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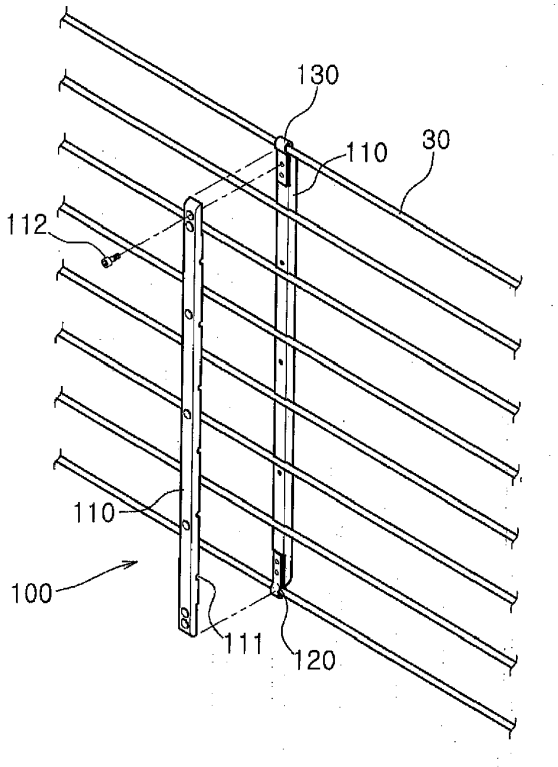
(54) SAFETY DEVICE FOR ELECTRIC LOCOMOTIVE PLATFORM CAPABLE OF MAINTAINING INTERVAL BETWEEN ROPES

(57) A safety device for an electric locomotive platform is proposed. The safety device includes: a plurality of ropes (30) disposed in a horizontal direction and spaced apart from each other in a vertical direction; and a rope interval maintenance unit (100) suppressing the plurality of ropes (30) from being deformed by an external force and suppressing intervals of the plurality of ropes (30) from being changed, thereby providing the safety device for the electric locomotive platform being advantageous in terms of preventing a safety accident.

FIG. 6



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present disclosure relates to a safety device for an electric locomotive platform capable of maintaining an interval between ropes and, more particularly, to a safety device for an electric locomotive platform capable of minimizing an occurrence of a safety accident by maintaining a vertical interval of ropes.

Description of the Related Art

[0002] In general, as shown in FIGS. 1 and 2, a safety device for an electric locomotive platform includes: at least one pair or more of lift driving units 10 installed at a selected position between an entrance of a platform to which an electric locomotive enters and an exit of the platform; movement bodies 20 on opposite sides of the ropes and each provided on an inner side of each of a pair of lift driving units 10 and each moved in an up-and-down (i.e., vertical) direction by each of the lift driving units 10; and a plurality of ropes 30 connecting the movement bodies 20 on the opposite sides of the ropes 30 to each other in a horizontal direction. This device is capable of blocking passage by lowering the ropes 30 when passengers are waiting on a platform (see FIG. 1), and allowing the passage by raising the ropes 30 when the passengers are on board an electric locomotive (see FIG. 2).

[0003] However, in such a safety device for the electric locomotive platform, when a passenger grabs and shakes a rope 30, the rope 30 is twisted, or deformation in which an interval between the ropes 30 is widened easily occurs, whereby there is a problem in that a hand or a body part of the passenger may easily pass through the interval between the ropes. In addition, while moving up and down, when the ropes 30 collide with a passenger or an obstacle, serious injury or damage may be caused. In addition, when any one of the ropes 30 is cut, tension of the remaining ropes may not be uniformly maintained, and thus passage of the passenger may not be blocked or allowed.

Documents of Related Art

[0004]

(Patent Document 1) KR 10-0601112 B1 (July 19, 2006)
(Patent Document 2) JP 2008-534827 A (August 28, 2008)
(Patent Document 3) KR 10-1143843 B1 (May 4, 2012)
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(Patent Document 7) KR 10-2015-0013410 A (February 5, 2015)
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SUMMARY OF THE INVENTION

[0005] An exemplary embodiment of the present disclosure is described to provide a safety device for an electric locomotive platform, wherein ropes are connected and fixed to each other in a vertical direction to prevent a passenger from easily widening or deforming the ropes. The exemplary embodiment of the present disclosure is described to provide a safety device for an electric locomotive platform capable of preventing injury or damage by performing a buffer function when ropes moving up and down collide with a passenger or an obstacle. The exemplary embodiment of the present disclosure is described to provide a safety device for an electric locomotive platform capable of maintaining tension by fixing the remaining ropes even when any one of the ropes is cut.

[0006] According to the exemplary embodiment of the present disclosure, there is provided a safety device for an electric locomotive platform, the safety device including: at least one pair or more of lift driving units 10 provided at a selected position between an entrance of the platform to which an electric locomotive enters and an exit of the platform; movement bodies 20 provided on opposite sides of ropes and each moved in an up-and-down direction by each of the pair of the lift driving units 10; a plurality of ropes 30 disposed at an interval therebetween so as to be spaced apart from each other in the up-and-down direction between the pair of the lift driving units 10, and connecting the movement bodies 20 on the opposite sides of the ropes to each other in a horizontal direction; and a rope interval maintenance unit 100 securing each interval of the plurality of ropes 30 by connecting the plurality of ropes 30 to each other in a vertical direction so as to suppress the plurality of ropes 30 from being deformed by an external force and suppress each interval of the plurality of ropes 30 from being changed.

[0007] Each of the movement bodies 20 on opposite sides of the ropes may be provided on an inner side of each of a pair of lift driving units 10.

[0008] The rope interval maintenance unit 100 may include: a fixing part 110 provided to fix the plurality of ropes 30 to each other in the vertical direction; a first buffer part 120 fixing a rope provided at a lowest position of the ropes 30 to a lower part of the fixing part 110 to be able to perform a buffer function in an event of colliding with a passenger or an obstacle; and a second buffer part 130 fixing a rope provided at a highest position of

the ropes 30 to an upper part of the fixing part 110 to be able to perform a buffer function in an event of colliding with a passenger or an obstacle.

[0009] The first buffer part 120 and the second buffer part 130 may respectively have buffer spaces 121 and 131 therein through which, among the plurality of ropes 30, the lowermost and uppermost ropes may pass in the horizontal direction, the buffer spaces being formed to cushion a collision in the vertical direction in the event of colliding with a passenger or an obstacle. The fixing part 110 may be formed of a hard material, and the first buffer part 120 and the second buffer part 130 may be formed of a soft material.

[0010] According to the exemplary embodiment of the present disclosure, ropes are connected and fixed to each other in a vertical direction so that a passenger may not easily widen or deform the ropes, thereby preventing a safety accident from occurring. In addition, when the ropes moving up and down collide with a passenger or an obstacle, a buffer function is performed, thereby preventing injury or damage from occurring. In addition, even when any one or more of the ropes are cut, since tension of the ropes may be maintained by fixing the remaining ropes to each other, an action to block or allow passage for the passenger may be performed continually. In addition, a structure of the safety device is simple and maintenance is easy, thereby improving durability and service life.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIGS. 1 and 2 are front views schematically showing a configuration, operation, etc. of a safety device for an electric locomotive platform according to the related art.

FIGS. 3 and 4 are front views schematically showing a configuration, operation, etc. of a safety device for an electric locomotive platform according to an exemplary embodiment of the present disclosure.

FIGS. 5 to 8 are respectively a combined perspective view, an exploded perspective view, a front view, and a side view, showing a rope interval maintenance unit shown in FIG. 3.

FIG. 9 is an enlarged view showing part A of FIG. 8.

FIG. 10 is an enlarged view showing part B of FIG. 8.

DETAILED DESCRIPTION OF THE INVENTION

[0012] Hereinafter, an exemplary embodiment of the present disclosure will be described with reference to the accompanying drawings.

[0013] A safety device for an electric locomotive platform according to the exemplary embodiment of the present disclosure may minimize an occurrence of a safety accident by maintaining a vertical interval of a rope as an interval that is set during manufacturing of the rope. Such a configuration of the safety device for the electric locomotive platform according to the exemplary embodiment of the present disclosure are shown in FIGS. 3 to 10.

[0014] Referring to FIGS. 3, 4, etc., the safety device for the electric locomotive platform according to the exemplary embodiment of the present disclosure includes: at least one pair or more of lift driving units 10 installed at a selected position between an entrance of a platform to which an electric locomotive enters and an exit of the platform; movement bodies 20 on opposite sides of the ropes and each moved in an up-and-down (i.e., vertical) direction by each of a pair of the lift driving units 10; a plurality of ropes 30 disposed at an interval so as to be spaced apart from each other in the up-and-down (i.e., vertical) direction between the lift driving units 10 that form a pair, and connecting the movement body 20 on the opposite sides to each other in a horizontal direction; and at least one or more of rope interval maintenance units 100 securing each interval of the plurality of ropes 30 by connecting the plurality of ropes 30 to each other in a vertical direction so as to suppress the plurality of ropes 30 from being deformed by an external force and suppress each interval of the plurality of ropes 30 from being changed.

[0015] The lift driving units 10 that form a pair may be disposed at a regular distance so as to be spaced apart from each other along a longitudinal direction of the platform and may face each other. Each of the lift driving units 10 that form a pair may include a post constituting a main body. Each of the posts may be erected on the platform in the vertical direction and be formed to have a predetermined height. A driving mechanism for moving each of the movement bodies 20 of the opposite sides thereof in the vertical direction may be provided inside of each post. The driving mechanism may be applied in various configurations such as a combination of a chain and sprocket with a motor, and a combination of a cylinder or screw jack with a motor.

[0016] The ropes 30 are coated with a rubber or synthetic resin material on an outer side thereof to prevent decay, as well as to minimize injury when colliding with a passenger.

[0017] The rope interval maintenance unit 100 connects the ropes 30 to each other in the vertical direction to secure the vertical interval of the ropes 30, thereby serving to prevent the ropes 30 from being deformed by a passenger who holds the rope 30 to twist the rope 30 or widen the interval between the ropes 30.

[0018] Referring to FIGS. 5 to 8, such a rope interval maintenance unit 100 includes: a fixing part 110 provided to fix the ropes 30 to each other in the vertical direction; a first buffer part 120 fixing a rope at the lowest position of the ropes 30 to a lower part of the fixing part 110 to be able to perform a buffer function in an event of colliding with a passenger or an obstacle; and a second buffer part 130 fixing a rope at the highest position of the ropes 30 to an upper part of the fixing part 110 to be able to

perform the buffer function in the event of colliding with a passenger or an obstacle.

[0019] The fixing part 110 is provided with a pair thereof positioned in the front and rear of the ropes 30 and the pair is firmly fastened to each other by fasteners 112 such as bolts and nuts, so that, excluding the uppermost and lowermost ropes among the ropes 30, the remaining ropes positioned therebetween are pressed, thereby preventing deformation in which the ropes 30 are twisted by an external force or the interval between the ropes 30 is widened, thereby being able to maintain the vertical interval constant. The pair of fixing parts 110 may be provided with a pressure groove 111 into which the ropes 30 are inserted. Such a pair of fixing parts 110 may be provided in a bar shape by using a hard material such as a synthetic resin material.

[0020] As shown in FIG. 4, since the pair of fixing parts 110 connects the ropes 30 to each other in the vertical direction to secure the vertical interval of the ropes 30, tension of the remaining ropes is maintained even when some of the ropes are cut among the ropes 30, so as to be able to continue to block or allow the passage of the passenger.

[0021] The first buffer part 120 and the second buffer part 130 perform the buffer function in the event when the ropes 30 moving in the vertical direction collide with a passenger or an obstacle, thereby preventing the injury or damage from occurring. As shown in FIGS. 9 and 10, the first buffer part 120 and the second buffer part 130 may include buffer spaces 121 and 131 each inside of the first buffer part 120 and the second buffer part 130 each provided with the lowermost and uppermost ropes among the ropes 30 passing in the horizontal direction and formed to cushion a collision in the vertical direction in the event of colliding with a passenger or an obstacle. That is, the buffer spaces 121 and 131 are each provided with a certain space so that the lowermost and uppermost ropes 30 may be shaken in the vertical direction without fixing the lowermost and uppermost ropes 30, thereby performing the buffer function in the event of colliding with a passenger or an obstacle while the ropes are moving.

[0022] The first buffer part 120 and the second buffer part 130 are configured to entirely surround the outer diameters of the lowermost and uppermost ropes 30 respectively, and are made of a soft material, thereby minimizing injury caused by an event of colliding with a passenger.

Claims

1. A safety device for an electric locomotive platform, the safety device comprising: at least one pair or more of lift driving units (10) provided at a selected position between an entrance of the platform to which an electric locomotive enters and an exit of the platform; movement bodies (20) provided on opposite sides of ropes and each moved in an up-and-down direction by each of the pair of the lift driving units (10); a plurality of ropes (30) disposed at an interval therebetween so as to be spaced apart from each other in the up-and-down direction between the pair of the lift driving units (10), and connecting the movement bodies (20) on the opposite sides of the ropes to each other in a horizontal direction; and a rope interval maintenance unit (100) securing each interval of the plurality of ropes (30) by connecting the plurality of ropes (30) to each other in a vertical direction so as to suppress the plurality of ropes (30) from being deformed by an external force and suppress each interval of the plurality of ropes (30) from being changed.

2. The safety device of claim 1, wherein the rope interval maintenance unit (100) comprises: a fixing part (110) provided to fix the plurality of ropes (30) to each other in the vertical direction; a first buffer part (120) fixing a rope provided at a lowest position of the ropes (30) to a lower part of the fixing part (110) to be able to perform a buffer function in an event of colliding with a passenger or an obstacle; and a second buffer part (130) fixing a rope provided at a highest position of the ropes (30) to an upper part of the fixing part (110) to be able to perform a buffer function in an event of colliding with a passenger or an obstacle.

3. The safety device of claim 2, wherein the first buffer part (120) and the second buffer part (130) respectively have buffer spaces (121 and 131) therein through which, among the plurality of ropes (30), the lowermost and uppermost ropes pass in the horizontal direction, the buffer spaces being formed to cushion a collision in the vertical direction in the event of colliding with a passenger or an obstacle.

4. The safety device of claim 2, wherein the fixing part (110) is formed of a hard material, and the first buffer part (120) and the second buffer part (130) are formed of a soft material.

FIG. 1

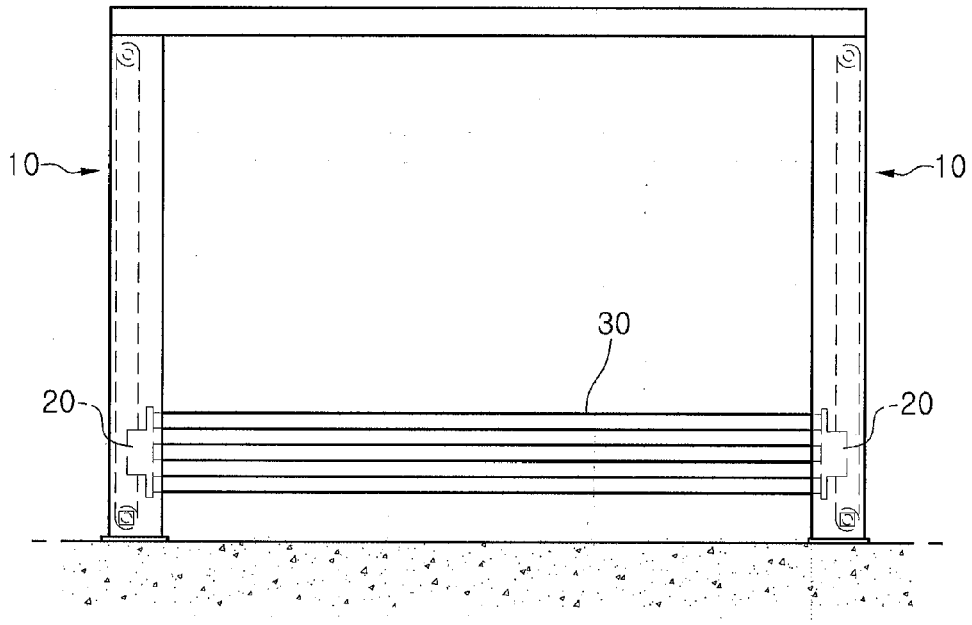


FIG. 2

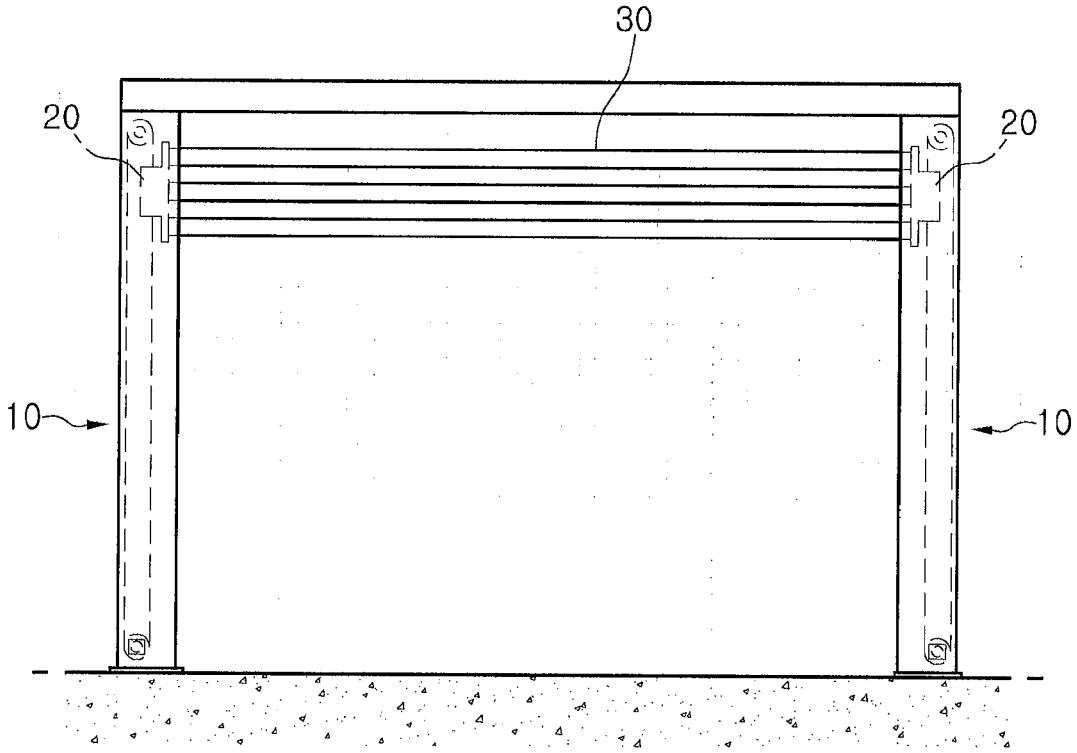


FIG. 3

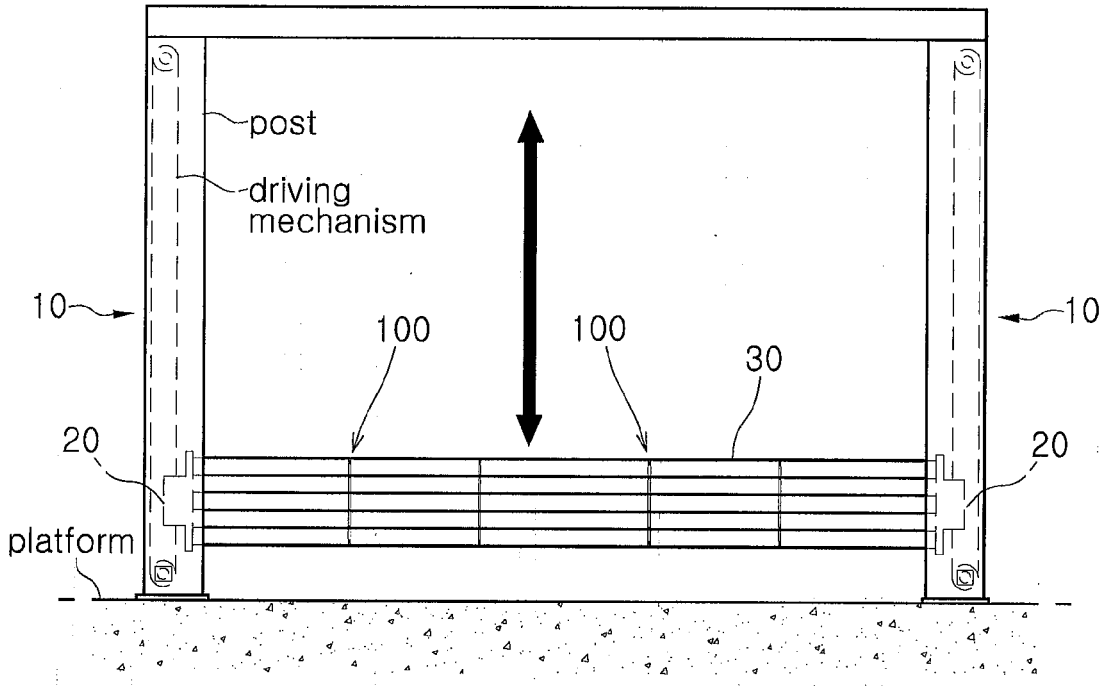

post
driving mechanism
10
100
100
30
10
20
20
platform

FIG. 4

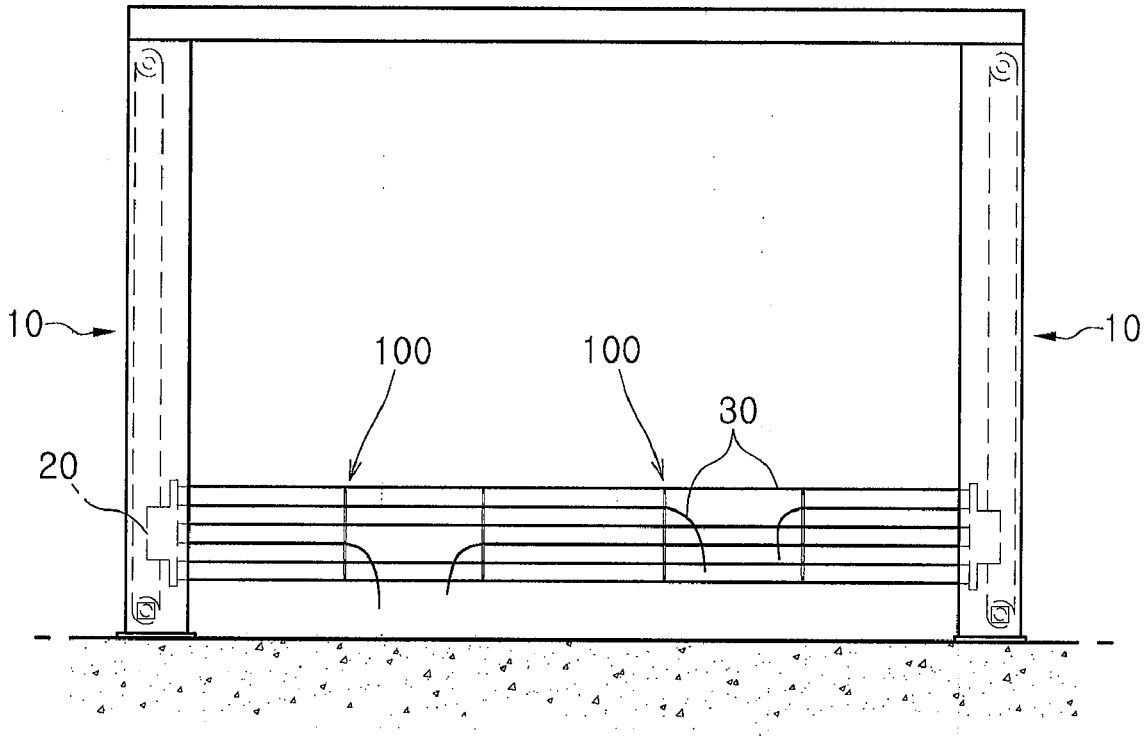

10
100
100
30
10
20

FIG. 5

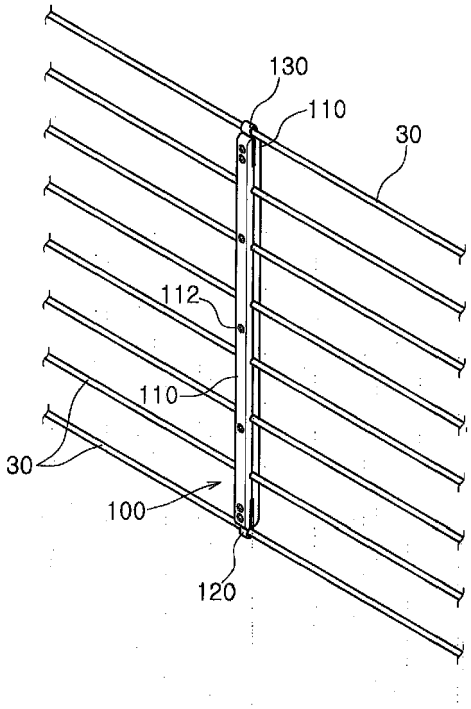


FIG. 6

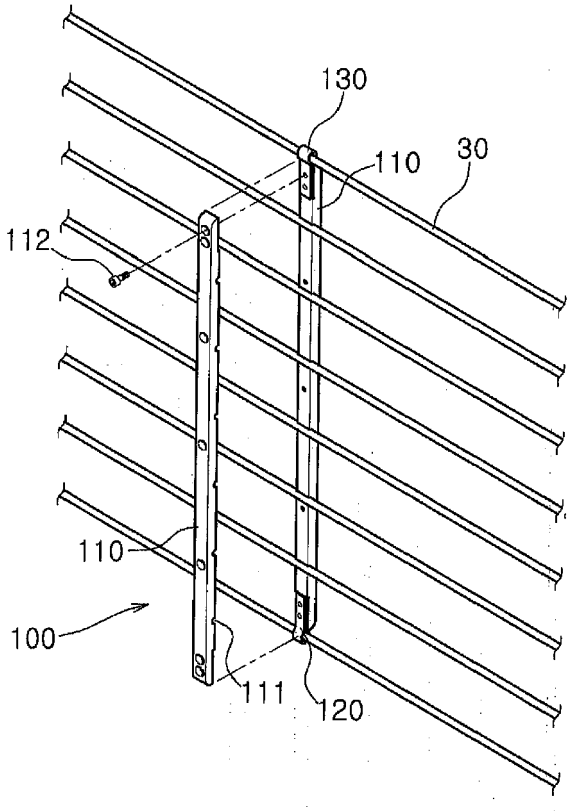


FIG. 7

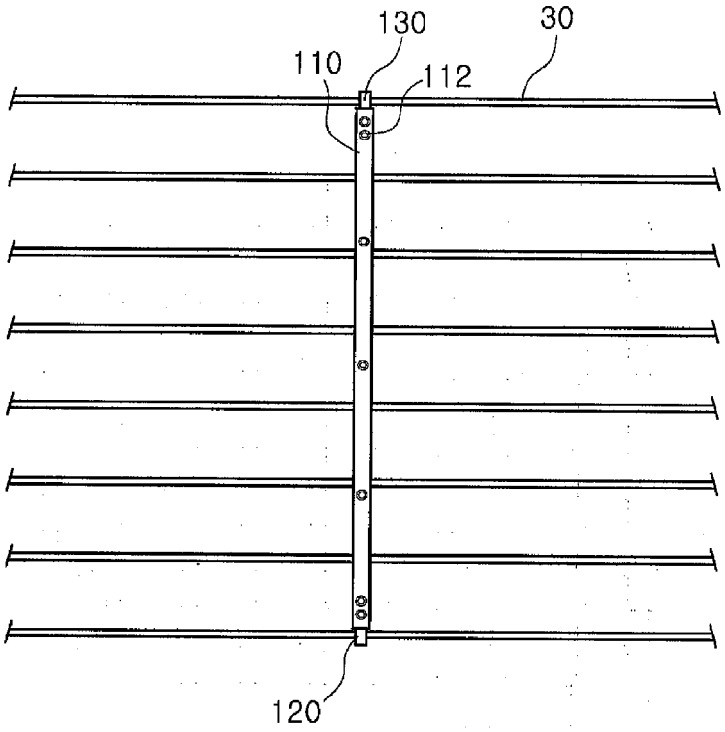


FIG. 8

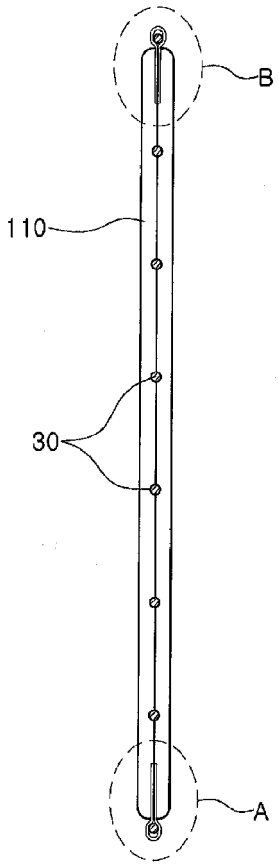


FIG. 9

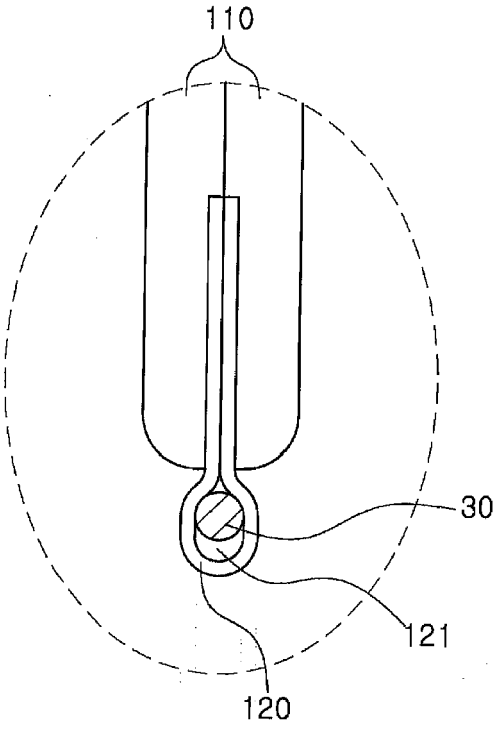
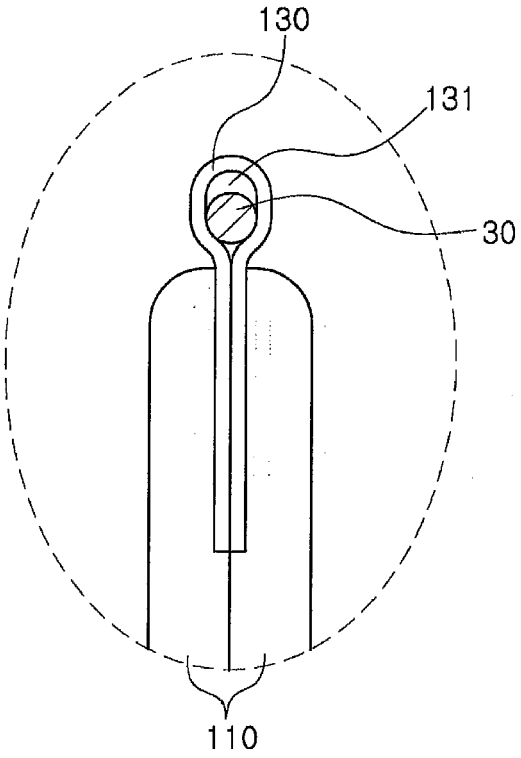


FIG. 10



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EUROPEAN SEARCH REPORT

Application Number
EP 20 20 9147

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	WO 2013/133631 A1 (KOREA TRANSP INST [KR]) 12 September 2013 (2013-09-12) * figures 1, 5, 9, 14 *	1	
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			B61B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	7 May 2021	Denis, Marco

CATEGORY OF CITED DOCUMENTS

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

REFERENCES CITED IN THE DESCRIPTION

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