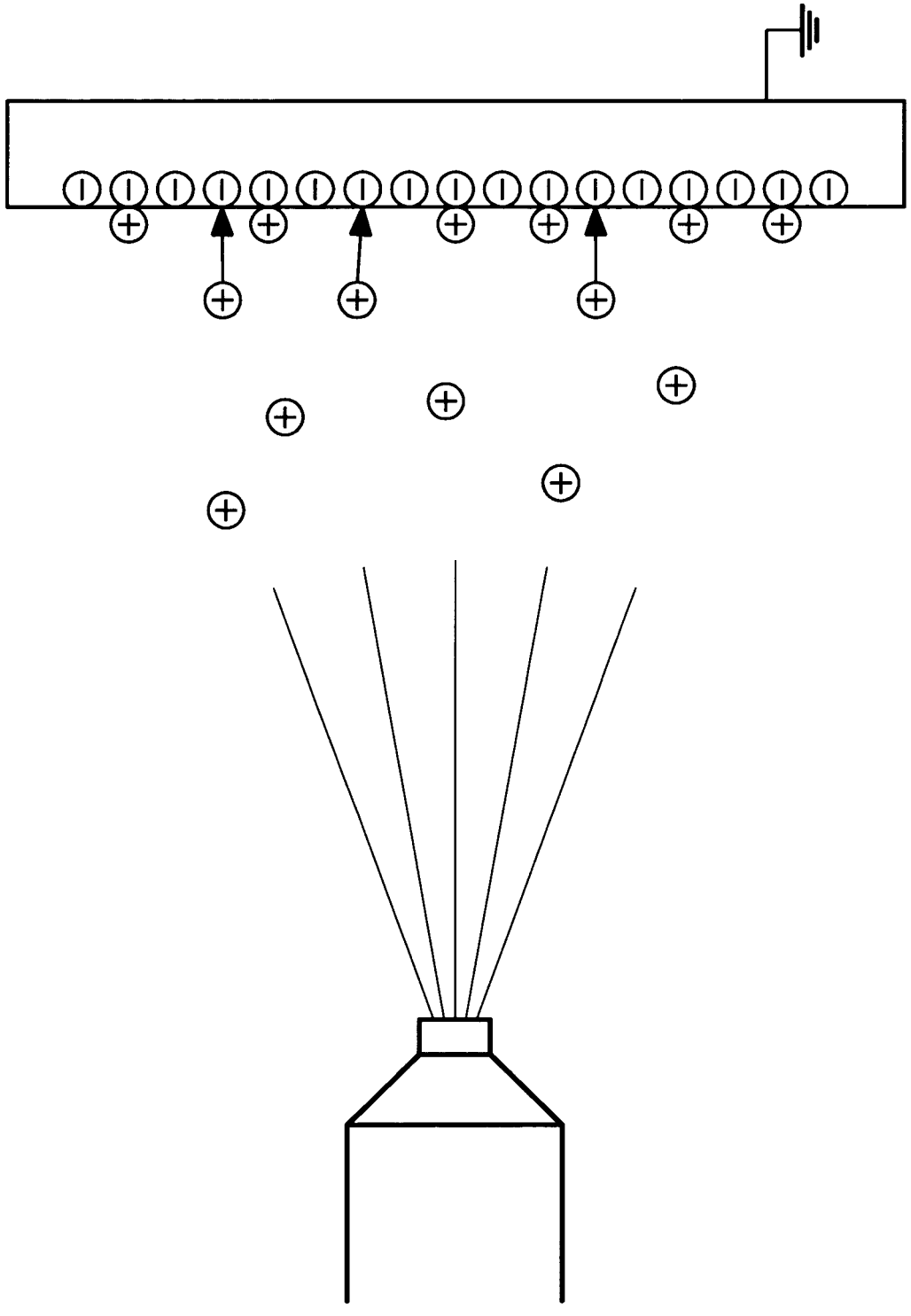

FIG. 5

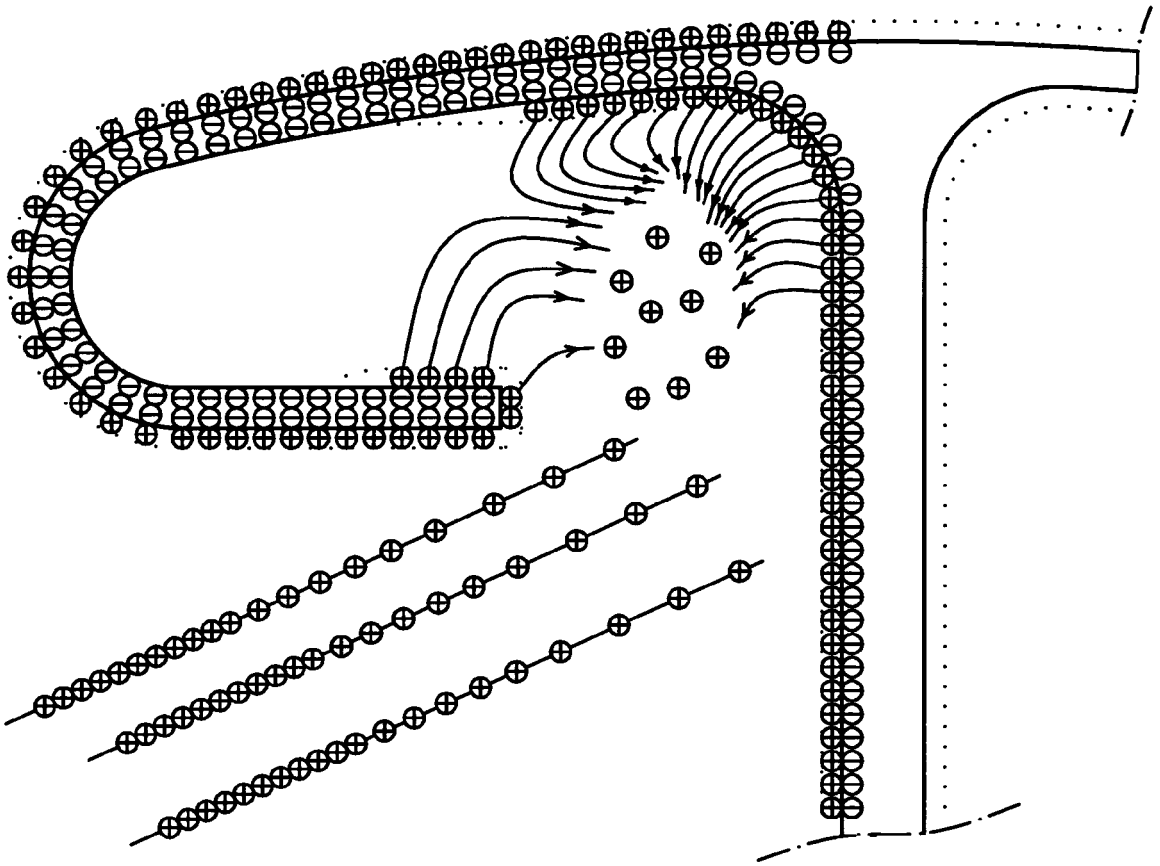

FIG. 6

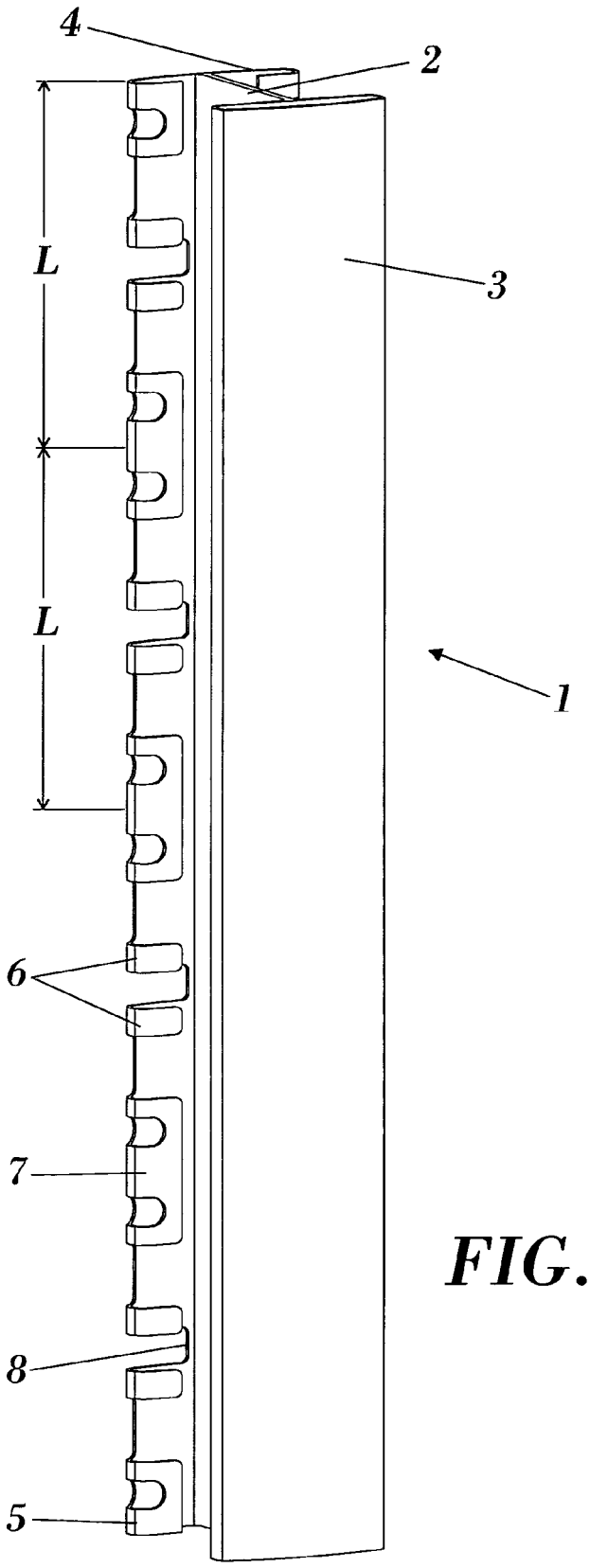

FIG. 7

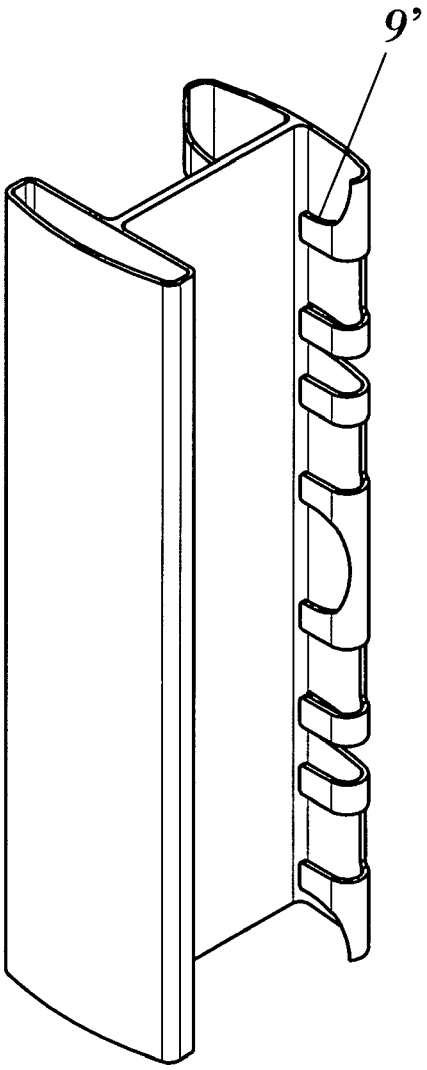

FIG. 7.1

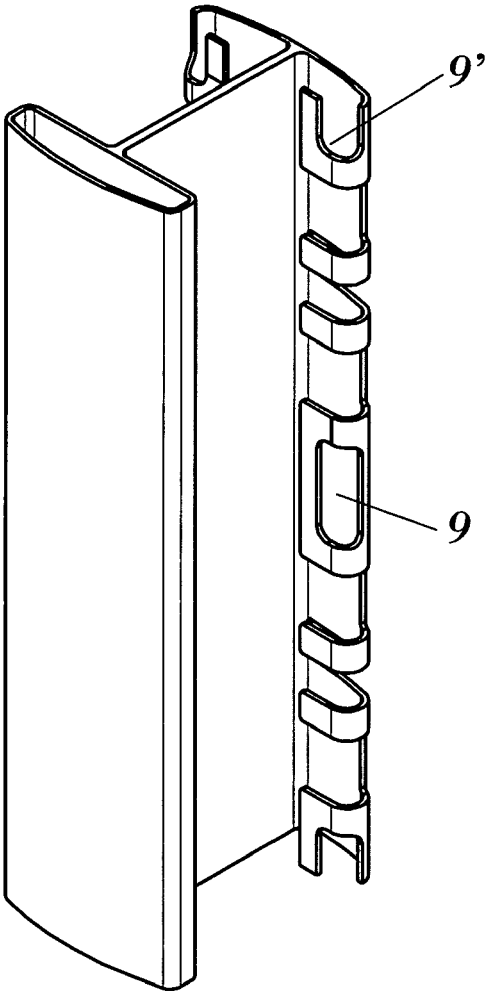

FIG. 7.2

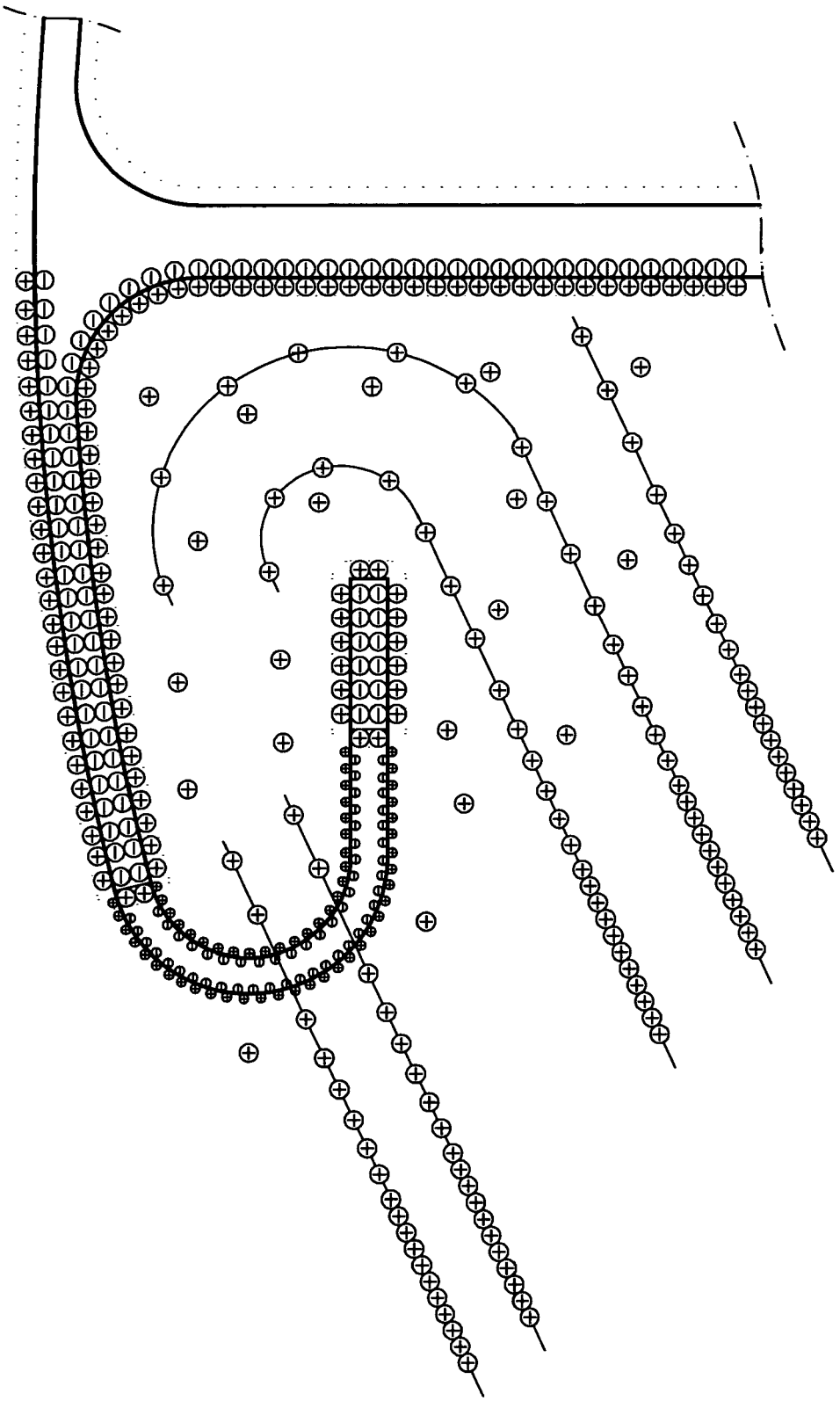

FIG. 8

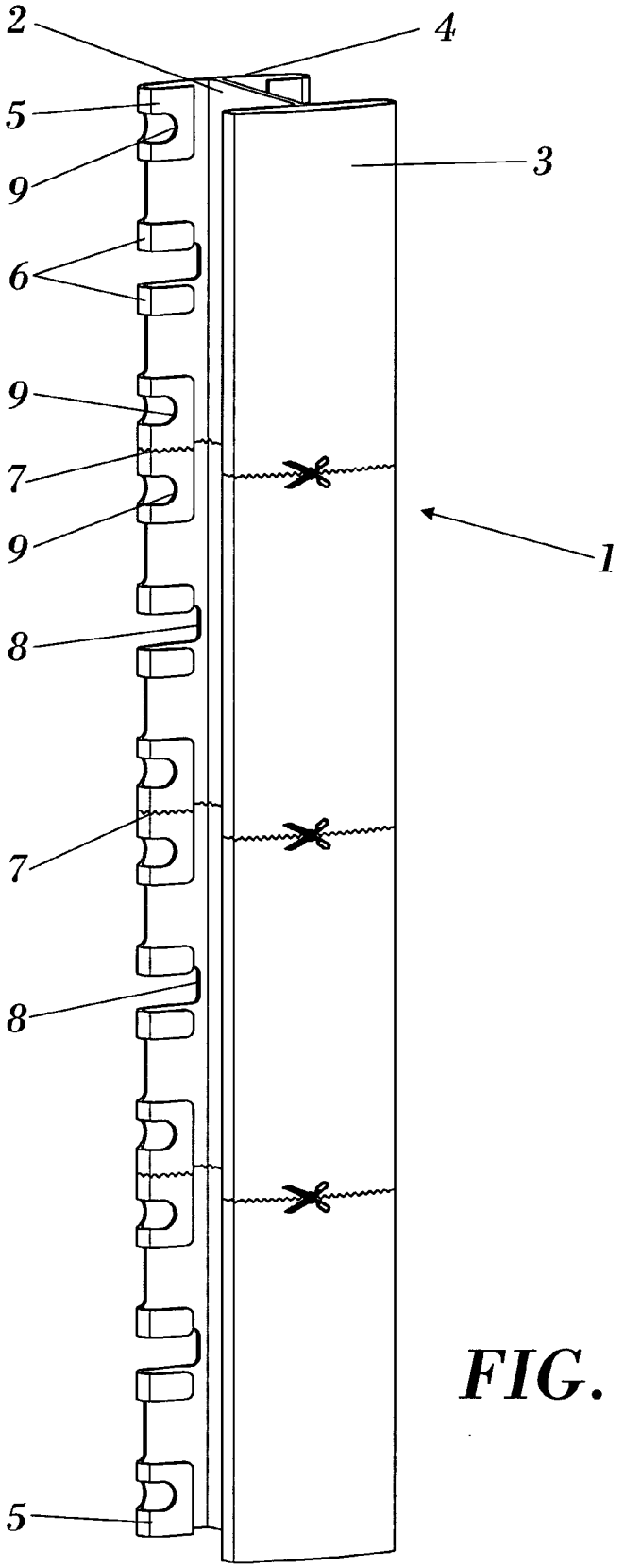

FIG. 9

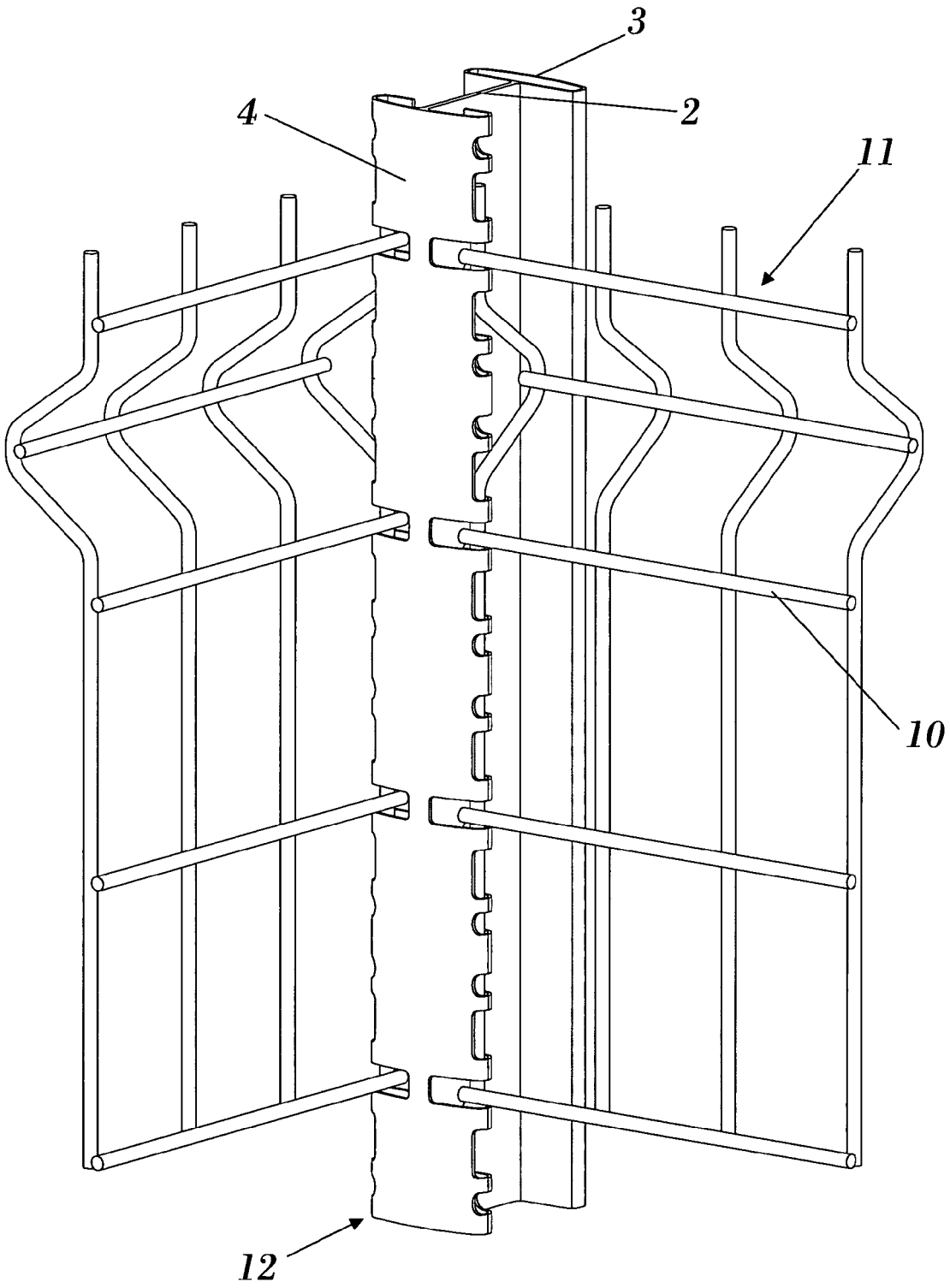

FIG. 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 38 0032

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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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
The Hague	10 July 2008	Zuurveld, Gerben

CATEGORY OF CITED DOCUMENTS

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10-07-2008

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

REFERENCES CITED IN THE DESCRIPTION

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