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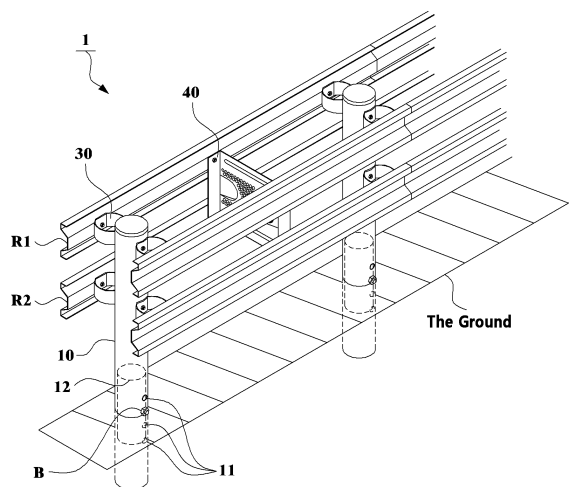
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(54) **GUARDRAIL FOR VEHICLE**

(57) The present invention relates to a road safety barrier for a vehicle including: a plurality of posts disposed at a given distance to each other; a pair of upper rails disposed horizontally on both sides of the posts; a pair of lower rails disposed horizontally on both sides of the posts in such a manner as to be spaced apart from the pair of upper rails by a given distance under the pair of

upper rails; shock absorbing members disposed between the posts and the pair of upper rails and between the posts and the pair of lower rails to form given gaps therebetween; and rail reinforcing plates fixed to the pair of upper rails and the pair of lower rails and having at least one or more through holes formed thereon.

FIG.1



Description

[Technical Field]

[0001] The present invention relates to a road safety barrier for a vehicle, and more particularly, to a road safety barrier for a vehicle that is capable of reinforcing the strength of upper rails and lower rails, rigidly maintaining the space between the upper rails and the lower rails upon the occurrence of the collision with a vehicle, while being not much open, achieving good visibility through reflection sheets, and allowing posts to be inclined when an external force like collision with a vehicle is applied thereto and to be then returned to its original shape by means of its elastic force.

[Background Art]

[0002] Generally, road safety barriers for vehicles are installed along a center line of a road, that is, along a yellow solid center line defining the driving width of the vehicles, so as to strictly divide the lanes of the driven vehicles facing each other and to suppress the invasion of the vehicles driven on one side lane into the opposite lane to one side lane, thus previously preventing large-scale collision accidents among the vehicles. Otherwise, the road safety barriers are installed along the sides of roads or along the edges of bridges, thus preventing the vehicles driven on the roads or bridges from being deviated from the roads or bridges.

[0003] The road safety barrier generally includes a plurality of posts installed vertically at a given distance to each other along the center of a road or along the side of a road and rails connecting the posts with each other in a horizontal direction.

[0004] The road safety barrier disposed along the center of the road has pairs of upper and lower rails spaced apart from each other on both sides of the posts, but the road safety barrier disposed along the side of the road has the rails disposed only along one side of the posts.

[0005] So as to protect all kinds of vehicles including low-height bodies as well as high-height bodies from various accidents, further, the rails are disposed on the upper and lower portions of the posts, while being spaced apart from each other by a given distance.

[0006] By the way, the conventional road safety barrier is configured wherein the rails are coupled only to the posts, and accordingly, if a vehicle collides with the space between the posts, the upper rails and the lower rails are open up and down, thus often failing to perform their function as the safety barrier. Particularly, in case of the road safety barrier disposed along the side of the road, the rails are installed only on one side of the posts, and accordingly, if a vehicle collides with the road safety barrier, the upper rail and the lower rail are open from each other, so that the lower rail serves as a footstep on which the wheel of the vehicle is placed, thus causing the vehicle to be escaped from the road safety barrier to provide

large-scale accidents.

[0007] So as to solve the above-mentioned problems, accordingly, many studies have been made to reinforce the strength of the rails. For example, reinforcing plates are located between the rails so as to reinforce the strength of the rails. Although many suggestions have been tried, however, the deviation of vehicles from the road safety barriers upon the occurrence of collision with the vehicles cannot be completely prevented. Besides, the reinforcing plates are weak to the resistance of strong wind, thus making the whole road safety barrier undesirably damaged or broken.

[Disclosure]

[Technical Problem]

[0008] Accordingly, the present invention has been made in view of the above-mentioned problems occurring in the prior art, and it is an object of the present invention to provide a road safety barrier for a vehicle that is capable of reinforcing the strength of upper rails and lower rails, rigidly maintaining the space between the upper rails and the lower rails upon the occurrence of the collision with a vehicle, while being not much open, achieving good visibility through reflection sheets, and allowing posts to be inclined when an external force like collision with a vehicle is applied thereto and to be then returned to its original shape by means of its elastic force.

[Technical Solution]

[0009] To accomplish the above-mentioned object, according to the present invention, there is provided a road safety barrier for a vehicle including: a plurality of posts disposed at a given distance to each other; a pair of upper rails disposed horizontally on both sides of the posts; a pair of lower rails disposed horizontally on both sides of the posts in such a manner as to be spaced apart from the pair of upper rails by a given distance under the pair of upper rails; shock absorbing members disposed between the posts and the pair of upper rails and between the posts and the pair of lower rails to form given gaps therebetween; and rail reinforcing plates fixed to the pair of upper rails and the pair of lower rails and having at least one or more through holes formed thereon.

[0010] According to the present invention, preferably, each rail reinforcing plate further includes reflection sheets attached to the exposed surfaces on the space formed between the pair of upper rails and the pair of lower rails.

[0011] According to the present invention, preferably, each rail reinforcing plate is formed perpendicular to the pair of upper rails or the pair of lower rails, and the surfaces to which the reflection sheets are attached become more protruded as the surfaces go toward the inside.

[0012] According to the present invention, preferably, each rail reinforcing plate is slantly formed with respect

to the pair of upper rails or the pair of lower rails.

[0013] According to the present invention, preferably, each shock absorbing member has a shape of a hollow post, and the plane shape of the shock absorbing member has a closed curve.

[0014] According to the present invention, preferably, the road safety barrier for a vehicle further includes a reinforcing post located in the hollow interior of each post over the region which is bounded above the ground and under the ground, and the reinforcing post is shorter in length than the post.

[0015] According to the present invention, preferably, the post and the reinforcing post have fastening holes formed thereon in such a manner as to be fixed to each other by means of fastening means, and the fastening holes are formed plurally on the post or the reinforcing post in up and down directions thereof.

[0016] According to the present invention, preferably, the road safety barrier for a vehicle further includes: bases fixed to the ground or a base structure; lower posts located on the bases and having top portions on which the posts are placed; a spring embedded in each post; a spring operating plate located on top of the spring; and a wire connected to the spring operating plate on the upper end thereof and fixed to each base on the lower end thereof in such a manner as to be passed through the spring.

[0017] According to the present invention, preferably, each lower post has a convex portion formed on the top surface thereof to guide the post so that the post is returned to the original position thereof by means of the elastic force thereof.

[0018] According to the present invention, preferably, the convex portion is inserted into the lower side of the post.

[0019] According to the present invention, preferably, a spring holder is located between the convex portion and the spring.

[0020] According to the present invention, preferably, the lower post is located on the base, without being fixed to the base.

[Advantageous Effects]

[0021] According to the present invention, the road safety barrier for a vehicle forms the given distance between the upper rails and the lower rails, thus improving the visibility thereof.

[0022] Further, the rail reinforcing plates are located between the upper rails and the lower rails disposed on both sides of the posts, thus reinforcing the strength of the rails and rigidly maintaining the space between the upper rails and the lower rails upon the occurrence of the collision with a vehicle, while being not much open.

[0023] Furthermore, the through holes are formed on the rail reinforcing plates to pass air therethrough, thus minimizing the influences caused by wind.

[0024] Also, upon the occurrence of the collision with

a vehicle, the rail reinforcing plates are deformed to absorb the shocks applied thereto.

[0025] Additionally, the rail reinforcing plates have the reflection sheets attached to the surfaces where good visibility are obtained in the advancing direction of the vehicle, thus guiding the driver of the vehicle.

[0026] Moreover, the hollow shock absorbing members are located between the posts and the rails in such a manner as to be deformed to absorb the shocks applied thereto upon the occurrence of the collision with a vehicle.

[0027] Further, if an external force like collision with a vehicle occurs, each post is inclined and then returned to its original shape by means of its elastic force.

[Description of Drawings]

[0028]

FIG.1 is a perspective view showing a road safety barrier for a vehicle according to a first embodiment of the present invention.

FIGS.2 to 4c are views showing the parts of the road safety barrier for a vehicle according to the first embodiment of the present invention.

FIG.5 to 7 are views showing a road safety barrier for a vehicle according to a second embodiment of the present invention.

[Mode for Invention]

[0029] Hereinafter, an explanation on a road safety barrier for a vehicle according to preferred embodiments of the present invention will be in detail given with reference to the attached drawings.

[0030] Referring to FIG.1, a road safety barrier for a vehicle according to a first embodiment of the present invention includes a plurality of posts 10, upper rails R1, lower rails R2, rail reinforcing plates 40, shock absorbing members 30, and reinforcing posts 12.

[0031] The upper rails R1 and the lower rails R2 are provided in pairs, while being arranged horizontally with respect to both sides of the posts 10, and then screw-coupled to the posts 10. Particularly, the upper rails R1 and the lower rails R2 are spaced apart from each other in up and down directions.

[0032] The shock absorbing members 30 are disposed between the posts 10 and the upper rail R1 and between the posts 10 and the lower rail R2 to form given gaps therebetween. When a vehicle collides with the road safety barrier for a vehicle, accordingly, the shock absorbing members 30 are deformed to absorb the shocks occurring upon the collision.

[0033] The reinforcing posts 12 serve to reinforce the bending strength of the posts 10 to prevent the posts 10 from being easily bent upon the occurrence of the collision with a vehicle. The reinforcing posts 12 are located inside the posts 10 each having a hollow portion formed therein, while being shorter in length than the posts 10.

Particularly, it is important that the reinforcing posts 12 are fixedly located over the region which is bounded above the ground and under the ground. Accordingly, the positions for fixing the reinforcing posts 12 should be determined upon the installing conditions and the circumstances of the construction sites. According to the first embodiment of the present invention, in this case, each reinforcing post 12 has one fastening hole, and each post 10 has a plurality of fastening holes 11 formed thereon in up and down directions. Accordingly, any one of the fastening holes 11 of the post 10 is selected in accordance with the installation heights of the post 10 and fixedly fastened to the fastening hole formed on the reinforcing post 12 by means of fastening means like a bolt B.

[0034] Each rail reinforcing plate 40 is coupled to the pair of upper rails R1 and the pair of lower rails R2 on both sides thereof to reinforce the strength of the rails. That is, the rail reinforcing plate 40 connects the upper rails R1 and the lower rails R2 to each other, so that even upon the occurrence of collision with a vehicle, the space between the upper rails R1 and the pair of lower rails R2 is rigidly maintained, without being much open, thus preventing the vehicle from being escaped from the road safety barrier and further allowing the shocks caused by the collision to be absorbed through the deformation of the rail reinforcing plates 40.

[0035] Referring to FIG.2, each rail reinforcing plate 40 includes a front surface portion 41 formed of a square metal plate, through holes 42 of given lengths formed horizontally on the upper and lower portions of the front surface portion 41, and a plurality of circular through holes 43 having small diameters formed in the middle portion of the front surface portion 41. Air is ventilated through the through holes 42 and 43, thus minimizing the influences caused by wind.

[0036] Further, each rail reinforcing plate 40 includes reflection sheets S attached to the opposite surfaces to each other on both sides thereof, so that when the rail reinforcing plates 40 are installed along the center of a road, they guide the vehicles running in left and right sides of the road to the shape of the road. Particularly, the reflection sheets S are attached to the exposed surfaces by vehicle drivers on the space between the upper rails R1 and the lower rails R2.

[0037] FIGS.3a and 3b show various examples of the rail reinforcing plate 40, wherein a pair of fastening portions 46 are bent to the opposite directions to each other from both sides of the front surface portion 41 in such a manner as to be fastened to the upper rails R1 and the lower rails R2.

[0038] As shown in FIG.3a, first, a rail reinforcing plate 40A has the front surface portion 41 located perpendicular to the upper rails R1 or the lower rails R2, and in this case, the surfaces 44 and 45 to which the reflection sheets S are attached become more protruded as they go toward the inside. Like this, the reflection sheets S are attached to the slantly protruding surfaces 44 and 45, thus remarkably improving the visibility thereof.

[0039] As shown in FIG.3b, next, a rail reinforcing plate 40B has the front surface portion 41 located slantly with respect to the upper rails R1 or the lower rails R2, and in this case, since the front surface portion 41 of the rail reinforcing plate 40B is slantly formed, the visibility of the rail reinforcing plate 40B can be improved, without having any separate process of allowing the surfaces 44 and 45 to which the reflection sheets S are attached to be slantly protruded.

[0040] As shown in FIGS.4a to 4c, the shock absorbing members 30A to 30C have circular or polygonal shapes, and accordingly, their plane shapes have closed curves. However, the shock absorbing members 30A to 30C have rounded grooves 31 formed on one side surface thereof in such a manner as to be brought into close contact with the circular post 10 and fastened thereto. Further, the shock absorbing members 30A to 30C desirably have hollow interiors to improve their shock absorbing effects.

[0041] Referring now to FIG.5, a road safety barrier for a vehicle according to a second embodiment of the present invention will be described. The road safety barrier for a vehicle according to the second embodiment of the present invention includes articulated posts, and each articulated post is configured to have a concrete base structure 2 formed on the ground, a base 4 located on the base structure 2 by means of an L-shaped anchor 3, and a lower post 20 and a post 10 laminated sequentially on the base 4.

[0042] As shown in FIG.6, shock absorbing members 30 are disposed between the posts 10 and a pair of upper rail R1 and between the posts 10 and a pair of lower rail R2. The pair of upper rail R1 and the pair of lower rails R2 are fixed horizontally to the shock absorbing members 30. Rail reinforcing plates 40 are disposed between the upper rails R1 and the lower rails R2. This configuration is the same as in FIG.1.

[0043] According to the second embodiment of the present invention, the post 10 is not fixedly installed on the ground, but it is placed on top of the lower post 20. Further, the lower post 20 is not fixed to the base 4, but it is flexibly placed on top of the base 4. In this case, the lower post 20 has a convex portion 21 formed on the top surface thereof in such a manner as to be inserted into the lower side of the hollow post 10.

[0044] Furthermore, a spring operating plate 23, a spring 22, and a spring holder 24 are sequentially embedded into the post 10 in the order wherein the spring operating plate 23 is located on top of the interior of the post 10. Further, a wire 25 is passed through the spring 22 and fixed to the spring operating plate 23 on the upper end thereof and to the base portion 4 on the lower end thereof. In this case, it is possible that the upper and lower ends of the wire 25 are not fixed to the spring operating plate 23 and the base 4, and desirably, they are not passed through the spring operating plate 23 and the base 4. Further, the top surface of the post 10 is covered with a post cap C.

[0045] Referring to FIG.7, an explanation on the articulated post having the above-mentioned configuration will be given. As shown, if an external force like collision with a vehicle occurs, the post 10 becomes inclined in the direction to which the external force is applied, together with the upper rails R1 and the lower rails R2. At this time, the lower post 20 becomes inclined in the opposite direction to the inclined direction of the post 10 by means of reaction. Like this, if the post 10 becomes inclined, the wire 25 is bent to allow the spring operating plate 23 to which the wire 25 is fixed to be descended in the interior of the post 10. Through the descending operation, the spring 22 becomes compressed and elastically deformed. Of course, the post 10 becomes inclined over the convex portion 21 of the lower post 20.

[0046] As the spring 22 is compressed and elastically deformed, like this, an elastic force is generated in the direction where the spring 22 is tense. Accordingly, the spring operating plate 23 is ascended again to allow the wire 25 to be returned vertically to its original shape, thus vertically erecting the inclined post 10 again. At this time, the lower peripheral portion of the post 10 is guided along the convex portion 21 formed on the top portion of the lower post 20, thus allowing the post 10 to be returned to its original position, not to be just erected on the lower body 20.

[0047] While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or modify the embodiments without departing from the scope and spirit of the present invention.

Claims

1. A road safety barrier for a vehicle comprising:

a plurality of posts disposed at a given distance to each other;
a pair of upper rails disposed horizontally on both sides of the posts;
a pair of lower rails disposed horizontally on both sides of the posts in such a manner as to be spaced apart from the pair of upper rails by a given distance under the pair of upper rails;
shock absorbing members disposed between the posts and the pair of upper rails and between the posts and the pair of lower rails to form given gaps therebetween; and
rail reinforcing plates fixed to the pair of upper rails and the pair of lower rails and having at least one or more through holes formed thereon.

2. The road safety barrier for a vehicle according to claim 1, wherein each rail reinforcing plate further comprises reflection sheets attached to the exposed

surfaces on the space formed between the pair of upper rails and the pair of lower rails.

3. The road safety barrier for a vehicle according to claim 1, wherein each rail reinforcing plate is formed perpendicular to the pair of upper rails or the pair of lower rails, and the surfaces to which the reflection sheets are attached become more protruded as the surfaces go toward the inside.

4. The road safety barrier for a vehicle according to claim 1, wherein each rail reinforcing plate is slantly formed with respect to the pair of upper rails or the pair of lower rails.

5. The road safety barrier for a vehicle according to claim 1, wherein each shock absorbing member has a shape of a hollow post, and the plane shape of the shock absorbing member has a closed curve.

6. The road safety barrier for a vehicle according to claim 1, further comprising a reinforcing post located in the hollow interior of each post over the region which is bounded above the ground and under the ground, and the reinforcing post is shorter in length than the post.

7. The road safety barrier for a vehicle according to claim 6, wherein the post and the reinforcing post have fastening holes formed thereon in such a manner as to be fixed to each other by means of fastening means, and the fastening holes are formed plurally on the post or the reinforcing post in up and down directions thereof.

8. The road safety barrier for a vehicle according to claim 1, further comprising:

bases fixed to the ground or a base structure;
lower posts located on the bases and having top portions on which the posts are placed;
a spring embedded in each post;
a spring operating plate located on top of the spring; and
a wire connected to the spring operating plate on the upper end thereof and fixed to each base on the lower end thereof in such a manner as to be passed through the spring.

9. The road safety barrier for a vehicle according to claim 8, wherein each lower post has a convex portion formed on the top surface thereof to guide the post so that the post is returned to the original position thereof by means of the elastic force thereof.

10. The road safety barrier for a vehicle according to claim 9, wherein the convex portion is inserted into the lower side of the post.

11. The road safety barrier for a vehicle according to claim 10, wherein a spring holder is located between the convex portion and the spring.

12. The road safety barrier for a vehicle according to claim 8, wherein the lower post is located on the base, without being fixed to the base.

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FIG.1

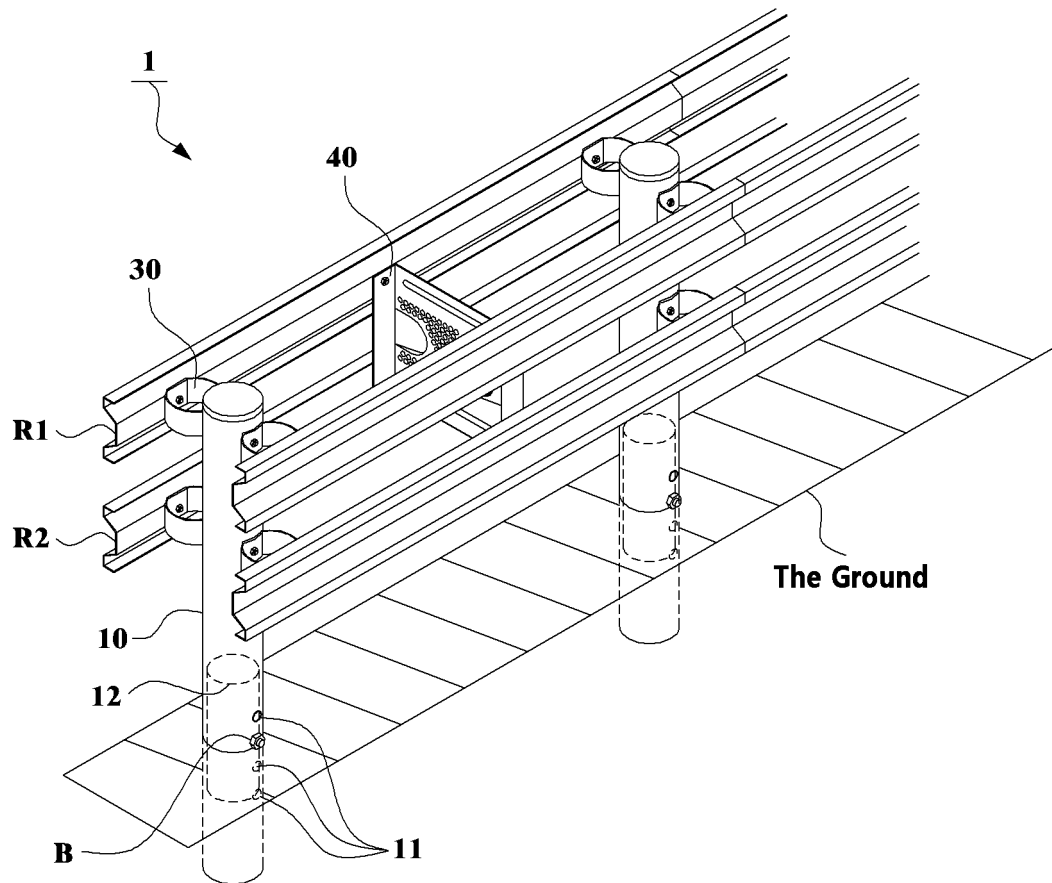


FIG.2

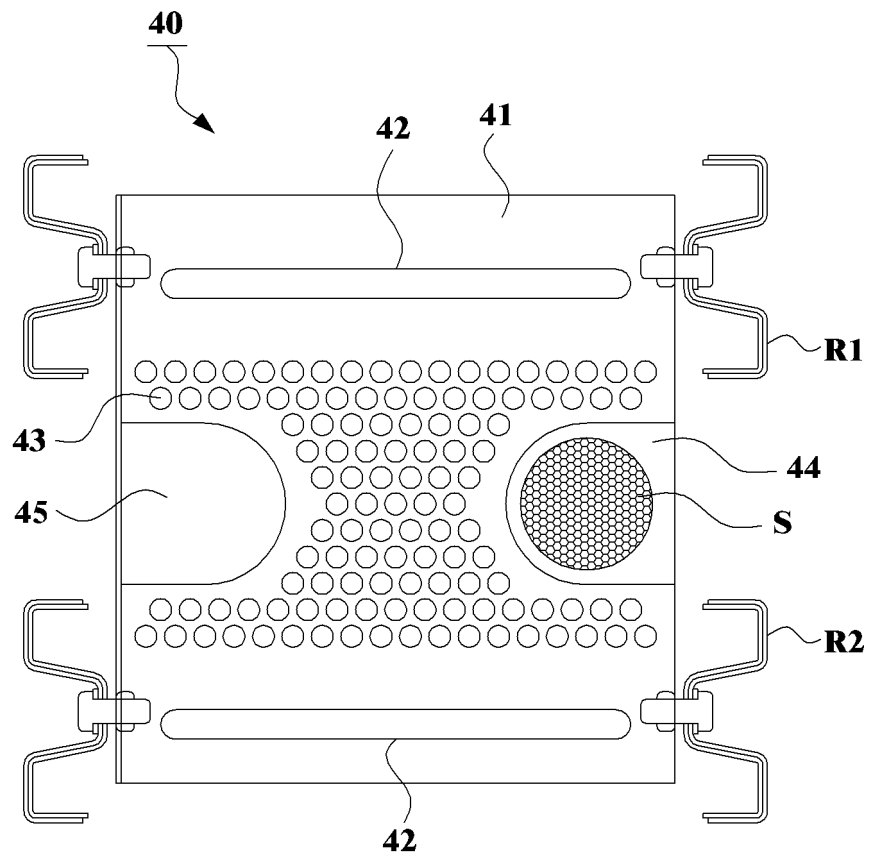


FIG.3

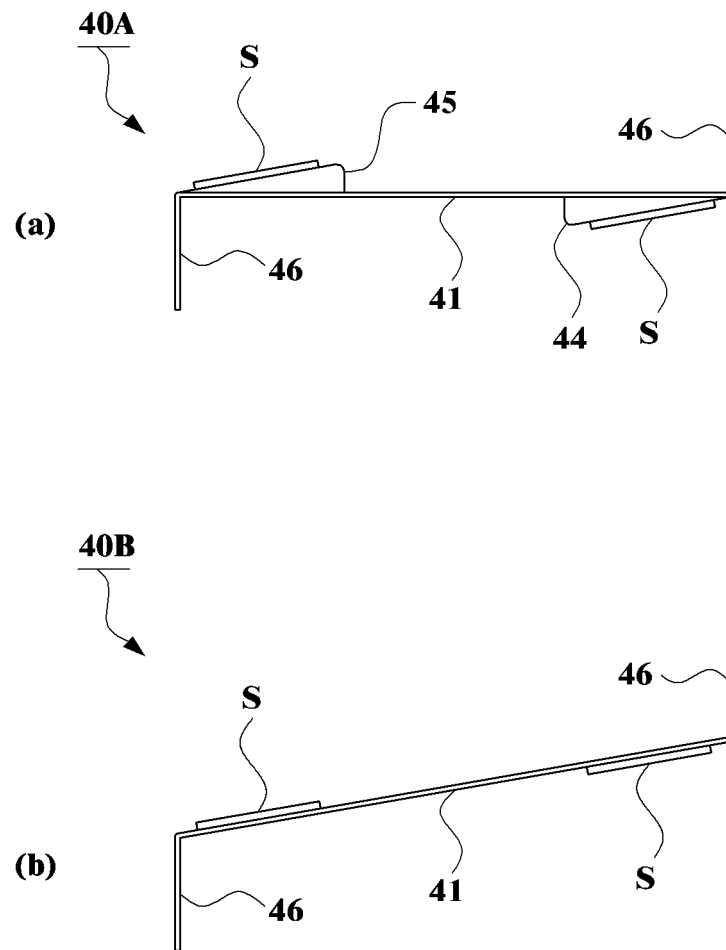


FIG.4

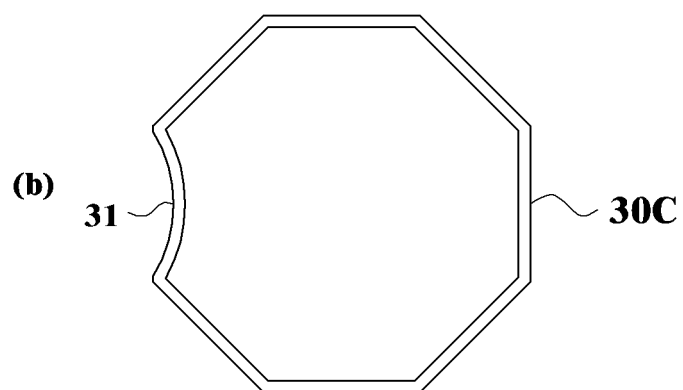
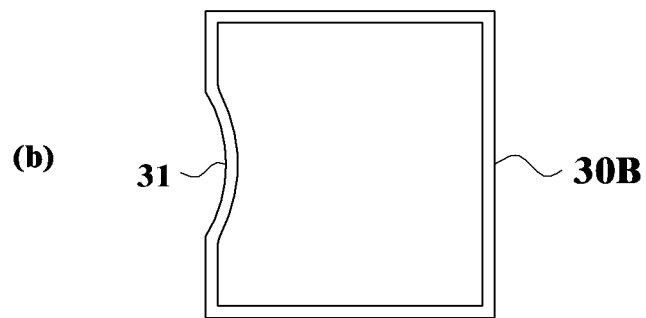
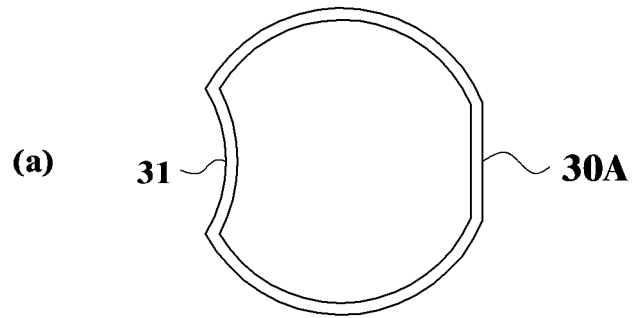


FIG.5

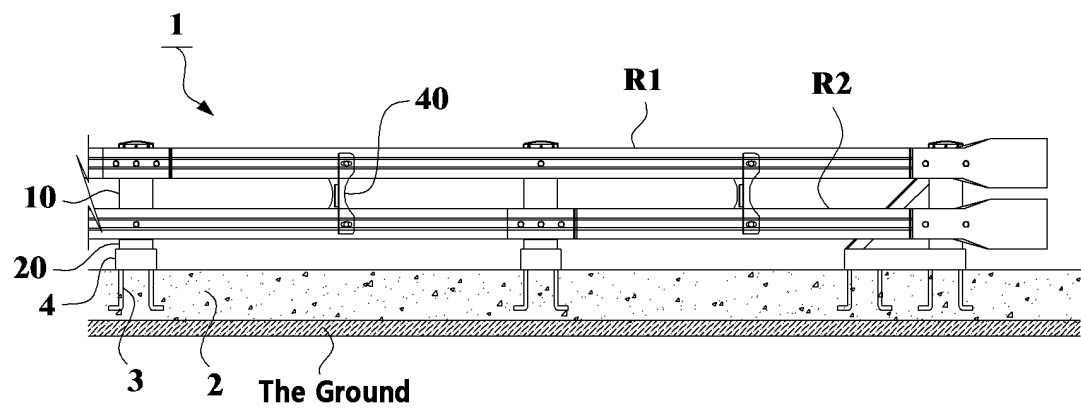


FIG.6

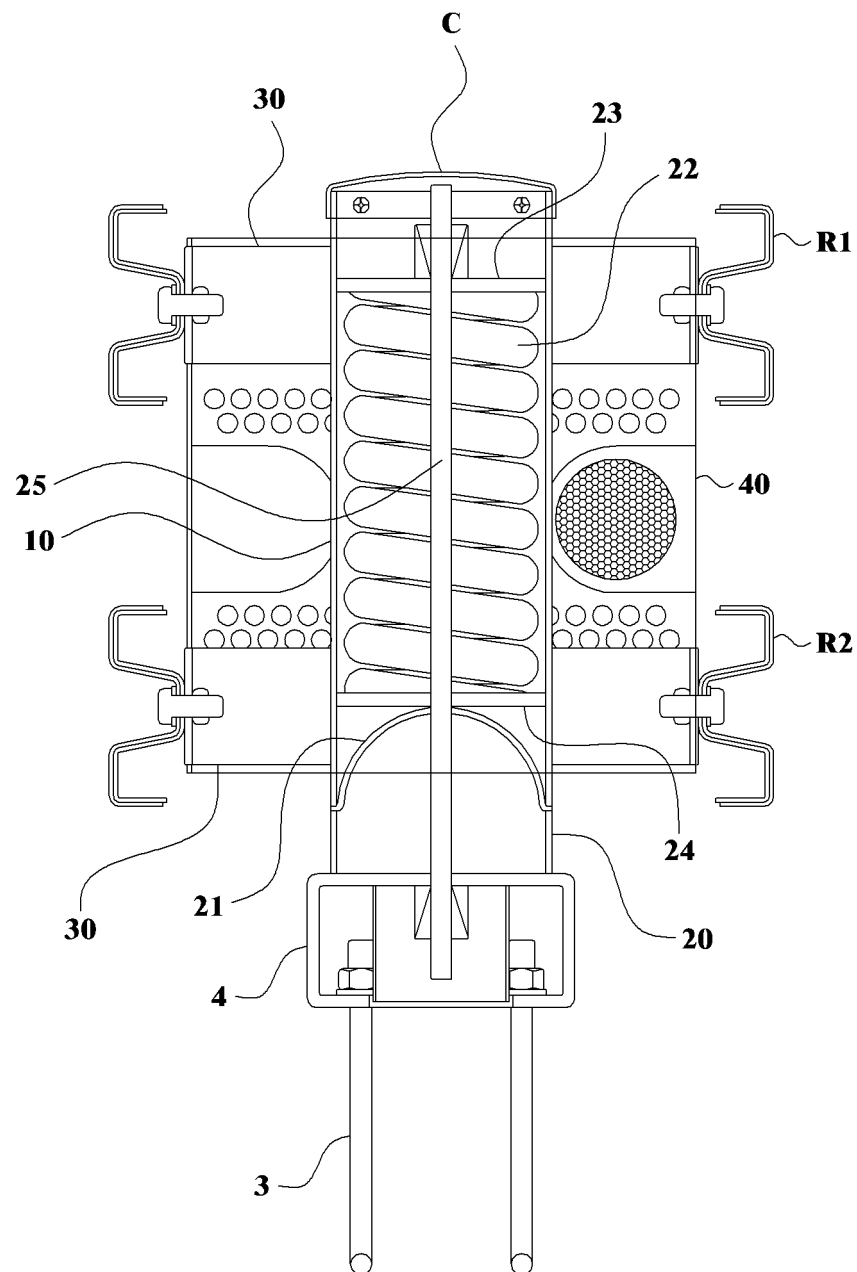
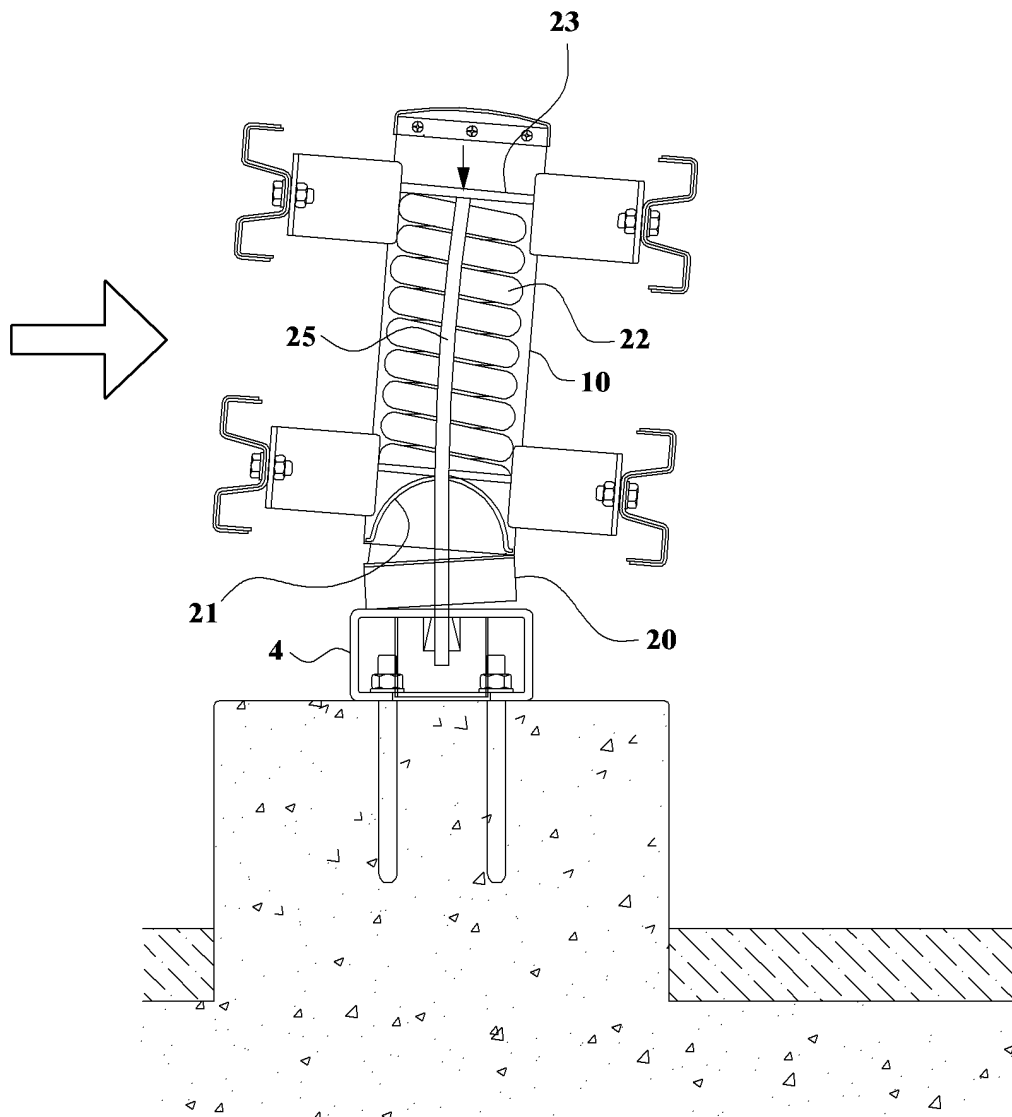


FIG.7



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2012/010068

A. CLASSIFICATION OF SUBJECT MATTER

E01F 15/00(2006.01)i, E01F 15/02(2006.01)i

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)

E01F 15/00

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

Korean Utility models and applications for Utility models: IPC as above

Japanese Utility models and applications for Utility models: IPC as above

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

eKOMPASS (KIPO internal) & Keywords: , ,

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 10-2005-0111539 A (KIM, Bok Soung) 25 November 2005 See claims 1, 2 and figures 1, 2	1-12
Y	KR 10-1083269 B1 (DO-A INDUSTRIAL CO., LTD.) 17 November 2011 See claims 1, 2 and figures 15-17	1-7
Y	KR 20-1999-0011836 U (KIM, Bok Soung) 25 March 1999 See claims 1-3 and figures 2, 3	8-12
A	KR 20-0311357 Y1 (DONG AR TECHNIQUE FIRM CO., LTD. et al.) 21 April 2003 See claim 1 and figure 1	1-12

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

* Special categories of cited documents:

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Date of the actual completion of the international search

10 JUNE 2013 (10.06.2013)

Date of mailing of the international search report

11 JUNE 2013 (11.06.2013)

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2012/010068

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