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(19) **United States**(12) **Patent Application Publication**
AHN(10) **Pub. No.: US 2022/0127806 A1**(43) **Pub. Date: Apr. 28, 2022**(54) **SAFETY FENCE FOR VEHICLE
PROTECTION**(52) **U.S. Cl.**CPC *E01F 15/0438* (2013.01); *E04H 17/146*
(2021.01); *E01F 15/043* (2013.01)(71) Applicant: **DECK CO., LTD**, Pohang-si (KR)(72) Inventor: **Min Young AHN**, Pohang-si (KR)(21) Appl. No.: **17/123,942**(22) Filed: **Dec. 16, 2020**(30) **Foreign Application Priority Data**

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(57)

ABSTRACT

Proposed is a safety fence for vehicle protection, including prop members installed vertically on a ground to be spaced apart from each other at regular intervals, a horizontal member installed horizontally to be supported on the prop members, and a coupling member configured to couple the horizontal member to each of the prop members. The coupling member is coupled at a first side thereof to the horizontal member and coupled at a second side thereof to each of the prop members, a guide hole is formed in the second side to guide the horizontal member when it is displaced due to external shocks, and the second side is fixedly coupled to the prop member by a fixing pin that passes through the guide hole to be fixed to the prop member.

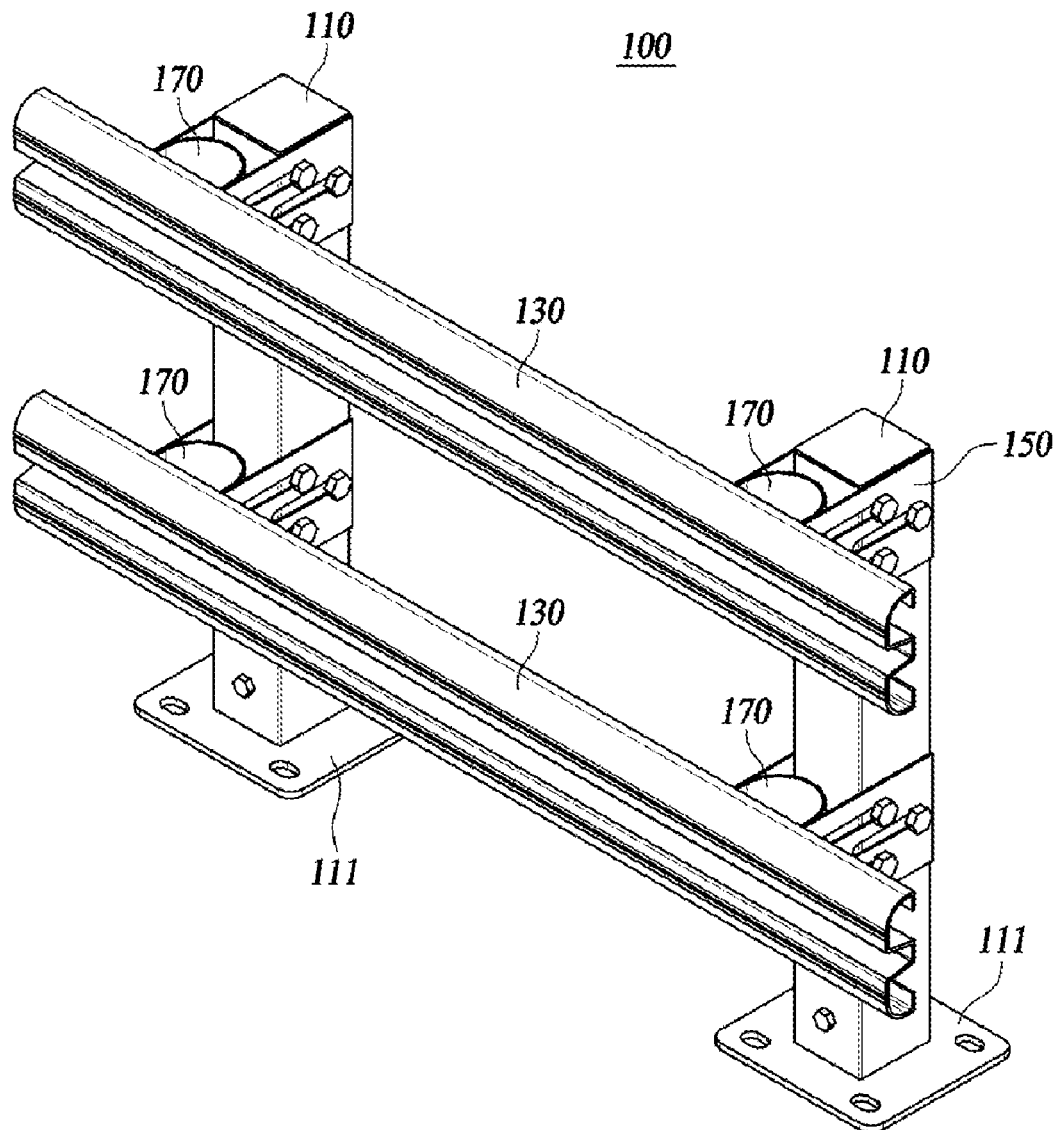


FIG. 1

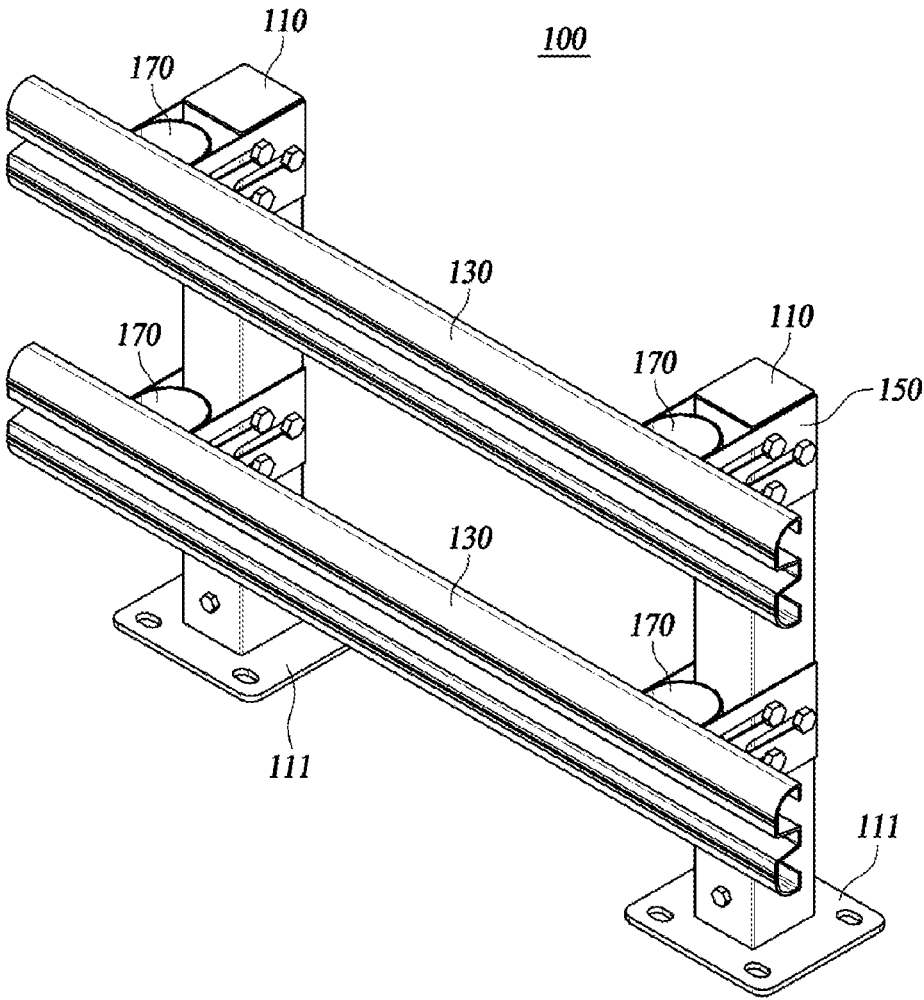


FIG. 2A

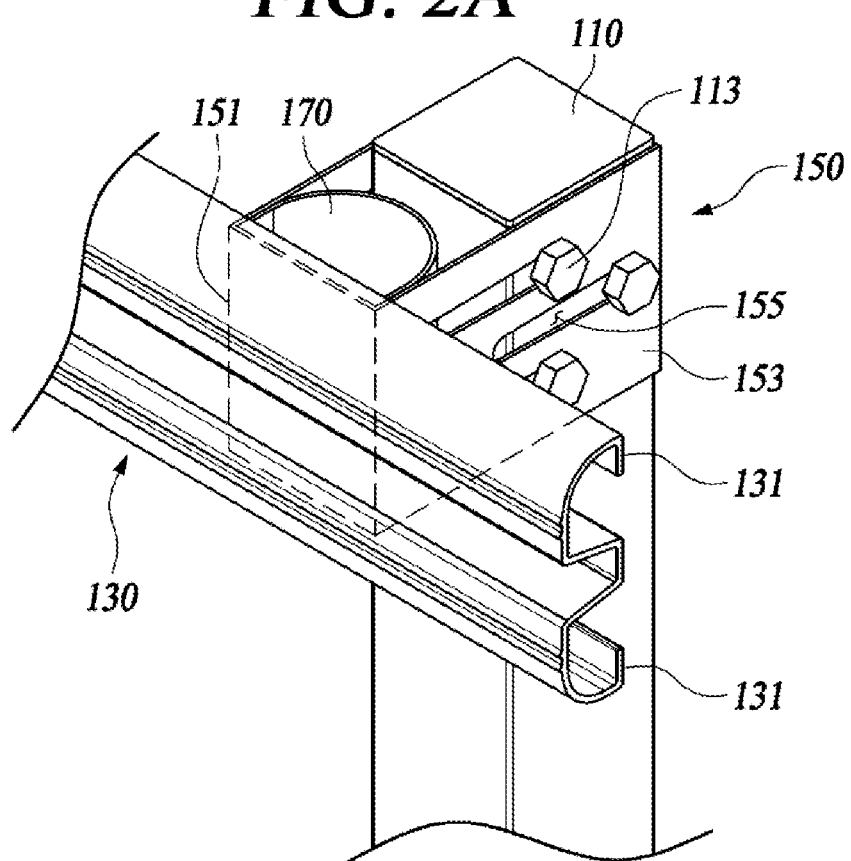


FIG. 2B

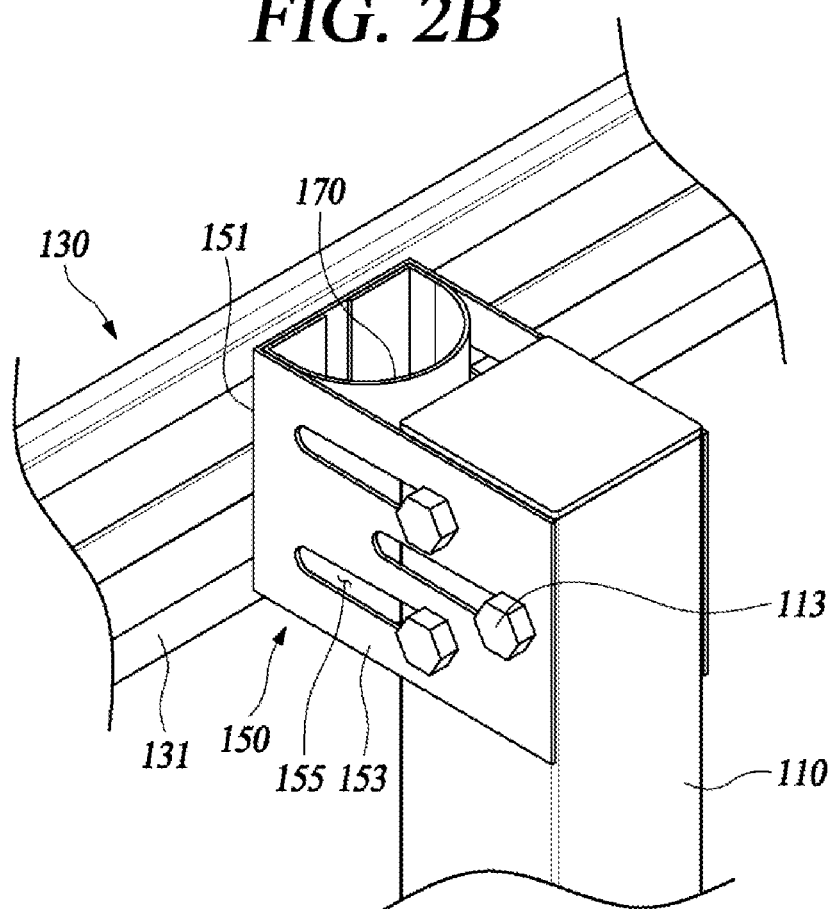


FIG. 3A

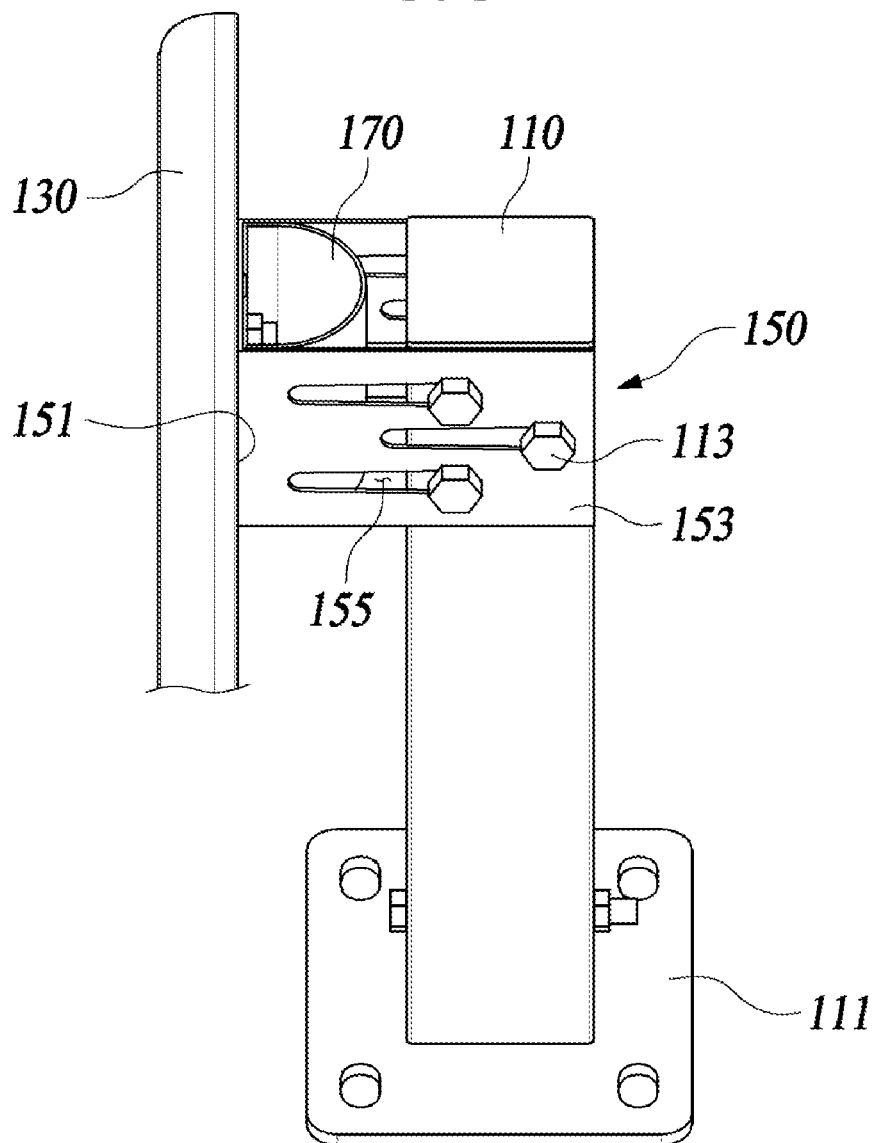


FIG. 3B

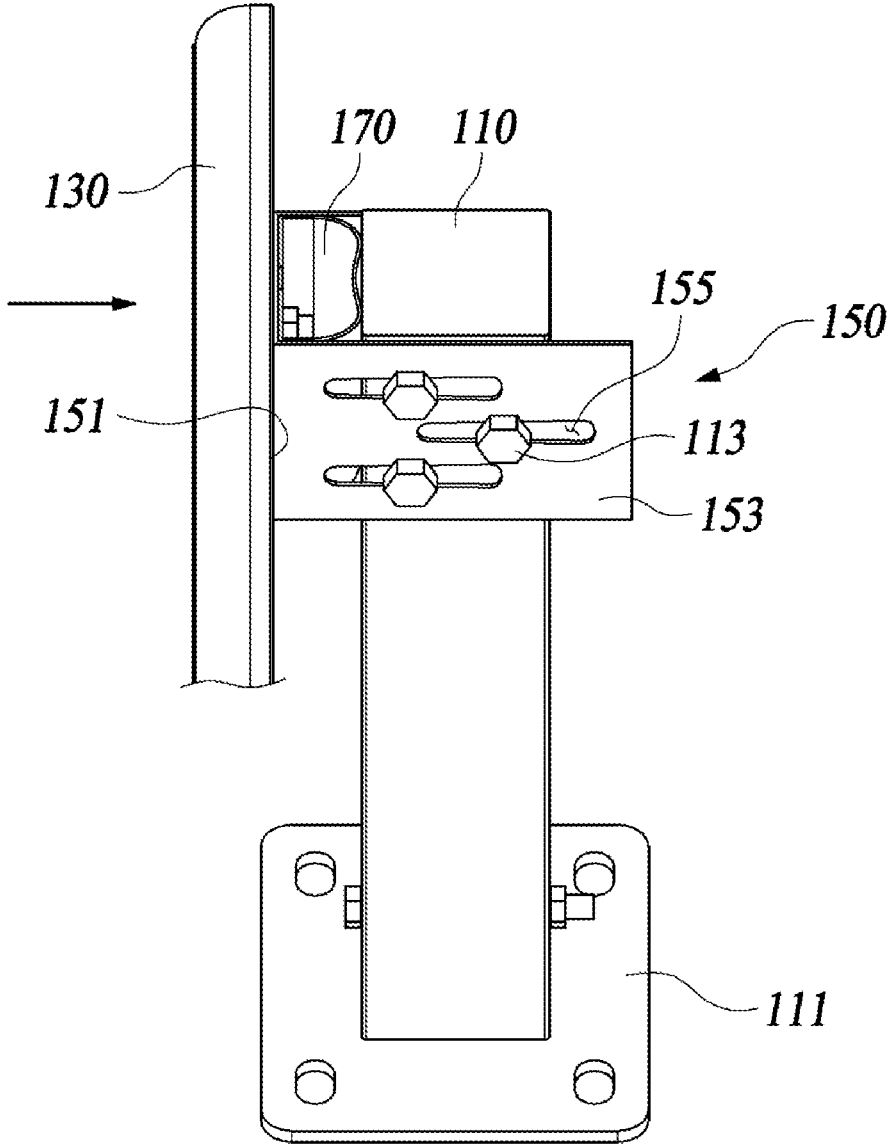


FIG. 4

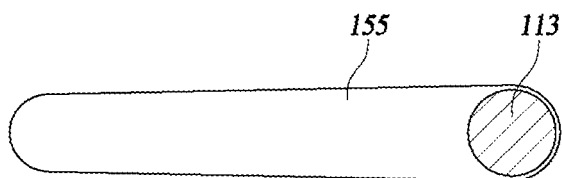


FIG. 5

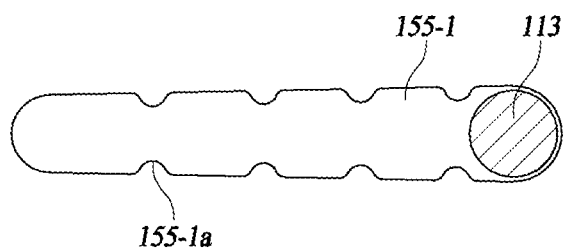


FIG. 6

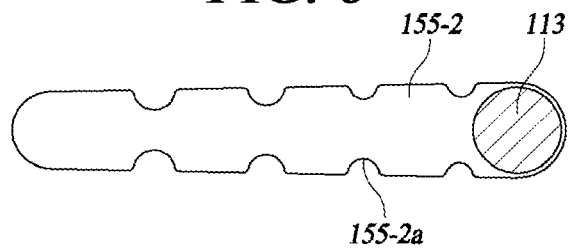


FIG. 7

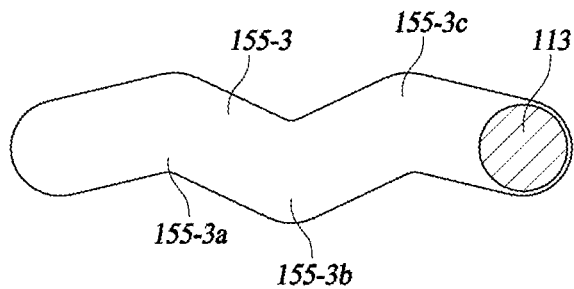


FIG. 8

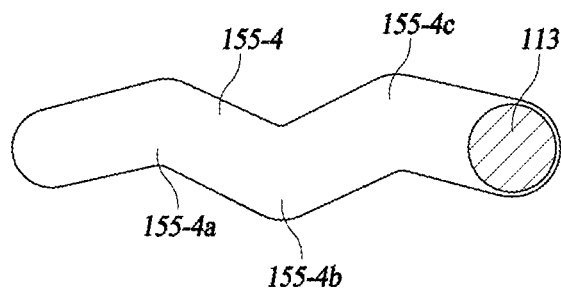


FIG. 9

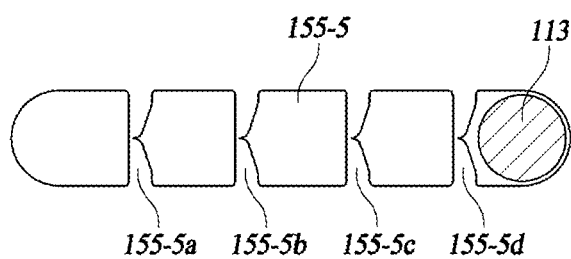
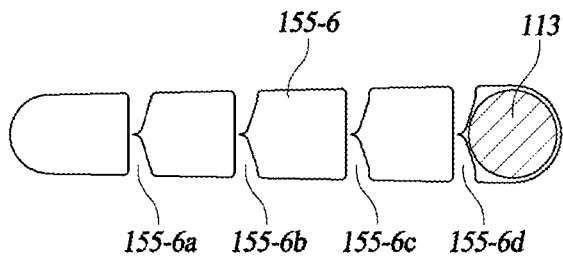


FIG. 10



SAFETY FENCE FOR VEHICLE PROTECTION

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to Korean Patent Application No. 10-2020-0138683, filed on Oct. 23, 2020, the disclosure of which is incorporated by reference herein in its entirety.

BACKGROUND OF THE DISCLOSURE

Field of the Disclosure

[0002] The present disclosure relates to a safety fence for vehicle protection and, more particularly, to a safety fence for vehicle protection, which is installed between a road and a sidewalk to prevent accidents on the sidewalk caused by a vehicle collision.

Related Art

[0003] A safety fence for vehicle protection is installed between a road where vehicles drive and a sidewalk where people walk, thus preventing pedestrians walking on the sidewalk from being injured when a vehicle enters the sidewalk because of careless driving or other accidents.

[0004] Furthermore, pedestrians may sometimes cross the road illegally. In order to prevent jaywalking, the safety fence for vehicle protection is installed.

[0005] Such a safety fence for vehicle protection includes a plurality of props that are installed on a boundary between the road and the sidewalk to be spaced apart from each other at regular intervals, and a support member that is horizontally installed between the props.

[0006] The support member may comprise a plurality of support members that are horizontally installed in the form of a bar between the props to be vertically spaced apart from each other. Further, the support members may be installed in the shape of giving a variety of visual effects.

[0007] In this case, the support members and the props may be directly coupled to each other by welding, or be coupled to each other by a separate coupling member.

[0008] However, the conventional safety fence for vehicle protection configured as described above is problematic in that a horizontal member may be bent or damaged in the event of a vehicle collision, and shocks generated thereby may be transmitted to the prop, so that the prop may also be bent or damaged.

[0009] Furthermore, the conventional safety fence for vehicle protection is problematic in that only a damaged part may not be repaired and an entire device should be replaced when the above-described phenomenon occurs, so that cost burden may be increased.

[0010] In the case of increasing the thickness of the support member or the prop to increase the strength of the support member or the prop and thereby minimize the bending or damage, a weight is increased and it is inconvenient to perform installation. Due to an increase in material cost, final installation cost may be increased.

[0011] Moreover, when the strength is increased, shocks caused by the vehicle collision may be transmitted to a vehicle driver due to reaction against the shocks caused by the vehicle collision, thus causing life damage.

Documents of Related Art

(Patent Document 0001) KR 20-0420392 Y1

SUMMARY

[0012] The present disclosure provides a safety fence for vehicle protection, which absorbs shocks in the event of a vehicle collision, thus minimizing damage.

[0013] In an aspect, a safety fence for vehicle protection is provided. The safety fence may include prop members installed vertically on a ground to be spaced apart from each other at regular intervals; a horizontal member installed horizontally to be supported on the prop members; and a coupling member configured to couple the horizontal member to each of the prop members, wherein the coupling member may be coupled at a first side thereof to the horizontal member and coupled at a second side thereof to each of the prop members, a guide hole may be formed in the second side to guide the horizontal member when it is displaced due to external shocks, and the second side may be fixedly coupled to the prop member by a fixing pin that passes through the guide hole to be fixed to the prop member.

[0014] Thus, the safety fence for vehicle protection allows shocks to be primarily absorbed by the coupling of the guide hole and the fixing pin when external shocks of a vehicle or the like are applied to the support member, and allows shocks to be secondarily absorbed by friction while the fixing pin slidably moves in the guide hole.

[0015] Furthermore, it is possible to predict a moving direction due to shocks on a sidewalk as the support member slidably moves in a direction of the guide hole, i.e. a predetermined direction, so that the problem of the related art which does not cope with irregular damage to cause life damage can be minimized.

[0016] Furthermore, since a shock absorbing function may be performed by the coupling of components, the method of increasing a structural strength by increasing the thickness of the components to increase the rigidity of the components is not required, so that installation cost is reduced and a light structure is realized, thus making it easy for a worker to perform an operation.

[0017] The coupling member may include a horizontal-member coupling part coupled to the horizontal member; and a pair of prop-member coupling parts extending from both ends of the horizontal-member coupling part to the prop member to be coupled to both sides of the prop member, the guide hole being formed in each of the prop-member coupling parts.

[0018] Thus, the moving direction of the support member can be more firmly restrained by the pair of prop-member coupling parts, so that a problem where the support member is damaged in an irregular direction can be more effectively minimized, in addition to improving primary and secondary shock absorbing operations.

[0019] The safety fence may further include an elastic deforming member installed between the horizontal-member coupling part and each of the prop members to absorb shocks.

[0020] Thus, the elastic deforming member is elastically deformed when external shocks are generated by a vehicle or the like, thus absorbing shocks and thereby minimizing the transmission of shocks to other members.

[0021] The guide hole may be reduced in width in a direction where the fixing pin is relatively moved.

[0022] Thus, when the fixing pin relatively slides in the guide hole and is further moved by shocks, the fixing pin is subjected to a higher level of resistance due to the shape of the guide hole, thus more effectively absorbing shocks.

[0023] Here, protrusions may be formed in the guide hole at regular intervals, or the guide hole may include a plurality of bent parts that are vertically bent, or the guide hole may be separated by a plurality of rupture parts.

[0024] Thus, resistance is increased by the tapered shape as well as the protrusion, the bent part, and the rupture part, thus more effectively absorbing shocks.

[0025] Furthermore, the bent part is vertically bent, so that, when external shocks are horizontally applied, the support member is moved horizontally as well as vertically due to the shape of the bent part, and thereby shocks can be absorbed by a coupling force between another prop and the horizontal member. Consequently, it is possible to attenuate shocks transmitted horizontally.

[0026] Meanwhile, in an embodiment where the guide hole is not reduced in width in a moving direction and has a leveled shape, a plurality of vertically bent parts may be formed in the guide hole, or the guide hole may be separated by a plurality of rupture parts.

[0027] Thus, shocks can be absorbed or dispersed by resistance due to the tapered shaped as well as by the bent parts and the rupture parts, so that damage can be minimized.

Advantageous Effects

[0028] According to the present disclosure, a safety fence for vehicle protection allows shocks to be primarily absorbed by the coupling of a guide hole and a fixing pin when external shocks of a vehicle or the like are applied to a support member, and allows shocks to be secondarily absorbed by friction while the fixing pin slidably moves in the guide hole.

[0029] Furthermore, it is possible to predict a moving direction due to shocks on a sidewalk as a support member slidably moves in a direction of a guide hole, i.e. a predetermined direction, so that the problem of the related art which does not cope with irregular damage to cause life damage can be minimized.

[0030] Furthermore, as a horizontal member is installed on the front of a prop member facing a road and the horizontal member is prevented from moving deep into a sidewalk, at least beyond the prop member, accidents on the sidewalk can be dramatically reduced even in the event of a vehicle collision.

[0031] Furthermore, the moving direction of a horizontal member can be more firmly restrained by a pair of prop-member coupling parts, so that a problem where the horizontal member is damaged in an irregular direction can be more effectively minimized, in addition to improving primary and secondary shock absorbing operations.

[0032] Furthermore, an elastic deforming member is elastically deformed when external shocks are generated by a vehicle or the like, thus absorbing shocks and minimizing the transmission of shocks to other members.

[0033] Furthermore, when a fixing pin relatively slides in a guide hole and is further moved by shocks, the fixing pin is subjected to a higher level of resistance due to the shape of the guide hole, thus more effectively absorbing shocks.

[0034] Furthermore, resistance is increased by a tapered shape as well as a protrusion, a bent part, and a rupture part, thus more effectively absorbing shocks.

[0035] Furthermore, a bent part is vertically bent, so that, when external shocks are horizontally applied, a support member is moved horizontally as well as vertically due to the shape of the bent part, and thereby shocks can be absorbed by a coupling force between another prop and a horizontal member. Consequently, it is possible to attenuate shocks transmitted horizontally.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] FIG. 1 is a diagram showing a safety fence for vehicle protection in accordance with a preferred embodiment of the present disclosure.

[0037] FIGS. 2A and 2B are enlarged views showing a coupling part of the safety fence for vehicle protection shown in FIG. 1.

[0038] FIGS. 3A and 3B are diagrams illustrating an operation when shocks are generated by a vehicle or the like.

[0039] FIGS. 4 to 10 are diagrams illustrating guide holes in accordance with other embodiments of the present disclosure.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0040] Hereinafter, a safety fence for vehicle protection in accordance with a preferred embodiment of the present disclosure will be described with reference to the accompanying drawings.

[0041] FIG. 1 is a diagram showing a safety fence for vehicle protection in accordance with a preferred embodiment of the present disclosure, FIGS. 2A and 2B are enlarged views illustrating an important part of the safety fence for vehicle protection shown in FIG. 1, and FIGS. 3A and 3B are diagrams illustrating the operation of the safety fence for vehicle protection.

[0042] Referring to FIGS. 1 to 3B, the safety fence 100 for vehicle protection in accordance with the preferred embodiment of the present disclosure includes a prop member 110, a horizontal member 130, and a coupling member 150.

[0043] The prop member 110 may comprise a plurality of prop members that are vertically installed on a boundary between a road and a sidewalk to be spaced apart from each other, and the horizontal member 130 is mounted on the prop member 110. A bottom of the prop member is firmly secured to the ground by a ground fixing member 111.

[0044] The horizontal member 130 may be coupled to the front of the prop member 110 facing the road. The horizontal member separates the road from the sidewalk, absorbs shocks in the event of a vehicle collision, and comprises horizontal members that may be installed in multiple lines to be vertically spaced apart from each other.

[0045] The coupling member 150 couples the horizontal member 130 to the prop member 110, is coupled at a first side thereof to the horizontal member 130, and is coupled at a second side thereof to the prop member 110 to secure the horizontal member 130 to the prop member 110.

[0046] Here, a guide hole 155 is formed in the second side to guide the horizontal member 130 when it is pushed towards the sidewalk due to external shocks of the vehicle

or the like. A fixing pin 113 passes through the guide hole 155 to be secured to a surface of the prop member 110 facing the guide hole 155.

[0047] Such a structure allows shocks to be primarily absorbed by the fixing force of the coupling member 150 in which the fixing pin 113 and the guide hole 155 are formed, and allows shocks to be secondarily absorbed by friction while the fixing pin 113 slides in the guide hole 155, if external shocks by the vehicle or the like are applied from the road to the sidewalk.

[0048] In other words, as shown in FIGS. 3A and 3B, while the horizontal member 130 is slidably guided to the sidewalk by the guide hole 155 and the fixing pin 113, shocks may be absorbed.

[0049] Furthermore, as the movement of the horizontal member 130 is guided in the direction of the guide hole 155, i.e. in a predetermined direction, a pedestrian may avoid the horizontal member by predicting the moving direction of the horizontal member. This solves the problem of the related art where a pedestrian may not recognize the moving direction of the horizontal member since the horizontal member is moved or broken in an irregular and unpredicted direction, thus causing life damage.

[0050] As the horizontal member 130 is installed on the front of the prop member 110 facing the road and the horizontal member 130 is prevented from moving deep into the sidewalk, at least beyond the prop member 110, accidents on the sidewalk may be dramatically reduced even in the event of a vehicle collision.

[0051] According to the preferred embodiment of the present disclosure, the coupling member 150 includes a horizontal-member coupling part 151 and prop-member coupling parts 153.

[0052] The horizontal-member coupling part 151 is coupled to the horizontal member 130 to fixedly couple the horizontal member 130 to the prop member 110, and a coupling surface 131 is formed on the rear of the horizontal member 130 to be coupled to the horizontal-member coupling part 151, and the horizontal-member coupling part 151 has an opposite coupling surface facing the coupling surface 131 of the horizontal member 130.

[0053] The prop-member coupling parts 153 extend from both ends of the horizontal-member coupling part 151 to the prop member 110 to be coupled to both sides of the prop member 110. The guide hole 155 is formed in each prop-member coupling part 153 and interacts with the fixing pin 113 to guide the sliding movement of the horizontal member 130.

[0054] Pairs of guide holes 155 and fixing pins 113 may be provided on the pair of prop-member coupling parts 153 so that the prop-member coupling parts 153 may more firmly restrain the moving direction of the horizontal member 130. Thus, such a configuration may more effectively minimize a problem where the horizontal member is damaged in an irregular direction, in addition to improving primary and secondary shock absorbing operations.

[0055] Preferably, an elastic deforming member 170 is installed between the horizontal-member coupling part 151 and the prop member 110 to absorb shocks. The external shocks generated by the vehicle or the like may be absorbed by the guide holes 155 and the fixing pins 113 of the prop-member coupling parts 153 as well as the elastic deforming member 170.

[0056] By the rigidity of components themselves as well as the mutual coupling relationship and operational relationship between the components, external shocks generated by a vehicle or the like may be absorbed. Thus, the method of increasing the structural strength by increasing the thickness of components to increase the rigidity of the components is not required, so that installation cost is reduced and a light structure is realized, thus making it easy for a worker to perform an operation.

[0057] FIG. 4 illustrates the shape of a guide hole in accordance with a preferred embodiment of the present disclosure. The guide hole is formed in a shape reduced in width in a direction where the fixing pin 113 moves relative to the guide hole 155, i.e. a tapered shape.

[0058] In other words, if the horizontal member 130 is moved rightwards by shocks in FIG. 4, the fixing pin 113 is moved leftwards in the guide hole 155. As a guide width is gradually reduced, resistance to the movement of the fixing pin 113 is increased and consequently shocks can be absorbed.

[0059] Meanwhile, FIG. 5 illustrates the shape of a guide hole in accordance with another preferred embodiment of the present disclosure. Protrusions 155-1a may be formed in the tapered guide hole shown in FIG. 4.

[0060] In other words, resistance to the movement of the fixing pin 113 is increased as the width is gradually reduced due to the tapered shape, and the protrusions 155-1a should be broken for the sliding movement, so that shocks may be absorbed once more by the protrusions 155-1a.

[0061] Furthermore, FIG. 6 illustrates the shape of a guide hole in accordance with a further preferred embodiment of the present disclosure. In FIG. 5, the protrusions 155-1a are formed at a uniform height. However, in this embodiment, the heights of protrusions 155-2a are gradually increased in a direction opposite to the tapered shape, so that it is possible to absorb shocks using a higher level of resistance.

[0062] Meanwhile, FIG. 7 illustrates the shape of a guide hole in accordance with another preferred embodiment of the present disclosure. The guide hole 155-3 includes a plurality of bent parts 155-3a, 155-3b, and 155-3c that are vertically bent.

[0063] When the horizontal member 130 is slidably moved towards the sidewalk by shocks, the bent parts 155-3a, 155-3b, and 155-3c cause the horizontal member to be moved horizontally as well as vertically, so that shocks may be dispersed horizontally and vertically and thereby horizontal shocks may be alleviated.

[0064] In other words, when the horizontal member is moved upwards or downwards by the bent parts 155-3a, 155-3b, and 155-3c, the vertical movement absorbs shocks while resistance is applied by another part of the horizontal member 130 that is not subjected to shocks, thus alleviating horizontal shocks.

[0065] Meanwhile, FIG. 8 illustrates the shape of a guide hole in accordance with another preferred embodiment of the present disclosure. The guide hole of FIG. 8 is different from the guide hole of FIG. 7 in that the guide hole has a tapered shape 155-4.

[0066] In other words, this may alleviate shocks by bent parts 155-4a, 155-4b, and 155-4c when the horizontal member 130 is further moved, and may increase resistance due to the tapered shape, thus absorbing shocks, in addition to the effects of the embodiment shown in FIG. 7.

[0067] Meanwhile, FIG. 9 illustrates the shape of a guide hole in accordance with another preferred embodiment of the present disclosure. The guide hole 155-5 is separated by a plurality of rupture parts 155-5a, 155-5b, 155-5c, and 155-5d.

[0068] In other words, the plurality of rupture parts 155-5a, 155-5b, 155-5c, and 155-5d may be sequentially ruptured by the fixing pin 113 as the horizontal member 130 is moved, thus absorbing shocks.

[0069] Furthermore, FIG. 10 illustrates the shape of a guide hole in accordance with another preferred embodiment of the present disclosure. The guide hole of FIG. 10 is different from the guide hole of FIG. 9 in that the guide hole has a tapered shape 155-6.

[0070] In other words, this may increase resistance due to the tapered shape when the horizontal member 130 is further moved, thus absorbing shocks, in addition to the effects of rupture parts 155-6a, 155-6b, 155-6c, and 155-6d as in the embodiment shown in FIG. 9.

[0071] Thus, it is apparent to those of ordinary skill in the art that the present disclosure may be changed and modified in various ways without departing from the scope of the present disclosure. Therefore, it should be understood that the present embodiments are illustrative and not restrictive.

[0072] The scope of the present disclosure is therefore to be determined solely by the appended claims. All technical ideas within an equivalent scope should be interpreted as being included in the scope of the present disclosure.

[Detailed Description of Main Elements]

100: safety fence for vehicle protection
 110: prop member
 111: ground fixing member
 113: fixing pin
 130: horizontal member
 131: coupling surface
 150: coupling member
 151: horizontal-member coupling part
 153: prop-member coupling part
 155, 155-1, 155-2, 155-3, 155-4, 155-5, 155-6: guide hole
 155-1a, 155-2a: protrusion
 155-3a, 155-3b, 155-3c, 155-4a, 155-4b, 155-4c: bent part
 155-5a, 155-5b, 155-5c, 155-5d, 155-6a, 155-6b, 155-6c, 155-6d: rupture part
 170: elastic deforming member

What is claimed is:

1. A safety fence for vehicle protection, comprising:
 - prop members installed vertically on a ground to be spaced apart from each other at regular intervals;
 - a horizontal member installed horizontally to be supported on the prop members; and
 - a coupling member configured to couple the horizontal member to each of the prop members,
 wherein the coupling member is coupled at a first side thereof to the horizontal member and coupled at a second side thereof to each of the prop members, a guide hole is formed in the second side to guide the horizontal member when it is displaced due to external shocks, and the second side is fixedly coupled to the prop member by a fixing pin that passes through the guide hole to be fixed to the prop member.
2. The safety fence of claim 1, wherein the coupling member comprises:
 - a horizontal-member coupling part coupled to the horizontal member; and
 - a pair of prop-member coupling parts extending from both ends of the horizontal-member coupling part to the prop member to be coupled to both sides of the prop member, the guide hole being formed in each of the prop-member coupling parts.
3. The safety fence of claim 2, further comprising:
 - an elastic deforming member installed between the horizontal-member coupling part and each of the prop members to absorb shocks.
4. The safety fence of claim 3, wherein the guide hole is reduced in width in a direction where the fixing pin is relatively moved.
5. The safety fence of claim 4, wherein protrusions are formed in the guide hole at regular intervals.
6. The safety fence of claim 4, wherein the guide hole comprises a plurality of bent parts that are vertically bent.
7. The safety fence of claim 4, wherein the guide hole is separated by a plurality of rupture parts.
8. The safety fence of claim 1, wherein the guide hole comprises a plurality of bent parts that are vertically bent.
9. The safety fence of claim 1, wherein the guide hole is separated by a plurality of rupture parts.

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