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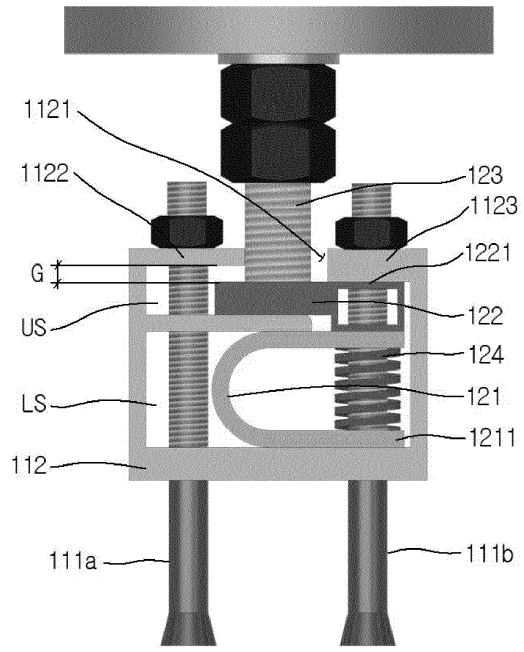
(54) ONE-WAY PIVOTING BOLLARD

(57) Disclosed is a one-way pivoting bollard, which includes: a bottom fixing unit (110) fixed to a ground surface by means of at least one anchor (111); a pillar disposed at an upper side of the bottom fixing unit to extend in a vertical direction; and a pivoting direction control unit (120) having one side coupled to the bottom fixing unit and the other side coupled to the pillar so that the pillar at the upper side of the bottom fixing unit is pivoted in one direction and restricted not to pivot in another direction, wherein the bottom fixing unit includes: a body (112) having an acceptable space formed therein and a cut portion (1121) formed at an upper surface thereof; and a barrier (113) horizontally coupled to the acceptable space of the body to form an open region at one side thereof so that the acceptable space is divided into an upper acceptable portion (US) and a lower acceptable portion (LS).

The one-way pivoting bollard may prevent a vehicle from entering the sidewalk by restricting pivoting of the pillar when an external force acts from the roadway toward the sidewalk and allows the pillar to pivot when an external force acts from the sidewalk toward the roadway, thereby prohibiting a shock not to be transmitted directly to the pedestrian.

【FIG.4】



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Description

[Technical Field]

[0001] The present disclosure relates to a one-way pivoting bollard, and more particularly, to a one-way pivoting bollard that is pivotable in one direction and restricts pivoting in another direction.

[Background Art]

[0002] Bollards are installed at a border portion between a roadway and a sidewalk at a narrower interval than a vehicle breadth to protect the pedestrian by preventing a vehicle from entering the sidewalk. The bollard may be installed as shown in FIG. 1.

[0003] In order to install the bollard as shown in FIG. 1, concrete is placed in a state where a bollard 1 is placed upright on a ground surface 2 dug to a certain depth, and the placed concrete is cured to firmly fix the bollard 1 to the ground surface.

[0004] However, if a vehicle collides with the bollard formed as described above, the load is directly transmitted to the ground surface where the concrete is placed, which may damage the concrete and the bollard. For this reason, it is disadvantageous in maintenance because the foundation construction and the bollard must be reinstalled.

[0005] In order to solve this problem, a lightweight stainless steel pipe or a high-strength elastic material having excellent shock absorption and excellent resilience is being used for the bollard. However, since the connection structure between the bollard and the ground is not changed, it is difficult to fundamentally solve the problem of FIG. 1.

[RELATED LITERATURES]

[Patent Literature]

[0006] Korean Utility Model Registration No. 20-0245923, October 15, 2001

[Disclosure]

[Technical Problem]

[0007] The present disclosure is directed to providing a one-way pivoting bollard, which may pivot in one direction and restrict pivoting in another direction.

[0008] The object of the present disclosure is not limited to the above, and other objects not mentioned can be clearly understood by those skilled in the art from the description below.

[Technical Solution]

[0009] In one aspect, there is provided a one-way pivoting bollard, comprising: a bottom fixing unit fixed to a ground surface by means of at least one anchor; a pillar disposed at an upper side of the bottom fixing unit to extend in a vertical direction; and a pivoting direction control unit having one side coupled to the bottom fixing unit and the other side coupled to the pillar so that the pillar at the upper side of the bottom fixing unit is pivoted in one direction and restricted not to pivot in another direction, wherein the bottom fixing unit includes: a body having an acceptable space formed therein and a cut portion formed at an upper surface thereof; and a barrier horizontally coupled to the acceptable space of the body to form an open region at one side thereof so that the acceptable space is divided into an upper acceptable portion and a lower acceptable portion.

[0010] Here, the pivoting direction control unit may include: an elastic portion having a '⊂' shape and disposed in the lower acceptable portion to close the open region formed through the barrier; a compression portion formed to have a stepped lower surface to be in contact with an upper surface of the barrier and an upper surface of the elastic portion and a flat upper surface, the compression portion being disposed in the upper acceptable portion to compress the elastic portion as the pillar is pivoted; and a pivotal shaft having one end coupled to the compression portion and the other end extending upward along the cut portion and coupled to the pillar.

[0011] Here, an outer circumference of one side of the pivotal shaft may be disposed to be in contact with one side surface of the cut portion to restrict pivoting toward the contact surface, and an outer circumference of the other side of the pivotal shaft may be spaced apart from the other side surface of the cut portion by a predetermined distance to allow pivoting of the pivotal shaft so that the pillar is pivoted.

[0012] Here, the pivoting direction control unit may further include at least one coil spring disposed in the '⊂'-shaped

elastic portion, and the anchor may be provided in the number of at least one at each of right and left sides relative to the cut portion to be coupled through the body in a vertical direction, and among the anchors disposed at the right and left sides, the anchor disposed at one side may protrude to an upper side of the body through the elastic portion, the compression portion and the coil spring disposed in the elastic portion and be fixed thereto.

[0013] Here, the upper surface of the body where the open region is formed based on the cut portion may be formed relatively thicker than the other side region of the body, and a gap may be formed between the upper surface of the compression portion and the other side region of the body due to the difference in thickness so that a pivoting angle of the pillar is set by means of the gap.

[0014] Here, at least one of the bottom fixing unit and the pillar may be made of aluminum.

[Advantageous Effects]

[0015] The one-way pivoting bollard according to the present disclosure may prevent a vehicle from entering the sidewalk by restricting pivoting of the pillar when an external force acts from the roadway toward the sidewalk and allows the pillar to pivot when an external force acts from the sidewalk toward the roadway, thereby prohibiting a shock not to be transmitted directly to the pedestrian.

[0016] The effect of the present disclosure is not limited to the above, and other effects not mentioned can be clearly understood by those skilled in the art from the description below.

[Description of Drawings]

[0017]

FIG. 1 is a diagram showing a conventional bollard.

FIG. 2 is a perspective view showing a one-way pivoting bollard according to an embodiment of the present disclosure.

FIG. 3 is a partial perspective view showing that a lower portion of the one-way pivoting bollard according to an embodiment of the present disclosure is opened.

FIG. 4 is a diagram, observed in the direction 'A' of FIG. 3.

FIG. 5 is a diagram showing a pillar of the one-way pivoting bollard according to an embodiment of the present disclosure from the above.

FIG. 6 is a concept view showing a state where the compression portion of the one-way pivoting bollard according to an embodiment of the present disclosure is pivoted.

[Best Mode]

[0018] Hereinafter, an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings. At this time, it should be noted that like components in the accompanying drawings are denoted by like reference signs as possible. In addition, any known functions and configurations that may obscure the essence of the present disclosure will not be explained. For the same reason, some components in the accompanying drawings are exaggerated, omitted or schematically shown.

[0019] In addition, throughout the specification, when any component is referred to as including another component, it means that the component can include other components further, instead of excluding other components, unless specifically stated otherwise. In addition, throughout the specification, the term "on ..." means to be located above or below a corresponding portion, and does not necessarily mean that the component is located at an upper side based on the gravitational direction.

[0020] FIG. 2 is a perspective view showing a one-way pivoting bollard according to an embodiment of the present disclosure, and FIG. 3 is a partial perspective view showing that a lower portion of the one-way pivoting bollard according to an embodiment of the present disclosure is opened.

[0021] Referring to FIGS. 2 and 3, a one-way pivoting bollard 10 according to an embodiment of the present disclosure includes a bottom fixing unit 110, a pivoting direction control unit 120 and a pillar 130.

[0022] The bottom fixing unit 110 is fixed to a ground surface by means of at least one anchor 111 and may include a body 112 and a barrier 113. The body 112 is formed in a box shape to form an acceptable space therein, and a cut portion 1121 is formed at an upper surface of the body 112. The cut portion 1121 is formed such that a pivotal shaft 123 coupled to a compression portion 122 may protrude out of the body 112. The cut portion 1121 is preferably formed larger than the diameter of the pivotal shaft 123 such that when the pivotal shaft 123 is pivoted in one direction, an inner circumference of the cut portion 1121 comes into contact with an outer circumference of the pivotal shaft 123 to restrict pivoting. In FIG. 3, the cut portion 1121 is shown to be long along the longitudinal direction only to express an internal coupling state of the body 110. The cut portion 1121 is preferably formed in a substantially circular shape as shown in

the perspective view of FIG. 2.

[0023] The barrier 113 is horizontally coupled to form an open region OS at one side of the acceptable space of the body 110 to divide the acceptable space into an upper acceptable portion US and a lower acceptable portion LS. The barrier 113 may be integrally formed with the body 110. The upper acceptable portion US and the lower acceptable portion LS are configured to communicate with each other before the pivoting direction control unit 120 is disposed. The body 110 may be made of aluminum. The body 110 made of aluminum is prevented from being corroded without additional anticorrosive treatment when buried in the ground, so that no additional management for maintenance is required.

[0024] The pivoting direction control unit 120 has one side coupled to the bottom fixing unit 110 and the other side coupled to the pillar 130 so that the pillar 130 is pivoted in one direction above the bottom fixing unit 110 and is restricted to pivot in another direction. That is, the pivoting direction control unit 120 restricts the pivoting direction of the pillar 130 according to the installation direction to limit the entry of a vehicle or allows the pillar 130 to pivot against an external force applied by the pedestrian at the sidewalk in order to minimize the amount of shock transferred to the pedestrian.

[0025] The pillar 130 is disposed to extend in the vertical direction at the upper side of the bottom fixing unit 110.

[0026] Hereinafter, each component will be described in more detail.

[0027] FIG. 4 is a diagram, observed in the direction 'A' of FIG. 3. The pivoting direction control unit 120 and the bottom fixing unit 110 of the one-way pivoting bollard according to an embodiment of the present disclosure will be described in more detail with reference to FIG. 4.

[0028] The pivoting direction control unit 120 includes an elastic portion 121, a compression portion 122, a pivotal shaft 123 and a coil spring 124. The elastic portion 121 is formed to have a substantially '⊂' shape and is disposed in the lower acceptable portion LS to close the open region OS formed through the barrier 113. At this time, both open ends 1211 of the elastic portion 121 are coupled by means of the anchor 111.

[0029] The compression portion 122 has a stepped lower surface to be in contact with an upper surface of the barrier 113 and an upper surface of the elastic portion 121 and an upper surface formed flat and is disposed in the upper acceptable portion US. One end 1221 of the compression portion 122 is also coupled to the anchor 111, and for this purpose, a hole is formed therein along the coupling direction. The hole may be formed in a slot shape so that the movement is not limited by the anchor 111 when the compression portion 122 pivots.

[0030] If the pillar 130 is pivoted due to an external force, the compression portion 122 rotates. While rotating as shown in FIG. 6, the pivotal shaft 123 pivots as shown in FIG. 6 so that one end of the compression portion 122 is moved downward to press one side surface of the compression portion 122 and the other end of the compression portion 122 is moved upward to allow the pillar 130 to displace in one direction.

[0031] At this time, in order for the other end of the compression portion 122 to move upward, the thickness 1122 of the upper surface of the body 110 is formed different at right and left sides relative to the cut portion 1121. Here, the left region 1122 is formed to have a relatively smaller thickness compared with the right region to form a gap G to the upper surface of the compression portion 122, and the right region 1123 is formed to contact the upper surface of the compression portion 122. Thus, the compression portion 122 may pivot in one direction through the gap G, and the other side is in close contact to restrict pivoting in another direction.

[0032] In addition, the cut portion 1121 is formed larger than the diameter of the pivotal shaft 123, and thus one side surface of the outer circumference of the pivotal shaft 123 is spaced apart from one side surface of the cut portion 1121 by a predetermined distance to allow the pivotal shaft 123 to pivot through the gap G with the upper surface of the compression portion 122 so that the pillar 130 may pivot. The other side of the outer circumference of the pivotal shaft 123 is disposed to be in contact with one side surface of the cut portion 1121 and in contact with the upper surface of the compression portion 122 to restrict pivoting toward the contact surface.

[0033] The pivotal shaft 123 has one end coupled to the compression portion 122 and the other end extending upward through the cut portion 1121 and coupled to the pillar 130. The pivotal shaft 123 may have a thread formed on the outer circumference thereof, and the height of the pillar may be variably adjusted by means of a nut coupled to the thread.

[0034] The coil spring 124 is disposed at the inner side of the elastic portion 121 having a '⊂' shape and is disposed to surround the anchor 111 penetrating through one end of the elastic portion 121 in the circumferential direction. The coil spring 124 allows the elastic portion 121 to be restored more quickly, so that the inclined pillar 130 may restore to the original position fast.

[0035] At this time, among the plurality of anchors 111, the anchor 111a located at the left side is connected to the body 110, and the anchor 111b located at the right side protrudes to an upper side of the body through the compression spring 122, the elastic portion 121 and the coil spring 124 disposed in the elastic portion 121 and may be fixed thereto. The anchor 111b may fix the positions of the compression portion 122, the elastic portion 121 and the coil spring 124 disposed in the upper acceptable portion US and the lower acceptable portion LS of the body 110.

[0036] FIG. 5 is a diagram showing a pillar of the one-way pivoting bollard according to an embodiment of the present disclosure from the above.

[0037] The pillar 130 may have a shell housing 131 and a shock absorbing portion 132. The shell housing 131 has a cylindrical shape to form the acceptable space therein. The shock absorbing portion 132 is provided in plural and disposed

in a radial direction toward the inner circumference of the shell housing 131 based on the pivotal shaft 123. The shell housing 131 may have a fitting portion 1311 formed on the inner circumference at a surface in contact with the shock absorbing portion 132, and the shock absorbing portion 132 may have a protrusion 1321 formed to be coupled to the fitting portion 1311. In the present disclosure, since the coupling is made through a cap (not shown) at the top of the pillar 130, it is possible to prevent the shell housing 131 from being separated along the longitudinal direction.

[0038] The pillar 130 may be made of aluminum. The pillar 130 made of aluminum may prevent corrosion without additional anticorrosive treatment. Also, when the shock is applied, the pillar 130 may absorb the deformation to prevent the impact from being transferred to a lower base part, thereby preventing the base part of the pillar from being broken.

[0039] FIG. 6 is a concept view showing a state where the compression portion of the one-way pivoting bollard according to an embodiment of the present disclosure is pivoted.

[0040] Assuming that the left side is the sidewalk and the right side is the roadway based on FIG. 6, if a vehicle tries to enter from the roadway toward the sidewalk, since the upper surface of the compression portion 122 is in close contact with the upper surface of the body 110, it is possible to prevent the vehicle from entering the sidewalk from the roadway.

[0041] Meanwhile, if a person pushes the bollard at the sidewalk, the compression portion 123 pivots while compressing the elastic portion 121 due to the predetermined distance formed between the upper surface of the compression portion 123 and the upper surface of the body 110, thereby allowing the pillar to pivot. Thus, when the person hits the pillar, the pillar is deformed at a predetermined angle to minimize the transfer of the shock to the person, thereby preventing the person from being injured.

[0042] Meanwhile, it should be understood that the present disclosure is not intended to limit the scope of the present disclosure, but it is intended merely to easily explain the technique of the present disclosure and to propose specific examples for aiding understanding of the present disclosure. It should be apparent to those skilled in the art that there are many modifications based on the technical idea of the present disclosure other than the embodiments disclosed herein.

[Reference Signs]

110: bottom fixing unit	111: anchor
112: body	113: barrier
120: pivoting direction control unit	121: elastic portion
122: compression portion	123: pivotal shaft
124: coil spring	130: pillar
131: shell housing	132: shock absorbing portion

Claims

1. A one-way pivoting bollard, comprising:

a bottom fixing unit fixed to a ground surface by means of at least one anchor;
a pillar disposed at an upper side of the bottom fixing unit to extend in a vertical direction; and
a pivoting direction control unit having one side coupled to the bottom fixing unit and the other side coupled to the pillar so that the pillar at the upper side of the bottom fixing unit is pivoted in one direction and restricted not to pivot in another direction,
wherein the bottom fixing unit includes:

a body having an acceptable space formed therein and a cut portion formed at an upper surface thereof; and
a barrier horizontally coupled to the acceptable space of the body to form an open region at one side thereof so that the acceptable space is divided into an upper acceptable portion and a lower acceptable portion.

2. The one-way pivoting bollard according to claim 1,
wherein the pivoting direction control unit includes:

an elastic portion having a '⊂' shape and disposed in the lower acceptable portion to close the open region formed through the barrier;
a compression portion formed to have a stepped lower surface to be in contact with an upper surface of the barrier and an upper surface of the elastic portion and a flat upper surface, the compression portion being disposed in the upper acceptable portion to compress the elastic portion as the pillar is pivoted; and
a pivotal shaft having one end coupled to the compression portion and the other end extending upward along

the cut portion and coupled to the pillar.

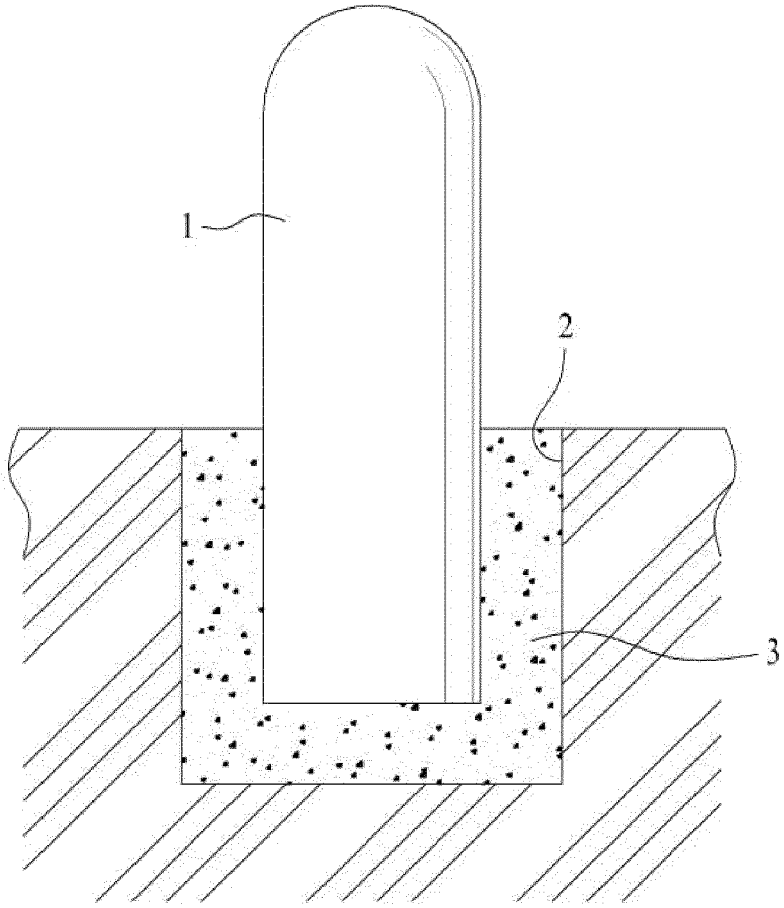
3. The one-way pivoting bollard according to claim 2,
wherein an outer circumference of one side of the pivotal shaft is disposed to be in contact with one side surface of the cut portion to restrict pivoting toward the contact surface, and an outer circumference of the other side of the pivotal shaft is spaced apart from the other side surface of the cut portion by a predetermined distance to allow pivoting of the pivotal shaft so that the pillar is pivoted.

4. The one-way pivoting bollard according to claim 2,
wherein the pivoting direction control unit further includes at least one coil spring disposed in the '⊂'-shaped elastic portion, and
wherein the anchor is provided in the number of at least one at each of right and left sides relative to the cut portion to be coupled through the body in a vertical direction, and among the anchors disposed at the right and left sides, the anchor disposed at one side protrudes to an upper side of the body through the elastic portion, the compression portion and the coil spring disposed in the elastic portion and is fixed thereto.

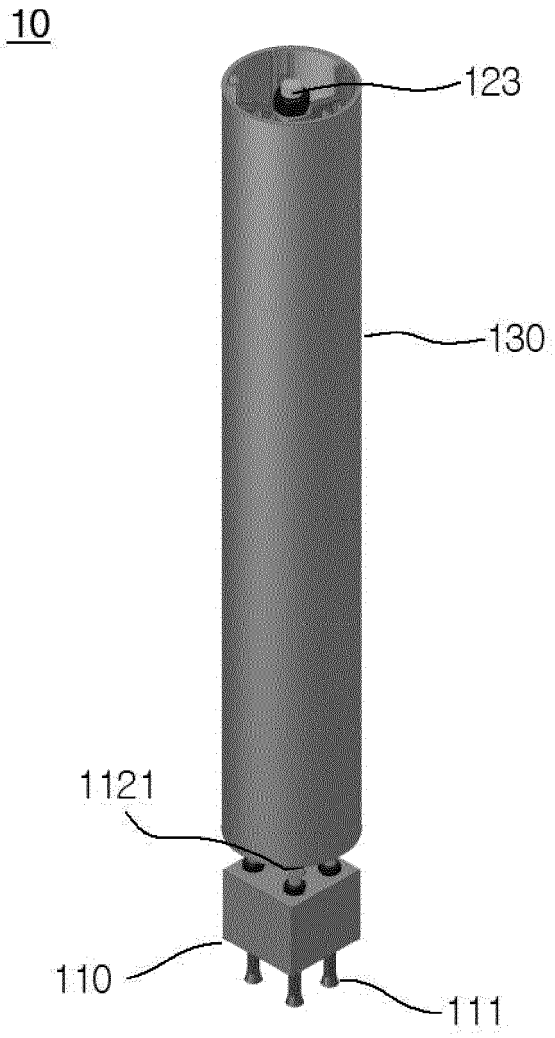
5. The one-way pivoting bollard according to claim 2,
wherein the upper surface of the body where the open region is formed based on the cut portion is formed relatively thicker than the other side region of the body, and a gap is formed between the upper surface of the compression portion and the other side region of the body due to the difference in thickness so that a pivoting angle of the pillar is set by means of the gap.

6. The one-way pivoting bollard according to claim 1,
wherein at least one of the bottom fixing unit and the pillar is made of aluminum.

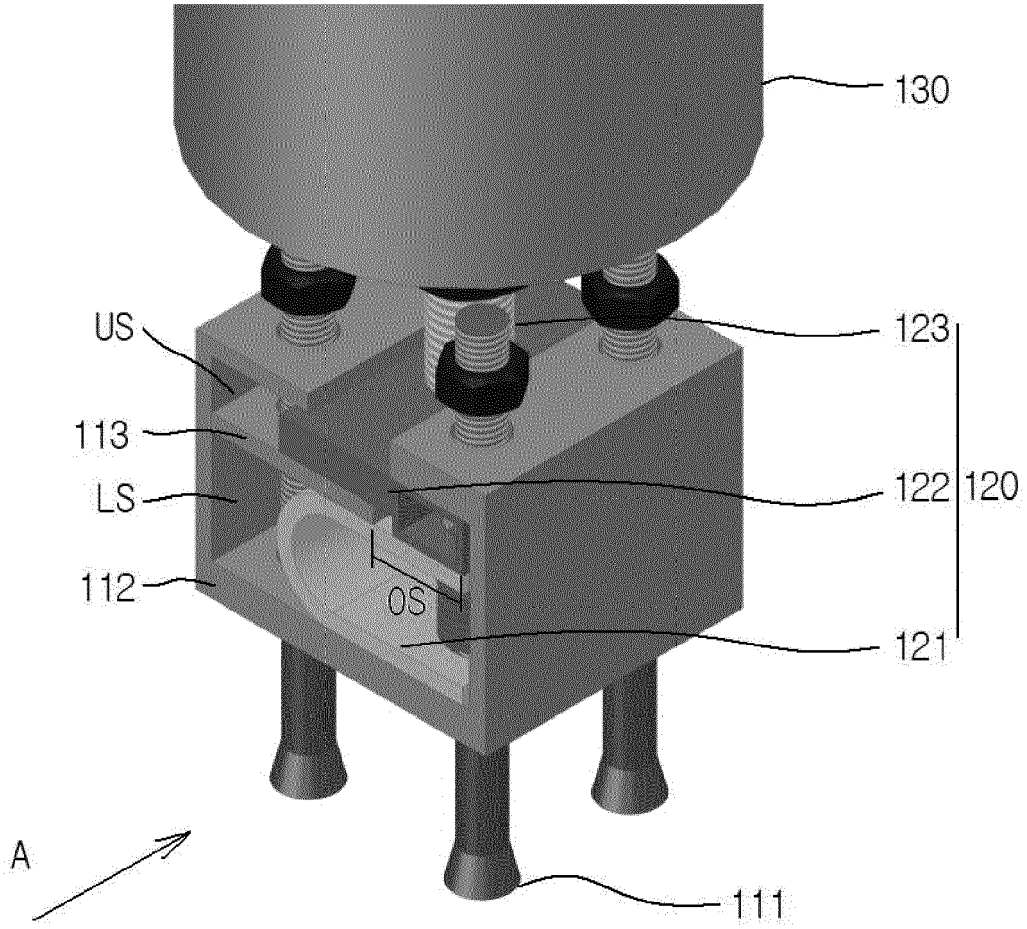
【FIG.1】



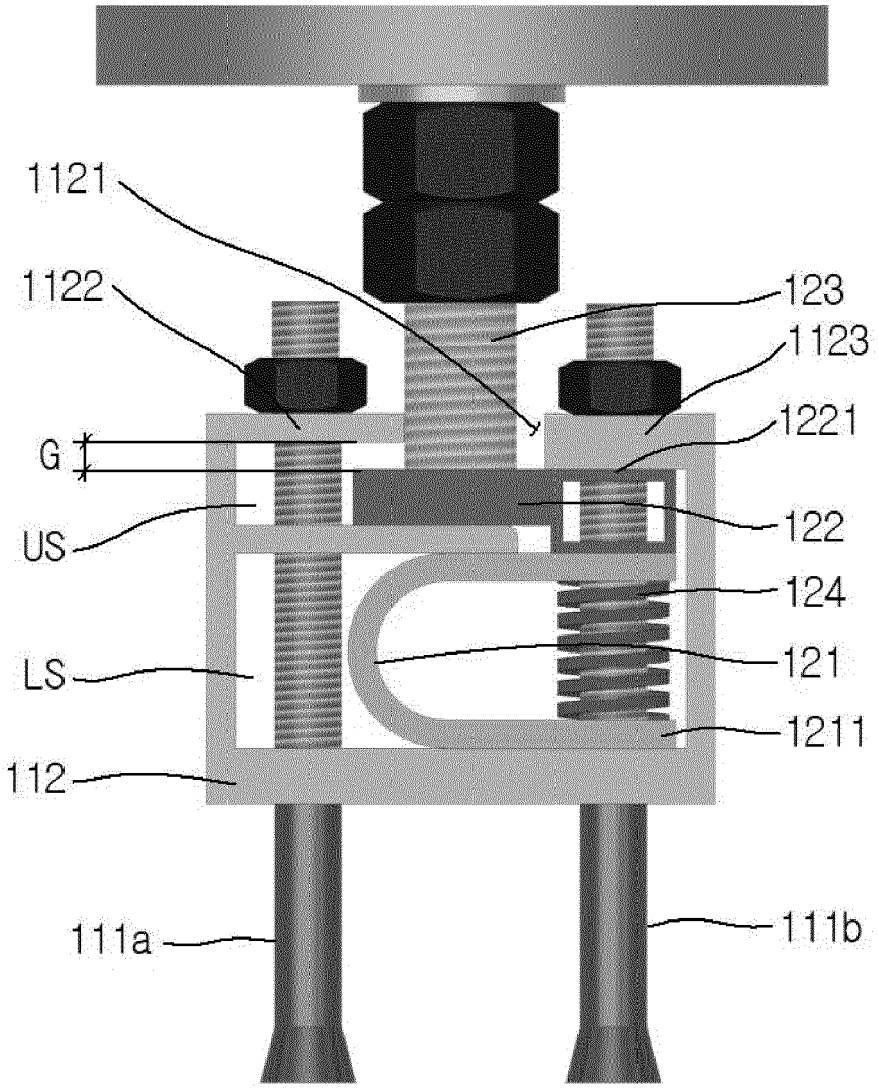
【FIG. 2】



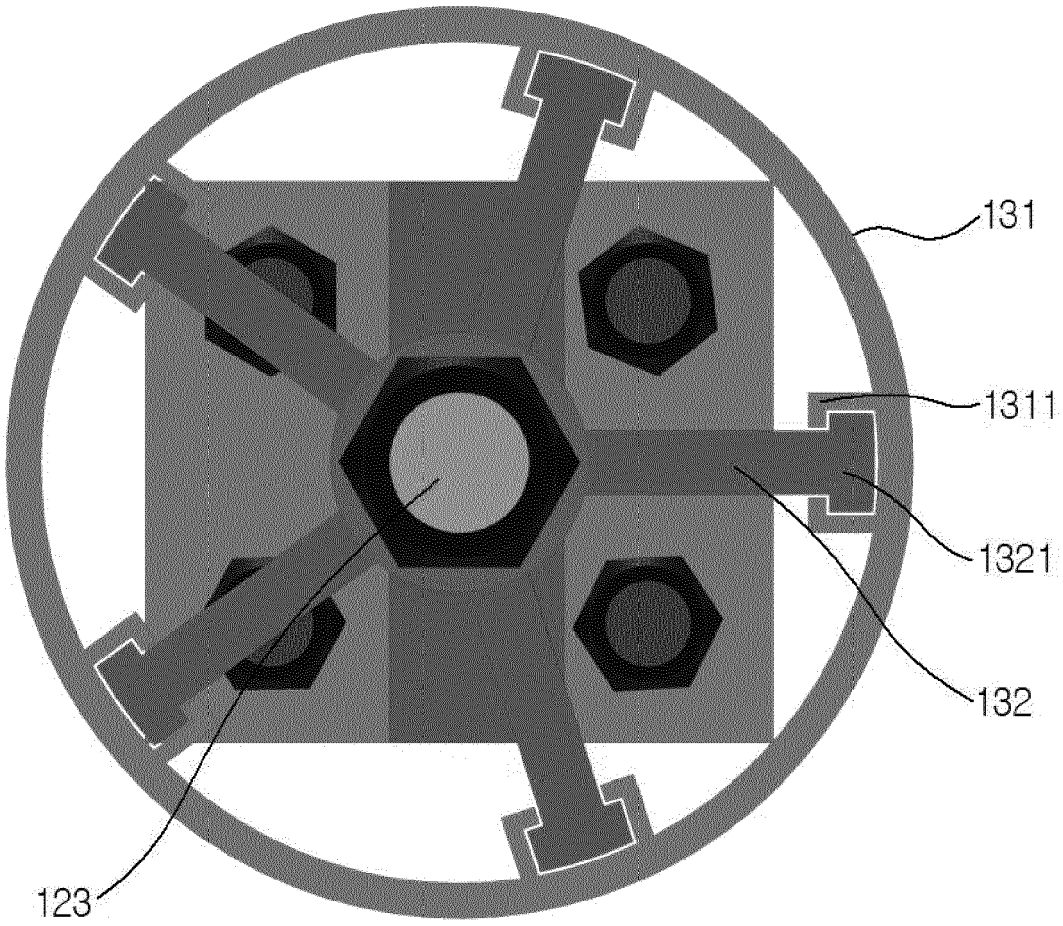
【FIG.3】



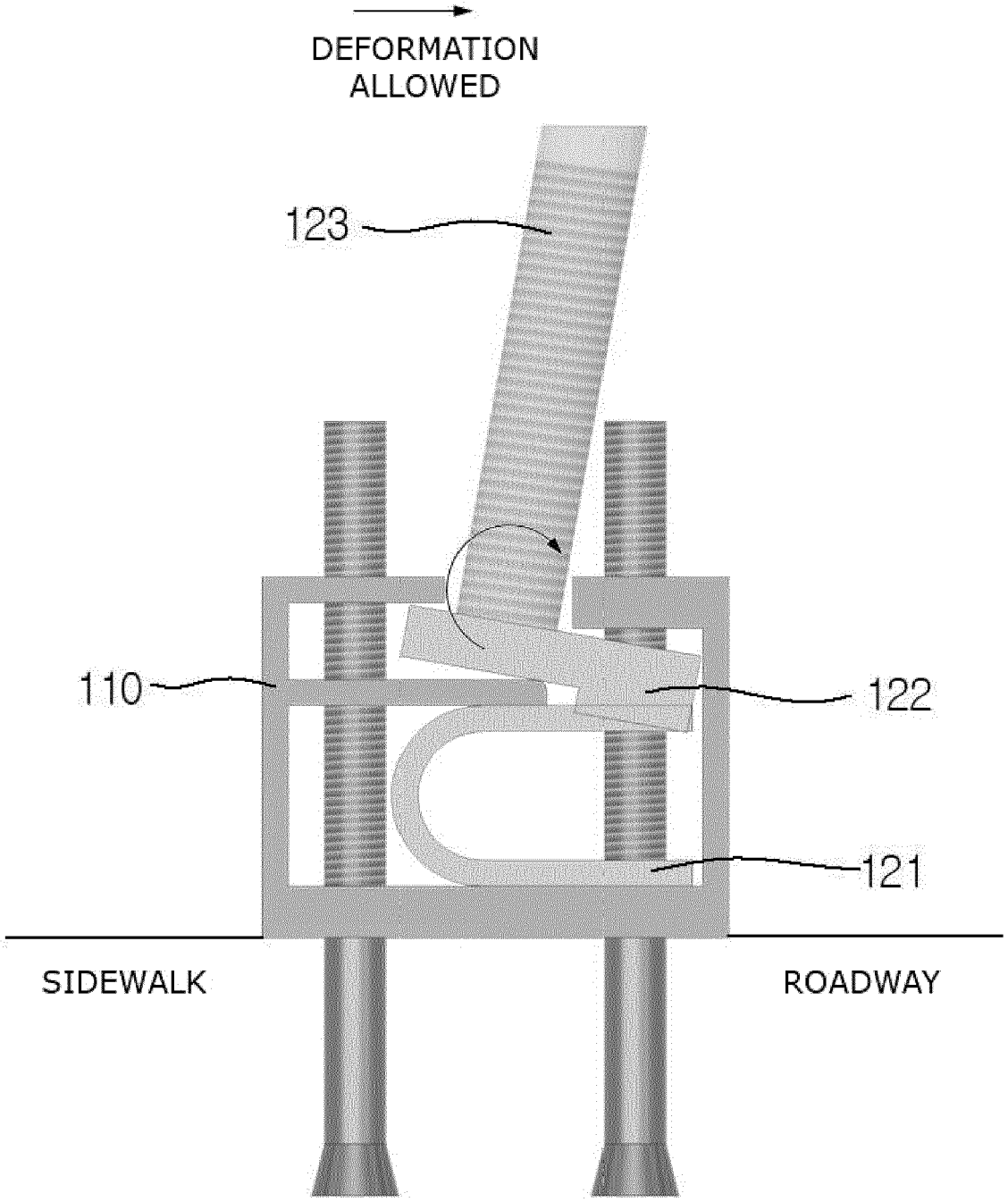
【FIG.4】



【FIG. 5】



【FIG. 6】



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EUROPEAN SEARCH REPORT

Application Number
EP 19 20 1412

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 2 267 225 A1 (WOLTERS GERARD [BE]) 29 December 2010 (2010-12-29) * paragraph [0010]; figures 1-4, 12 *	1-6	INV. E01F9/627
A	EP 0 571 082 A1 (AVON POLYMER PROD LTD [GB]) 24 November 1993 (1993-11-24) * column 4, lines 3-44 * * column 5, lines 25-29, 54-58; figures 1,2,5 *	1-6	
A	KR 2000 0020872 U (N N [KR]) 15 December 2000 (2000-12-15) * abstract; figure 3 *	1	

TECHNICAL FIELDS SEARCHED (IPC)
E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	27 March 2020	Flores Hokkanen, P

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 20 1412

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
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27-03-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2267225 A1	29-12-2010	BE 1018316 A3	03-08-2010
		EP 2267225 A1	29-12-2010
		ES 2396193 T3	19-02-2013
EP 0571082 A1	24-11-1993	NONE	
KR 20000020872 U	15-12-2000	NONE	

EPO FORM P0459

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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Patent documents cited in the description

- KR 200245923 **[0006]**