



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

(43) Date of publication:
25.07.2007 Bulletin 2007/30

(51) Int Cl.:
E04H 17/14 (2006.01)

(21) Application number: **04799515.4**

(86) International application number:
PCT/JP2004/016417

(22) Date of filing: **05.11.2004**

(87) International publication number:
WO 2006/048937 (11.05.2006 Gazette 2006/19)

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

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(54) **INTRUSION PREVETING DEVICE**

(57) Provided is an intrusion preventing device of a structure with excellent appearance for causing an intruder to catch his/her body in thorn portions to prevent intrusion.

A plurality of elongated stalk members 3 is provided in an installation base 1 to protrude, plate-shaped members 5 are provided to protrude through tributary stalk members 4, and pluralities of thorn portions 7 are pro-

vided in edge portions of the plate-shaped members 5 to protrude. The plate-shaped members 5 are arranged spatially in three-dimensions, and the intruder is caught in the thorn portions 7 in the edge portions of the members 5 and prevented from intruding. The entire device can be provided with a shape imitating the form of a plant, has decorative characteristics, and does not impair the appearance.

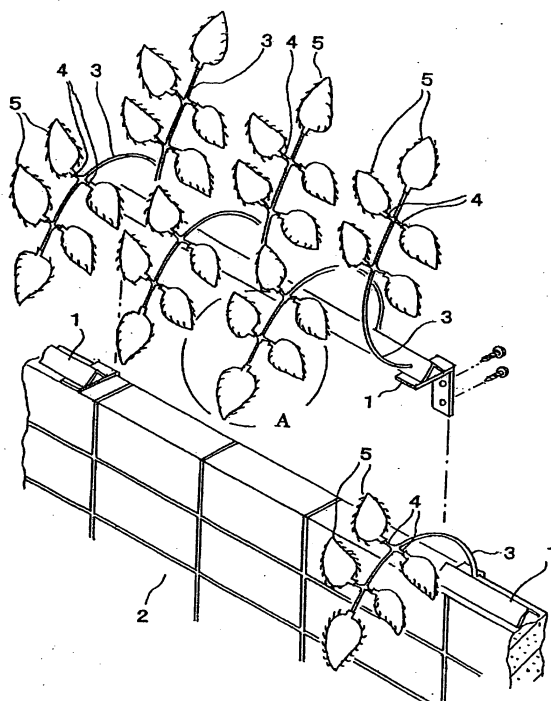


FIG. 1

Description

Technical Field

[0001] The present invention relates to an intrusion preventing device which is installed in a structure such as, for example, a wall, fence, wall face in the vicinity of a window of a building and the like and prevents trespassing on a ground and building. More particularly, the present invention relates to an intrusion preventing device that physically prevents intrusion into a ground and building without impairing the appearance of the architectural structure.

Background Art

[0002] Conventionally, various devices such as surveillance cameras, intrusion sensing devices and the like have been developed to prevent trespassing on grounds and buildings. However, the devices simply take a picture of an intruder or sense an intruder, and are not able to prevent intrusion only by taking the picture or sensing the intruder. Therefore, in the case where such a device is installed, an observer always monitors, and when finding an intruder, needs to take action such as blocking intrusion, calling police and the like. The devices thus have problems that the installation cost and running cost are high.

[0003] In order to physically prevent trespass at low cost, it is effective to string the barbed wire on a fence and the like. However, when the barbed wire is thus strung, the appearance becomes coercive and seriously impairs the appearance of the structure. Therefore, the barbed wire is only applicable to plants, yards for materials and the like, and is actually difficult to install in houses, hotels, hospitals, public facilities and the like.

[0004] Further, to string the barbed wire on the fence and the like, it is general to place struts to protrude at predetermined intervals on the fence and the like, and hang a plurality of pieces of barbed wire between struts. However, in such installation, when an intruder wears thick leather gloves, the intruder may use the barbed wire near the strut as holds for his/her hand and foot to climb, and intrude easily.

[0005] Furthermore, when the barbed wire is strung, it is effective to string the barbed wire in the shape of a three-dimensional curve such as a spiral-shape and the like rather than a linear form. However, thus strung barbed wire makes the appearance more coercive, and can be applied to only specific structures.

[0006] Moreover, when the barbed wire is extended to handle, the wire tends to get tangled, and the possibility naturally arises that the operator sustains an injury. Therefore, installation of the barbed wire requires efforts, considerable caution and results in another problem that the installation cost is high.

[0007] In order to solve such problems, various intrusion preventing devices have conventionally been devel-

oped. For example, Patent Document 1 discloses a device such that cuts are made obliquely in an edge portion of a band-shaped metal plate to form a plurality of thorn members. In this device, the band-shaped metal plate is wound in the shape of a roll, and thereby made compact to be stored. When the device is strung, by drawing and twisting the band-shaped metal plate, the thorn members protrude, and produce the intrusion preventing effect. This device is considered easy to string and high in the intrusion preventing effect, but still impairs the appearance, and in this respect, does not have much difference from the conventional barbed wire.

[0008] Further, Patent Document 2 discloses a device such that synthetic-resin members having star-shaped thorns are attached to stainless wire at predetermined intervals. This device improves the appearance to some extent, but the appearance still becomes coercive, and installation of such a wire material requires efforts as in the conventional barbed wire.

[0009] Furthermore, Patent Document 3 discloses a device such that a metal plate is punched to cause many sharp claw pieces to protrude. This device is easy to install, and likely improves the appearance to some extent, but is not considered so high in the intrusion preventing effect because the device is arranged only in a plane on the top face of a wall or fence.

[0010] Still furthermore, Patent Document 4 discloses a device such that thorn cylindrical members with thorns protruding radially are attached rotatably to an upper edge of a fence body. This device improves the appearance to some extent, but is not so high in the intrusion preventing effect, complicated in structure and considered high in cost.

Patent Document 1: Japanese Un examined Patent Publication No. 2003-20822

Patent Document 2: Publication of Registered Utility Model Applications No. 3042748

Patent Document 3: Utility Model Gazette No. H06-20804 Patent Document 4: Japanese Unexamined Patent Publication No. H11-256882

Disclosure of Invention

Problems to be Solved by the Invention

[0011] The invention provides an intrusion preventing device of a structure enabling trespass to be reliably prevented without impairing the appearance of the structure such as a wall, fence, building and the like. Means for Solving the Problem

[0012] A device as described in claim 1 has an elongated stalk member, and plate-shaped members provided in at least one of a front end portion and a middle portion of the stalk member to protrude, where a plurality of thorn members is provided in an edge portion of each of the plate-shaped members to protrude.

[0013] Further, a device as described in claim 2 has

an installation base to be installed in a structure, the stalk member protrudes from the installation base, and the plate-shaped members are provided in at least one of the front end portion and the middle portion of the stalk member.

[0014] Furthermore, in a device as described in claim 3, the stalk member has a bending form enabling the stalk member to be arranged along the structure, and a plurality of the plate-shaped members is provided in the middle portion of the stalk member to protrude.

[0015] Still furthermore, in a device as described in claim 4, each of the plate-shaped members is formed of a metal material, and each of the thorn portions is formed by bending, in the form of a hook in the plate-thickness direction, a triangular portion formed of a cut portion obtained by cutting obliquely in the edge portion of each of the plate-shaped members.

[0016] Moreover, in a device as described in claim 5, the plate-shaped members are arranged in three-dimensions in three-dimensional space, and the thorn portions to protrude are not provided in edge portions of at least plate-shaped members arranged on the outermost side at one side.

Advantageous Effect of the Invention

[0017] In the intrusion preventing device of claim 1, since the plate-shaped members are arranged spatially in three-dimensions, when an intruder tries to pass through, part of his/her body comes into contact with edge portions of the plate-shaped members lengthwise, clothes and the like are caught in the thorn portions of the edge portions, and the intruder is reliably prevented from further intruding. Further, for example, when the stalk member is assumed to be a branch or stem of a plant, and the plate-shaped member is formed in the shape of a leaf of the plant, the entire intrusion preventing device can imitate the form of a plant, has the same decorative characteristics as those of building decorative hardware, and does not impair the appearance.

[0018] In the intrusion preventing device of claim 2, since the plate-shaped members are arranged spatially in three-dimensions more efficiently, the body of the intruder more effectively comes into contact with the plate-shaped members lengthwise, and is caught more effectively in the thorn portions of the plate-shaped members, and the effect of intrusion prevention is exerted more significantly. Further, the shape is close to the form of a plant, and the entire intrusion preventing device can thereby imitate the form of a plant more closely, and improves the appearance.

[0019] In the intrusion preventing device of claim 3, since the plate-shaped members are arranged spatially in three-dimensions more efficiently, the body of the intruder more effectively comes into contact with the plate-shaped members lengthwise, and is caught more effectively in the thorn portions, and the effect of intrusion prevention is exerted more significantly. Further, the shape

is close to the form of a liana, and the entire intrusion preventing device can thereby imitate the form of a plant more closely, and improves the appearance, while facilitating manufacturing thereof.

[0020] In the intrusion preventing device of claim 4, a number of thorn portions can be formed easily and efficiently. Further, when cut portions are formed by a shearing tool or shearing die, triangular portions formed of the cut portions are spontaneously bent to form thorn portions, and it is thus possible to efficiently form the thorn portions. Furthermore, the thorn portions formed of such cuts have extremely sharp tips while being bent in the shape of a hook, and are able to produce the significant intrusion preventing effect.

[0021] Further, in the intrusion preventing device of claim 5, among a plurality of plate-shaped members arranged spatially in three-dimensions, the thorn portions to protrude are not provided in edge portions of plate-shaped members positioned on the outermost side. Accordingly, when a person erroneously touches the intrusion preventing device in passing by the device, taking care of a plant, and the like, since the thorn portions are not formed in the plate-shaped members on the outermost side, the person does not sustain an injury.

Meanwhile, when a trespasser tries to intrude, the trespasser is caught in the thorn portion of inward plate-shaped members, and the device thus produces the intrusion preventing effect.

Best Mode for Carrying Out the Invention

[0022] An intrusion preventing device of the invention is comprised of an elongated stalk member, and plate-shaped members, the plate-shaped members are provided in at least one of a front end portion and a middle portion of the stalk member to protrude, and a plurality of thorn members is provided in an edge portion of each of the plate-shaped members to protrude.

[0023] Accordingly, since the plate-shaped members are arranged spatially in three-dimensions, when an intruder tries to pass through, the intruder comes into contact in part of his/her body with edge portions of the plate-shaped members lengthwise, catches his/her clothes or the like in the thorn portions of the edge portions, and is reliably prevented from further intruding.

Embodiment 1

[0024] Embodiment 1 will be described below with reference to FIGs. 1 to 5. A device of this Embodiment is installed on the top of a wall or fence, imitates the form of leaves and stems of a rose, and thus is configured to also produce the effect as building decorative hardware.

[0025] "1" in the figure is an installation base, and configured to be installed on the top of a concrete wall and the like. The installation base 1 is formed in a predetermined length for conveyance and installation, for example, in unit length of 930 mm or 1000 mm, and the bases

1 are installed on the top of a concrete wall 2 to be continuous.

[0026] Then, a plurality of stalk members 3 is provided and protrudes from the installation base 1. The stalk members 3 are configured to have moderate flexibility and rigidity, and for example, in this Embodiment, iron wire materials each with a diameter of 5 mm are used, and welded at their base portion to the installation base 1. The stalk members 3 are bent in middle portions to increase decorative characteristics and complexity i.e. so that the bending direction of the members cannot be expected when an external force acts on the stalk members 3. In this Embodiment, relatively short tributary stalk members 4 each in the shape of a cross are welded to the frond end portions of the stalk members 3 to protrude, and this shape imitates leaves and stems of a rose. In addition, several kinds of stalk members 3 different in bending form while having a basic common shape are mixed to protrude, and configured to increase the complexity and enhance the decorative characteristics.

[0027] Then, plate-shaped members 5 are fixed to tip portions of the stalk members 3 and tributary stalk members 4. In the case of this Embodiment, each of the plate-shaped members 5 is formed by punching a steel plate with a thickness of 1.0 mm, and has a shape of imitating a leaf of a rose. Then, a base portion of each of the plate-shaped members 5 is formed in the shape of a pipe to form an attaching portion 6, each of the tip portions of the stalk members 3 and tributary stalk members 4 is inserted into the attaching portion 6, spot welding is made on thereabove, and the members 5 are thus fixed.

[0028] Further, a plurality of thorn portions 7 is integrally formed in the periphery of each of the plate-shaped members 5. As shown in FIGs. 2 to 5, a cut portion 8 is formed obliquely in the edge portion of the plate-shaped member 5, and each of the thorn portions 7 is formed by bending the triangular portion formed of the cut portion 8 in the plate-thickness direction. In addition, when the thorn portion 7 is formed, as shown in FIG. 5, by using a tip snip, or a shearing tool or shearing die having a pair of shearing blades 9, 10 with an angle formed therebetween, the triangular portion is spontaneously bent in the plate-thickness direction concurrently with formation of the cut portion 8, and does not need to be bent particularly in a different step.

[0029] In addition, in this Embodiment, as shown in FIG. 3, the thorn portions 7 protrude in opposite directions with respect to the plate-thickness direction at the left and right edge portions of the plate-shaped member 5, and for example, are configured to protrude from the front side of the plate-shaped member 5 at the right edge portion while protruding from the back side of the plate-shaped member 5 at the left edge portion. In such a configuration, when the body of an intruder comes into contact with either of the front side and back side of the plate-shaped member 5, the intruder is caught in the thorn portions 7 of the either side. Naturally, corresponding to conditions of the configuration and the like of the entire

intrusion preventing device, thorn members at left and right edge portions may protrude in the same direction at the front side and back side.

[0030] The thorn portions 7 thus formed of the cut portions 8 in the edge portion have extremely sharp tips.

The protrusion dimensions, the bending angle and the like of the thorn portion 7 are set according to the size of the entire intrusion preventing device, installation conditions and the like, and are preferably set at sizes and angle to such an extent that a trespasser catches his/her clothes in the portions 7 and feels a light pain, because it is not preferable that even the trespasser sustains an injury in the body.

[0031] Further, the cut portion 8 of the plate-shaped member 5 is obliquely cut from the front end side to the base side of the plate-shaped member 5 imitating a leaf of a rose. Accordingly, each thorn portion 7 protrudes toward the front end side, and bends toward the base side.

Therefore, when clothes or the like of the trespasser are caught in the thorn portions 7 of the plate-shaped members 5, the clothes or the like cannot be removed easily, and it is possible to obtain the great intrusion preventing effect. Further, in general, there are many leaves of a rose or other plants having sawtooth concavity and convexity toward the front end side in the edge portion thereof, and the thorn portions 7 provided to protrude in the above-mentioned direction seem to be normal, and do not impair the effect as a decorative material.

[0032] Furthermore, the stalk members 3 and plate-shaped members 5 are also arranged in the same way as in natural plants i.e. are arranged toward the outside from the center i.e. the installation base 1 as a whole, accordingly comfortable as a decorative material, and configured so that when a hand, foot and/or part of the body of an intruder is inserted in between the stalk members 3 and/or plate-shaped members 5, the intruder catches his/her cloths or the like in the thorn portions 7 bending toward the base portion, and cannot get out thereof easily.

[0033] Still furthermore, intervals between the stalk members 3 or plate-shaped members 5 are set at such intervals that when a hand and/or foot of an intruder is pressed from above or side of the intrusion preventing device, the stalk members 3 and plate-shaped members 5 are distorted, and that the hand, foot and/or part of the body is embedded in the members. Moreover, the effect of intrusion preventing is higher in the case where the plate-shaped members imitating the shape of leaves are arranged randomly to face all directions as in this Embodiment than the case where the members are arranged regularly.

[0034] The action of aforementioned Embodiment 1 will be described below. As shown in FIG. 1, the intrusion preventing device is installed on the top of the concrete wall 2 continuously. In addition, in the case of this Embodiment, the device has installation bases 1, it is only required for the bases 1 to be fixed on the top of the

concrete wall 2 using concrete bolts or the like, and the installation work is more efficient in this device than in stringing the barbed wire difficult to handle.

[0035] When a trespasser climbs over the concrete wall 2 or gets on top of the concrete wall 2 to climb up on the roof of the building or the like, the trespasser needs to put his/her hand on the upper edge of the concrete wall 2 and put his/her foot on the top of the concrete wall 2. Accordingly, in such a case, the hand, foot and/or part of the body of the trespasser is caught in the thorn portions 7 of the plate-shaped members 5 of the intrusion preventing device, and the trespasser is prevented from further intruding.

[0036] Further, in this Embodiment, since the stalk members 3 are easy to bend, and the stalk members 3 and plate-shaped members 5 are arranged relatively densely, even when an intruder wearing thick lather gloves and shoes with thick bottoms grasps the stalk member 3 to climb up, or steps on the stalk member 3, the stalk member 3 bends, and the thorn portions 7 of plate-shaped members 5 of an adjacent stalk member 3 scratch the foot and/or hand of the intruder, and prevent the intruder from intruding.

[0037] In addition, in this Embodiment, to improve the effect of intrusion prevention and enhance decorative characteristics, the stalk members 3 and plate-shaped members 5 are disposed relatively densely, and it is configured that the plate-shaped member 5 comes into direct contact with the body of the intruder. However, when the members are disposed at large intervals to reduce the cost, the members are arranged so that the stalk members 3 are disposed across an intrusion path. In such an arrangement, when an intruder bumps his/her body against the stalk member 3, the member 3 bends, an edge portion of the plate-shaped member 5 provided in the stalk member 3 to protrude finally comes into contact with the body of the intruder, the intruder catches his/her body in the thorn portions 7, and it is thereby possible to reliably prevent the intrusion.

[0038] Further, the device in this Embodiment resembles the form of a rose tree in entire shape, has the same decorative characteristics as those of building decorative hardware, is not coercive, and does not impair the appearance of a building. Accordingly, the device is applicable to houses, hotels, hospitals, public facilities and the like.

Embodiment 2

[0039] FIGs.6 and 7 show Embodiment 2 of the invention. In this device, for example, a stalk member 13 is made of an iron wire material with a diameter of 5 mm, and formed to be relatively long. Then, the stalk member 13 makes a spatial three-dimensional shape such as a spiral shape, bending shape and the like, and has a linear shape as a whole to enable the member 13 to be placed along a wall, fence, a wall face in the vicinity of a window of a building, and the like. Then, a plurality of cross-

shaped tributary stalk members 14 as shown in FIG. 7 is provided in the stalk member 13 to protrude, and to the front end portion of each of the tributary stalk members 14 is attached a plate-shaped member 5 with the shape imitating a leaf of a rose in the same way as described previously. In addition, reference numeral "11" is mounting hardware.

[0040] The device of Embodiment 2 configured as described above is installed on the top of the concrete wall 2 or the like as shown in FIG. 6. Then, since the stalk member 13 is bent, the plate-shaped members 5 are arranged spatially in three-dimensions. Accordingly, when an intruder tries to climb up the concrete wall 2, the intruder comes into contact in his/her body with the plate-shaped members 5, is caught in the thorn portions 7, and is prevented from intruding. In addition, also in the case where installation intervals of the plate-shaped members 5 are long, as described previously, when the intruder bumps his/her body against the stalk member 13 and/or tributary stalk member 14, the plate-shaped member 5 finally comes into contact with the body of the intruder, and prevents the intrusion. Further, the device of this Embodiment has the form of a liana, for example, a liana rose, in entire shape, is high in decorative characteristics, and does not impair the appearance when the device is installed.

Example 3

[0041] FIG. 8 shows Embodiment 3 of the invention. The device of this Embodiment is suitable for being installed on the top of a net fence, lattice fence and the like, and has a simple form to be in harmony in design with the fence and to reduce the cost. Further, the device of this Embodiment eliminates the possibility that a person sustains an injury when the person erroneously touches the intrusion preventing device in passing by the device, taking care of a plant and the like, or the like.

[0042] "21" in the figure is an installation base, and the device is configured to be installed on the top of a fence 23 or the like by mounting hardware 22 or the like. Then, pluralities of stalk plate materials 24 and 25 are provided in the installation base 21 to protrude. Each of the stalk plate materials 24 and 25 is provided with a linear stalk member 26, and cross-shaped tributary stalk member 27 provided in the front end portion of the member 26 to protrude, plate-shaped members 28 and 29 are provided in front end portions of stalk members 26 and tributary stalk members 27, and the entire device has a form imitating branches and leaves of a rose.

The stalk plate materials 24 and 25 are arranged in three lines, a front line 30a, middle line 30b and back line 30, at predetermined intervals. Accordingly, the plate-shaped members 28 and 29 respectively of the stalk plate materials 24 and 25 are arranged in three-dimensions in predetermined three-dimensional space. Then, among the stalk plate materials 24 and 25 of three lines, the thorn portions are not formed in edge portions of the

plate-shaped members 28 of the stalk plate materials 24 on outward sides i.e. of the front line 30a and back line 30c. The thorn portions 7 in the shape of a hook are formed in edge portions of the plate-shaped members 29 of the stalk plate materials 25 on the inward side i.e. of the center line 30b. Accordingly, among the spatially arranged plate-shaped members 28 and 29, the thorn portions 7 are not formed in edge portions of the plate-shaped members 28 positioned on the outermost sides, while being formed in edge portions of the plate-shaped members 29 positioned inward.

[0043] In the device of Embodiment 3, since the thorn portions are not formed in the plate-shaped members 28 of the stalk plate materials 24 of lines 30a and 30c on both outward sides, when a person erroneously touches the stalk plate member 24 on the outward side in passing by the device, taking care of a plant, and the like, the person does not sustain an injury because the thorn portions are not formed in the plate-shaped members 28. Meanwhile, when a trespasser tries to intrude, the stalk plate materials 24 on both outward lines are distorted by the weight of the trespasser, or a hand, foot or the like of the trespasser enters between the plate-shaped members 28 of the stalk plate materials 24 on both outward lines, and the trespasser thereby catches his/her body in the thorn portions 7 of plate-shaped members 29 of inward stalk plate materials 25, and is prevented from intruding. In addition, in this case, the trespasser is restrained in action by engaging his/her hand, foot or the like in between the plate-shaped members 28 of the stalk plate members 24 on both outward lines, the hand, foot or the like of the trespasser caught in the thorn portions 7 of the plate-shaped members 29 of the inward stalk plate materials 25 becomes hard to escape from the thorn portions 7, and it is possible to obtain the significant intrusion preventing effect.

[0044] Further, the device of this Embodiment is simple in form and easy in manufacturing, and is not uncomfortable with a net fence, lattice fence and the like. Then, as described above, since a person does not sustain an injury when erroneously touching the device, the device can be installed on the top of a low fence or wall, and a fence or wall near which plants exist, and thus has wide uses.

[0045] In addition, in Embodiment 3, it is configured that the stalk plate members 24 and 25 are arranged in three lines, and that thorn portions are not formed in the plate-shaped members 28 of the stalk plate materials 24 in both outward lines. However, when the device is installed in a location with a small possibility that a person erroneously touches the device from one side, thorn portions may be not formed in edge portions only of the plate-shaped members 28 of the stalk plate materials in one outward line of both outward lines. In this case, the stalk plate materials may be provided in two lines.

[0046] In the case of this Embodiment, the entire shape is not limited to the above-mentioned shape, and may be the form of Embodiment 1 or 2 as described previously.

In this case, plate-shaped members with no thorn portions formed are arranged as plate-shaped members positioned on the outermost side among the plate-shaped members arranged in three-dimensional space.

[0047] In addition, the present invention is not limited to the above-mentioned Embodiments. For example, in the above-mentioned Embodiments, to make the arrangement of plate-shaped members dense or close to the form of a rose, plate-shaped members are attached to tributary stalk members protruding from the stalk members, but may be provided directly in the stalk members to protrude, and by this means, it is possible to facilitate manufacturing and reduce the cost. In the specification and the scope of claims of the invention, "being provided to protrude from the stalk member" includes cases that the plate-shaped member is provided to protrude directly or through the tributary stalk member and the like as described above, and the point is that the plate-shaped member is attached to spatially protrude from the stalk member to come into contact with the body of an intruder when bumping against the body of the intruder and bending.

[0048] Further, in the above-mentioned Embodiments, the stalk members, tributary stalk members, and plate-shaped members are configured in the shape imitating a rose tree, but may have a shape imitating the form of another plant. Furthermore, the stalk members, tributary stalk members, and plate-shaped members do not need to always imitate the shape of a plant, may have a geometrical shape, an abstract shape or the like, and can have any form corresponding to the design of a structure to install the device.

[0049] Moreover, the above-mentioned thorn portions are not limited necessarily to being formed by cutting obliquely the edge portion of the metal plate-shaped member, and for example, may be formed in the edge portion concurrently with the time of punching the plate-shaped member in press molding. The thorn portions in this case are not limited necessarily to bending hook-shaped portions, and can be standing-shaped, sawtooth, or another-shaped portions. Further, the plate-shaped member is not limited to the shape of a flat plate, and may be bent or twisted to imitate a leaf of a plant more closely.

[0050] Further, in the above-mentioned Embodiments, the stalk portions, tributary stalk portions, plate-shaped members and the like use steel products, but are not limited thereto, and may use stainless steel products.

When stainless steel products are thus used, coating is not necessary, the tip of the thorn portion does not rust, and it is thereby maintain sharpness of the tip of the thorn portion semipermanently. Furthermore, the plate-shaped members are not limited to metal, and may be obtained by integrally forming thorn portions using a synthetic resin material. Still furthermore, when piano wire, hard steel wire and the like with high rigidity is used for the stalk members and the like, the body of a trespasser caught in thorn portions becomes harder to escape, and

the intrusion preventing effect is higher.

[0051] Moreover, the above-mentioned Embodiments describe intrusion preventing devices installed on a wall, fence, building and the like as targets, but the invention is not limited to the device fixed to the building and the like. The intrusion preventing device may have a shape of a fence, plants or the like with a height such that it is impossible to climb over the device, and be installed in a road or boundary of grounds as a transportable intrusion preventing device. To block a road or ground to disable intrusion, the barbed wire has conventionally been strung in a spiral shape, but when installing the intrusion preventing device in the shape of a fence or the like as described above, coercive feeling as in the barbed wire is eliminated.

Industrial Applicability

[0052] In the intrusion preventing device of the invention, since the plate-shaped members provided in a front end or middle portion of the stalk member are arranged spatially in three-dimensions, when an intruder tries to pass through, part of his/her body comes into contact with edge portions of the plate-shaped members lengthwise, clothes and the like are caught in the thorn portions of the edge portions, and the intruder is reliably prevented from further intruding. Further, for example, when the stalk member is assumed to be a branch or stem of a plant, and the plate-shaped member is formed in the shape of a leaf of the plant, the entire intrusion preventing device can imitate the form of a plant, has the same decorative characteristics as those of building decorative hardware, and does not impair the appearance.

Brief Description of Drawings

[0053]

FIG. 1 is an entire perspective of a first embodiment of the invention (Embodiment 1);
 FIG. 2 is an enlarged perspective view of an A portion of FIG. 1 (Embodiment 1);
 FIG. 3 is a perspective view showing a plate-shaped member of FIG. 2 (Embodiment 1);
 FIG. 4 is a plan view to explain a method of producing a thorn portion of the plate-shaped member (Embodiment 1);
 FIG. 5 is a cross-sectional view taken along line 5-5 of FIG. 4 to explain the method of producing a thorn portion of the plate-shaped member (Embodiment 1);
 FIG. 6 is an entire perspective view of a second embodiment of the invention (Embodiment 2);
 FIG. 7 is an enlarged perspective view of a B portion of FIG. 6 (Embodiment 2); and
 FIG. 8 is an entire perspective view of a third embodiment of the invention (Embodiment 3).

Brief Descriptions of Symbols

[0054]

5	1	Installation base
	2	Concrete wall
	3	Stalk member
	4	Tributary stalk member
	5	Plate-shaped member
10	6	Attaching portion
	7	Thorn portion
	8	Cut portion
	9,10	Shearing blade
	11	Mounting hardware
15	13	Stalk member
	14	Tributary stalk member
	21	Installation base
	24,25	Stalk plate material
	26	Stalk member
20	27	Tributary stalk member
	28,29	Plate-shaped member

Claims

- 25 1. An intrusion preventing device comprising:
- an elongated stalk member; and
 plate-shaped members provided in at least one
 of a front end portion and a middle portion of the
 stalk member to protrude,
 wherein a plurality of thorn members is provided
 in an edge portion of each of the plate-shaped
 members to protrude.
- 30 2. The intrusion preventing device according to claim 1, further comprising:
- an installation base to be installed in a structure,
 wherein the stalk member protrudes from the installation base, and the plate-shaped members are provided in at least one of the front end portion and the middle portion of the stalk member.
- 35 3. The intrusion preventing device according to claim 1, wherein the stalk member has a bending form enabling the stalk member to be arranged along the structure, and a plurality of the plate-shaped members is provided in the middle portion of the stalk member to protrude.
- 40 4. The intrusion preventing device according to claim 1, wherein each of the plate-shaped members is formed of a metal material, and each of the thorn portions is formed by bending, in the form of a hook in the plate-thickness direction, a triangular portion formed of a cut portion obtained by cutting obliquely

in the edge portion of each of the plate-shaped members.

5. The intrusion preventing device according to claim 1, wherein the plate-shaped members are arranged in three-dimensions in three-dimensional space, and the thorn portions to protrude are not provided in edge portions of at least plate-shaped members arranged on the outermost side at one side

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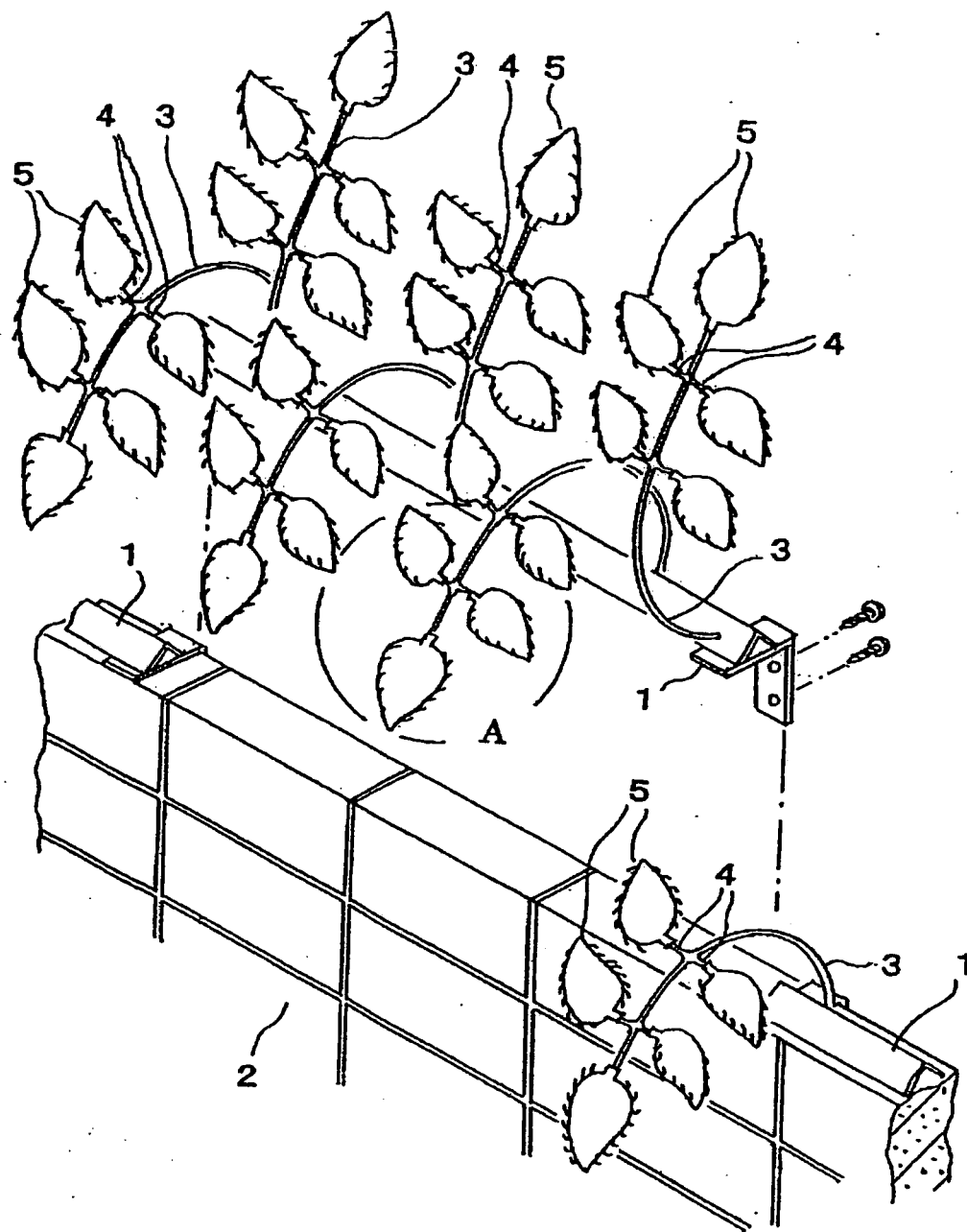


FIG. 1

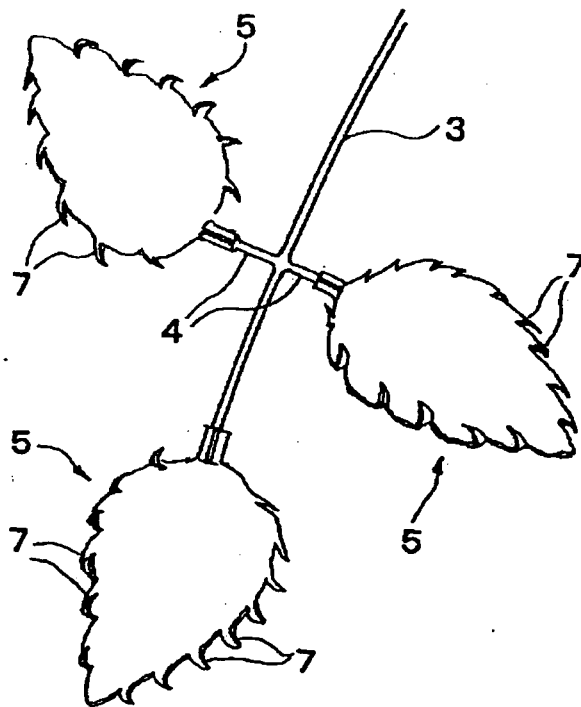


FIG. 2

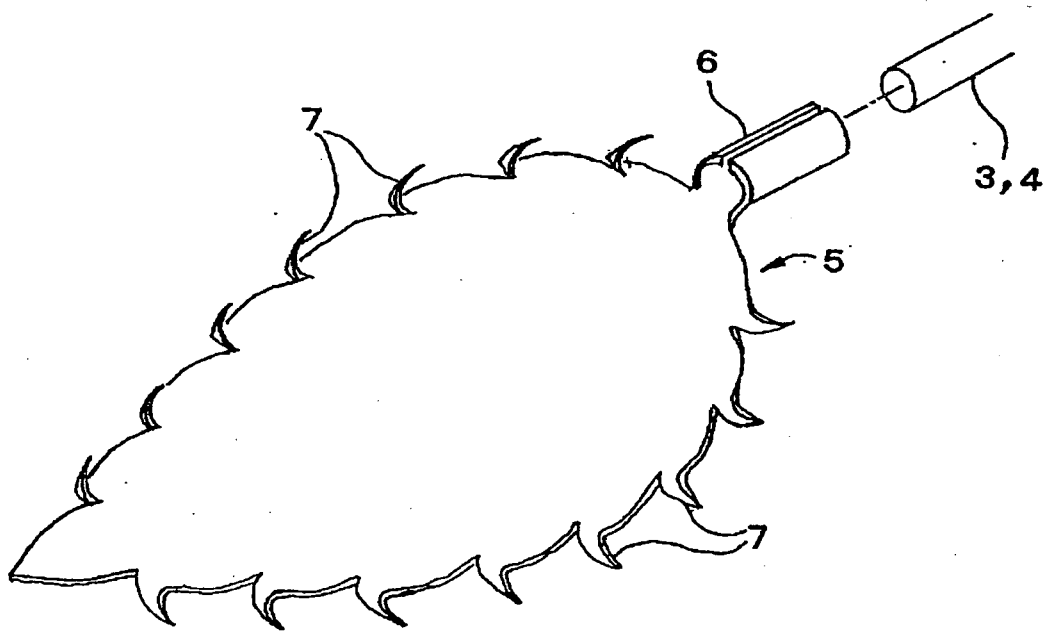


FIG. 3

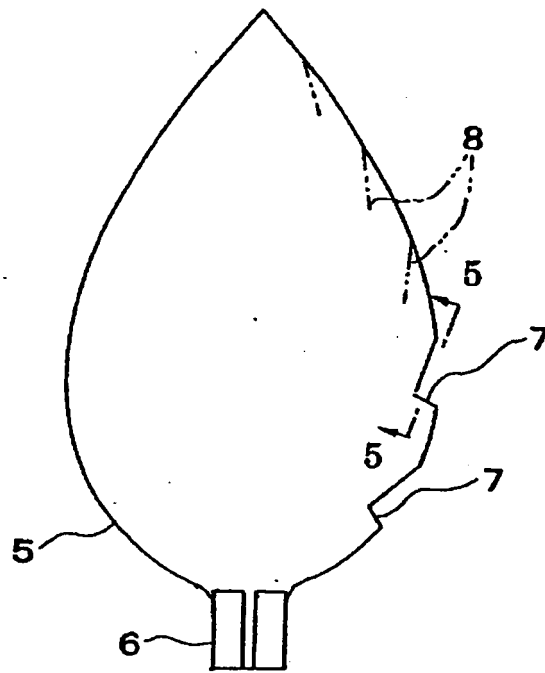


FIG. 4

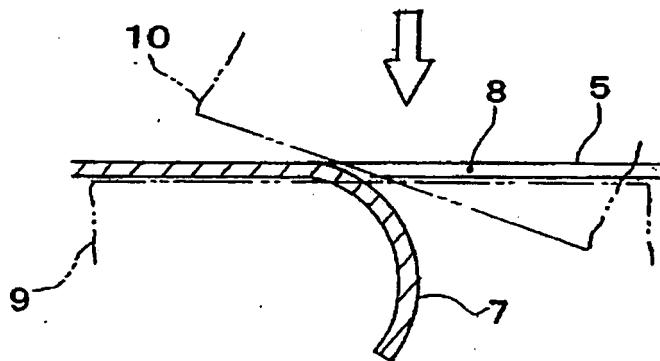


FIG. 5

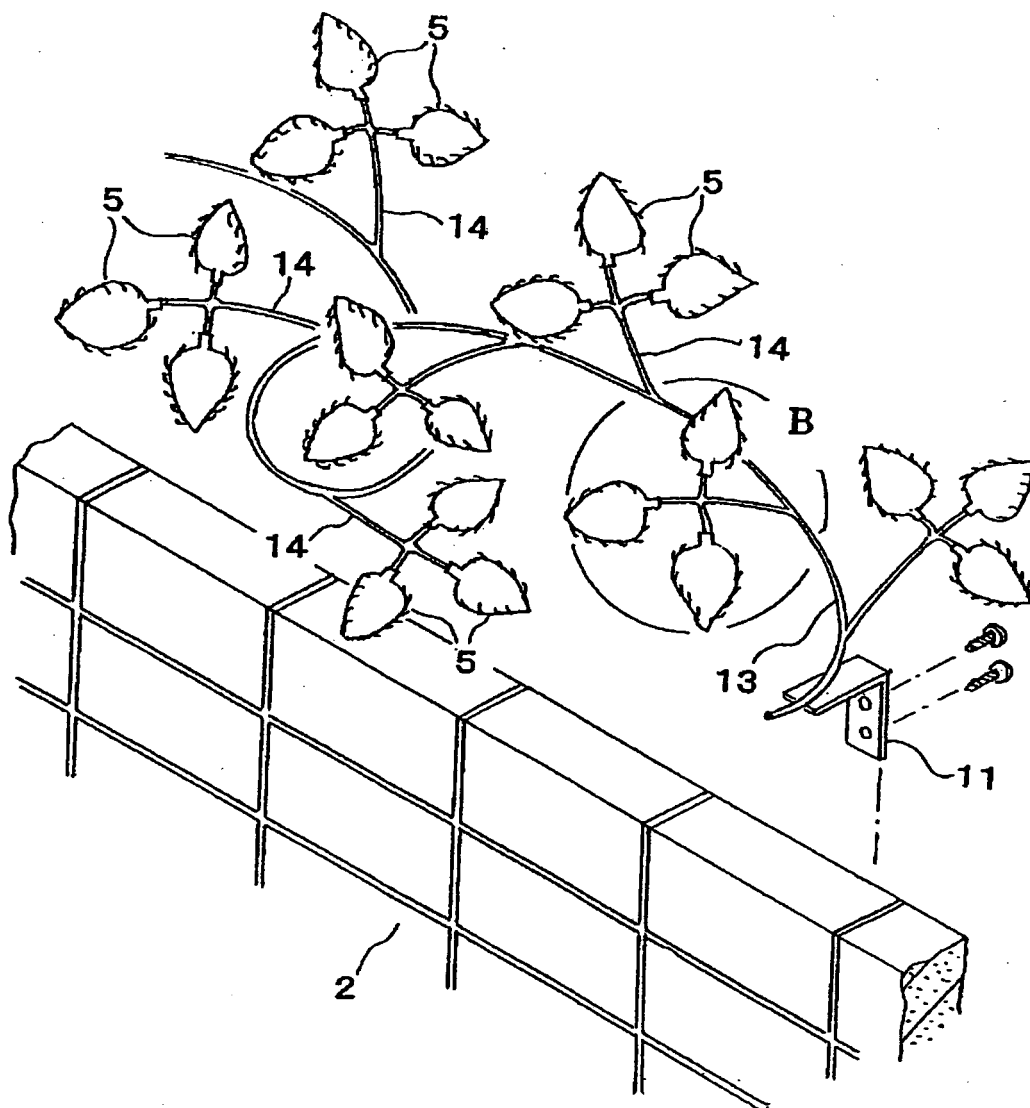


FIG. 6

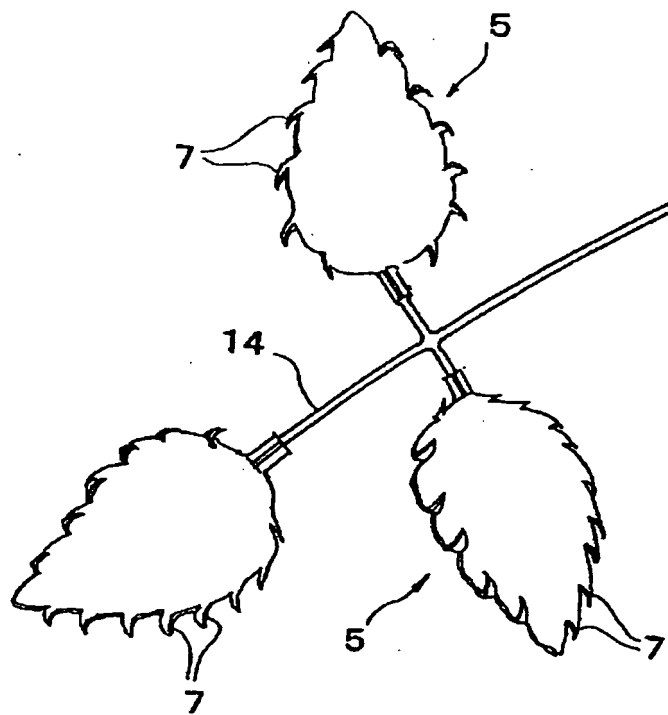


FIG. 7

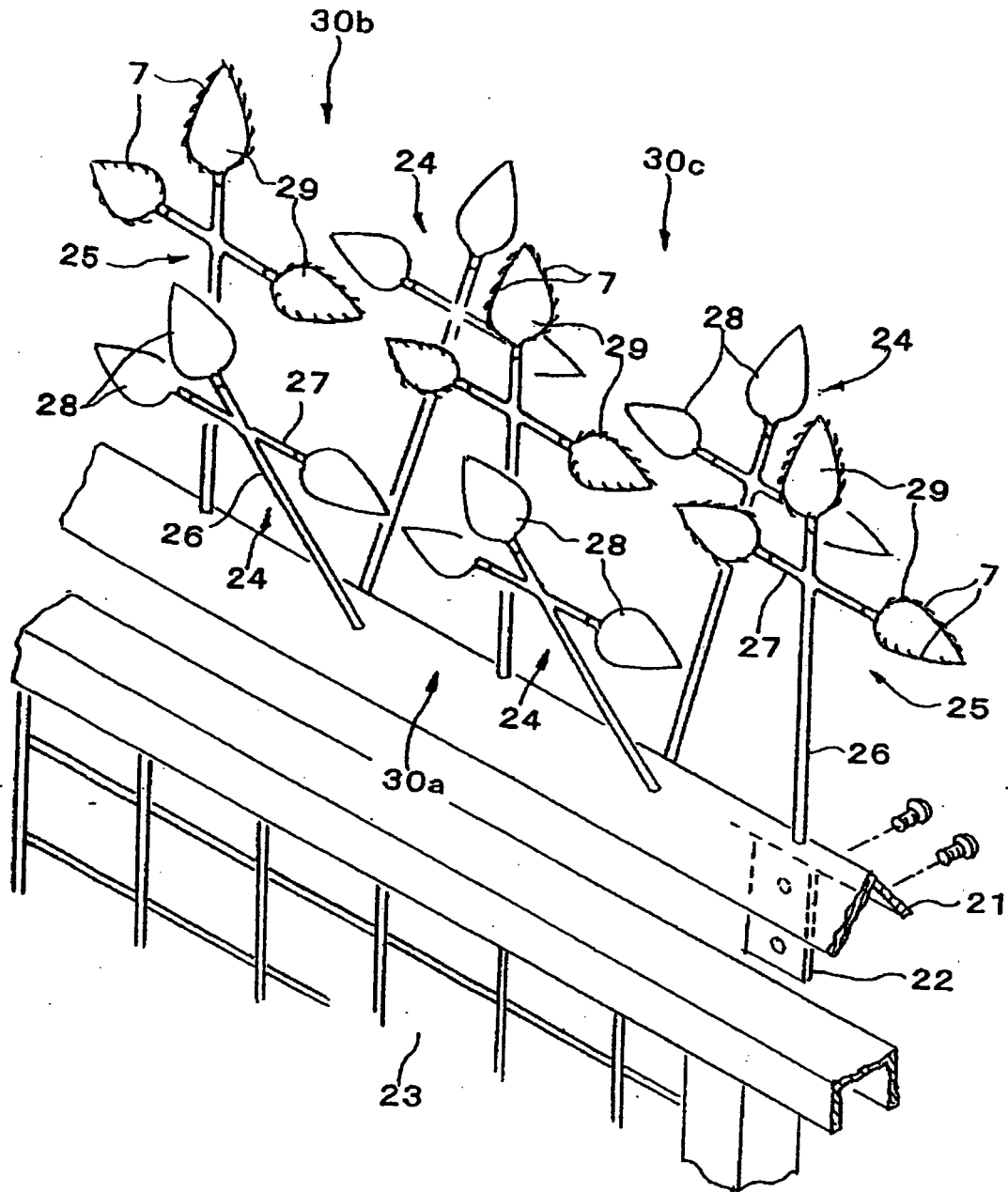


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/016417

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ E04H17/14

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)

Int.Cl⁷ E04H17/00-17/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2005

Kokai Jitsuyo Shinan Koho 1971-2005 Toroku Jitsuyo Shinan Koho 1994-2005

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 78756/1990 (Laid-open No. 37772/1992) (Shoei WATANABE), 30 March, 1992 (30.03.92), Full text; all drawings (Family: none)	1-5
A	JP 2003-184354 A (Shikoku Kasei Co., Ltd.), 03 July, 2003 (03.07.03), Full text; all drawings (Family: none)	1-5

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search
26 January, 2005 (26.01.05)Date of mailing of the international search report
15 February, 2005 (15.02.05)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2004)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2003020822 A [0010]
- JP 3042748 B [0010]
- JP H0620804 B [0010]
- JP H11256882 A [0010]