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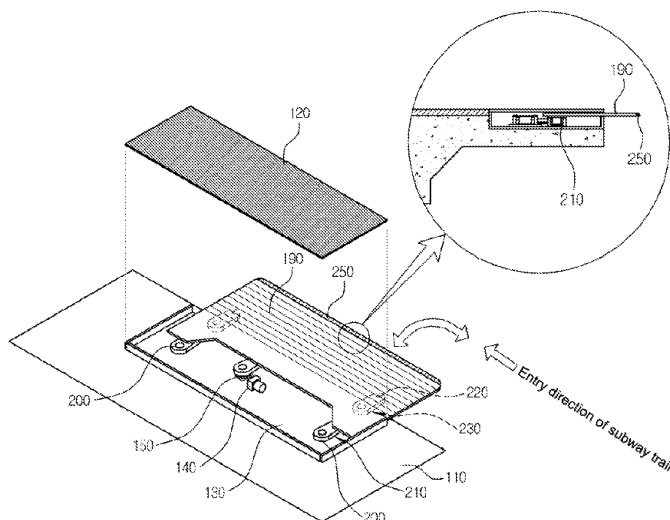
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(54) **SAFETY FOOTHOLD FOR SUBWAY PLATFORM**

(57) The present invention relates to a safety foothold for a subway platform. The opening/closing type safety foothold installed inside a platform is able to fill the gap between a subway train and the platform, so that passenger's feet are prevented from falling into the gap. Fur-

thermore, accidents caused by collision of the safety foothold due to operation error thereof are prevented while the safety foothold protrudes and the subway train enters and exits a station. The manufacture and the installation of the safety foothold are easy and facilitated through a simple opening/closing structure thereof.

[Fig. 3]



Description

Technical Field

[0001] The present invention relates to a safety foothold for a subway platform in that an opening/closing type safety foothold installed inside the subway platform is able to quickly fill the gap between a subway train and the platform, in a case that it has a large gap between the subway train and the platform, whereby passenger's feet are prevented from falling into the gap. More particularly, the present invention relates to a safety foothold for a subway platform in that a driving guide arm is rotably connected to and formed on a frame, which is installed inside a subway platform, right and left at a predetermined angle through a driving motor and a driving gear, a foothold plate is rotably connected to and formed on a front end portion of the driving guide arm right and left at a predetermined angle through a hinge portion, guide arms are formed on center portions of left and right sides of the frame and rotably connected to and formed on supports formed at rear portions of left and right sides of the foothold plate, and other guide arms are formed on front portions of left and right sides of the frame and rotably connected to and formed on the foothold plate, so that an opening/closing type safety foothold installed inside the subway platform is able to fill the gap between a subway train and the platform, in a case that it has a large gap between the subway train and the platform, thus preventing the passenger's feet from falling into the gap; a driving force is stopped through a torque clutch of the driving guide arm of opening and closing the safety foothold while the safety foothold protrudes and the subway train enters and exits a station, so that the safety foothold is quickly returned to its original position, thus preventing accidents caused by collision of the safety foothold due to operation error thereof; and a manufacture and an installation of the safety foothold are easy and facilitated through a simple opening/closing structure thereof.

Background Art

[0002] In general, since it has a large gap between the subway train and the platform, passenger's feet can fall into the gap between them easily. Especially, in case of children or elderly people, who lack in his ability to cope with danger, there is a defect in that the negligent accidents can be frequently occurred.

[0003] In order to solve the problem in that passenger's feet can easily fall into the gap between the subway train and the platform as described above, as shown in FIG. 1, a fixing type rubber support 2 is formed at the platform 1, so that it can prevent the passenger's feet from falling into the gap between the subway train and the platform.

[0004] However, the above rubber support 2 is formed between the subway train and the platform at a predetermined interval so as to prevent a collision with the sub-

way train. However, in case of a curve platform, there is a problem in that it has a large gap between the subway train and the platform.

[0005] Recently, in order to solve the defects and the problems as described above, it is well known in Korean patent registration No. 10-0318334 that a foothold, which is connected to an air compressor and an air cylinder, slidably advances forward and backward when the subway train enters the platform, so that the gap between the subway train and the platform can be filled.

[0006] That is, as shown in FIG. 2, the technical components includes a foothold support 11 installed on the subway platform 10 by interposing an upper plate 12 between them, the air compressor 30 and an air hose 20 laid in the subway platform 10, the air cylinder 40 connected to the air hose 20, and the foothold 60 formed at one end portion of the air cylinder 40 through a connecting terminal 41 and installed on both rails 50, so that the foothold 60 can move forward and backward.

[0007] Therefore, when the subway train enters the platform, the air cylinder 40 connected to the air hose 20 is operated according to the operation of the air compressor 30 laid in a rear side of the subway platform 10, and then the foothold 60 moves forward along both rails 50 according to the forward movement of the connecting terminal 41 formed at one end of the air cylinder 40, so that the gap between the subway train and the platform can be filled.

[0008] However, since the foothold 60, which moves forward and backward by means of the air cylinder 40 connected to the air compressor 30 and the air hose 20, has a fixed traveling distance, in case of a curve platform, the foothold 60, which moves forward by means of the air cylinder 40, can be protruded short thereby forming the gap between the subway train and the platform. Meanwhile, where the foothold 60 is slightly protruded long, since the collision of the foothold can be occurred when the subway train enters and exits the subway platform, there is a problem in that the safety accident caused by the collision can be increased.

[0009] Moreover, in the conventional foothold for the subway platform, where the subway train enters or exits the subway platform, the subway train can be collided with the foothold due to operation error of a controller in a state that the foothold is protruded, so that the foothold is lifted up, thereby the safety accident can be occurred.

[0010] Also, since the conventional foothold for the subway platform includes the separated air compressor 30 and air hose 20 laid in the subway platform 10, the air cylinder 40 formed inside the foothold support 11, the rails 50 for moving the foothold 60, and a plurality of bearings B formed at both sides of the foothold 60, the structure thereof is very complicated. Accordingly, there are problems in that the manufacture and the installation of the foothold are difficult.

Disclosure

Technical Problem

[0011] Therefore, the present invention has been made in view of the above-mentioned problems, and an object of the present invention is to provide a safety foothold for a subway platform in that a driving guide arm is rotably connected to and formed on a frame, which is installed inside a subway platform, right and left at a predetermined angle through a driving motor and a driving gear, a foothold plate is rotably connected to and formed on a front end portion of the driving guide arm right and left at a predetermined angle through a hinge portion, guide arms are formed on center portions of left and right sides of the frame and rotably connected to and formed on supports formed at rear portions of left and right sides of the foothold plate, and other guide arms are formed on front portions of left and right sides of the frame and rotably connected to and formed on the foothold plate, so that an opening/closing type safety foothold installed inside the subway platform is able to fill the gap between a subway train and the platform, in a case that it has a large gap between the subway train and the platform, thus preventing the passenger's feet from falling into the gap; a driving force is stopped through a torque clutch of the driving guide arm of opening and closing the safety foothold while the safety foothold protrudes and the subway train enters and exits a station, so that the safety foothold is quickly returned to its original position, thus preventing accidents caused by collision of the safety foothold due to operation error thereof; and a manufacture and an installation of the safety foothold are easy and facilitated through a simple opening/closing structure thereof.

Technical solution

[0012] In accordance with the present invention to achieve the objects thereof, there is provided a safety foothold for a subway platform comprising: a frame installed inside a subway platform by interposing an upper plate between them; a driving guide arm rotably connected to and installed on the frame right and left at a predetermined angle through a driving motor and a driving gear; a foothold plate rotably connected to and installed on a front end portion of the driving guide arm right and left at a predetermined angle through a hinge portion; first rotation guiding portions having a guide arm installed on center portions of left and right sides of the frame and rotably connected to and installed on supports formed at rear portions of left and right sides of the foothold plate; and second rotation guiding portions having other guide arm installed on front portions of left and right sides of the frame and rotably connected to and installed on the foothold plate.

[0013] Preferably, the driving guide arm rotably connected to and installed on the frame through the driving

motor comprises a driven gear formed on a lower portion thereof and interlocked with the driving gear installed on the driving motor, thereby allowing the front end portion of the driving guide arm to be rotated right and left.

[0014] Preferably, a torque clutch is mounted on an upper portion of the driven gear of the driving guide arm.

[0015] Preferably, an elastic body is integrally with a front end portion of the foothold plate so as to be contacted with a subway train.

Advantageous Effects

[0016] The present invention as described above has advantageous effects in that a driving guide arm is rotably connected to and formed on the frame, which is installed inside a subway platform, right and left at a predetermined angle through a driving motor and a driving gear, a foothold plate is rotably connected to and formed on a front end portion of the driving guide arm right and left at a predetermined angle through a hinge portion, guide arms are formed on center portions of left and right sides of the frame and rotably connected to and formed on supports formed at rear portions of left and right sides of the foothold plate, and other guide arms are formed on front portions of left and right sides of the frame and rotably connected to and formed on the foothold plate, so that an opening/closing type safety foothold installed inside the subway platform is able to fill the gap between a subway train and the platform, in a case that it has a large gap between the subway train and the platform, thus preventing the passenger's feet from falling into the gap; a driving force is stopped through a torque clutch of the driving guide arm of opening and closing the safety foothold while the safety foothold protrudes and the subway train enters and exits a station, so that the safety foothold is quickly returned to its original position, thus preventing accidents caused by collision of the safety foothold due to operation error thereof; and a manufacture and an installation of the safety foothold are easy and facilitated through a simple opening/closing structure thereof.

Brief Description of the Drawings

[0017] The foregoing and other objects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view illustrating a conventional rubber support formed at a subway platform;
FIG. 2 is a schematic front sectional view illustrating a conventional foothold for a subway platform;
FIG. 3 is an exploded perspective view illustrating a safety foothold for a subway platform in accordance with the present invention;
FIG. 4 is a perspective view illustrating an operating

status of a safety foothold for a subway platform in accordance with the present invention;
 FIG. 5 is a perspective view illustrating a principal part of a safety foothold for a subway platform in accordance with the present invention; and
 FIG. 6 is a perspective view illustrating an installing status of a safety foothold for a subway platform in accordance with the present invention.

Best Mode

Mode for Invention

[0018] Hereinafter, exemplary embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0019] FIG. 3 is an exploded perspective view illustrating a safety foothold for a subway platform in accordance with the present invention, FIG. 4 is a perspective view illustrating an operating status of a safety foothold for a subway platform in accordance with the present invention, FIG. 5 is a perspective view illustrating a principal part of a safety foothold for a subway platform in accordance with the present invention, and FIG. 6 is a perspective view illustrating an installing status of a safety foothold for a subway platform in accordance with the present invention.

[0020] Referring to the drawings, the safety foothold for the subway platform in accordance with the present invention includes a frame 130 installed inside a subway platform 110 by interposing an upper plate 120 between them and a driving guide arm 160 rotably connected to and installed on the frame 130 right and left at a predetermined angle through a driving motor 140 and a driving gear 150.

[0021] Also, the safety foothold for the subway platform in accordance with the present invention further includes a foothold plate 190 rotably connected to and installed on a front end portion of the driving guide arm 160 right and left at a predetermined angle through a hinge portion 180 and first rotation guiding portions 210 having a guide arm 200 installed on center portions of left and right sides of the frame 130 and rotably connected to and installed on supports 191 formed at rear portions of left and right sides of the foothold plate 190.

[0022] Moreover, the safety foothold for the subway platform in accordance with the present invention further includes second rotation guiding portions 230 having other guide arm 220 installed on front portions of left and right sides of the frame 130 and rotably connected to and installed on the foothold plate 190.

[0023] Additionally, a torque clutch 240 is mounted on an upper portion of the driven gear 170 of the driving guide arm 160 and an elastic body 250 is integrally with a front end portion of the foothold plate 190 so as to be contacted with a subway train T.

[0024] Hereinafter, the action and effects of the safety foothold for the subway platform in accordance with the

present invention having the above constructions will be described in detail with reference to the accompanying drawings.

[0025] As shown in FIG. 3 through FIG. 6, the frame 130 is installed inside the subway platform 110 by interposing the upper plate 120 between the frame 130 and the subway platform 110. At this time, the driving guide arm 160 is rotably connected to and installed on the frame 130 right and left at a predetermined angle by interposing the driving motor 140 and the driving gear 150 between them, so that the driven gear 170, which is integrally formed on the lower portion of the driving guide arm 160, is interlocked with the driving gear 150 of driving motor 140 according to the operation of the driving motor 140 and the driving gear 150 when the subway train enters the subway platform 110, thereby allowing the front end portion of the driving guide arm 160 to be rotated right and left.

[0026] At this time, the foothold plate 190 is rotably connected to and installed on the front end portion of the driving guide arm 160 right and left at a predetermined angle through a hinge portion 180, so that the foothold plate 190 is protruded to outside through the rotation of the driving guide arm 160 while being rotated to the frame 130 at a predetermined angle, thereby allowing the foothold plate 190 to be contacted with the subway train T.

[0027] Also, simultaneously with the rotation of the driving guide arm 160, the guide arms 200 installed on the center portions of left and right sides of the frame 130 are rotated at a predetermined angle. At this time, since the guide arms 200 are rotably connected to and installed on the supports 191 formed at the rear portions of left and right sides of the foothold plate 190, the guide arms 200 sever to support and guide the rear portions of left and right sides of the foothold plate 190 in such a manner that the foothold plate 190 can be protruded to outside and received therein.

[0028] Continuously, since other guide arms 220, which are installed on the front portions of left and right sides of the frame 130, are rotably connected to and installed on the foothold plate 190, simultaneously with the rotation of the driving guide arm 160, the front end portions of other guide arms 220 are rotated at a predetermined angle, so that other guide arms 220 sever to support and guide the center portions of the left and right sides of the foothold plate 190 in such a manner that the foothold plate 190 can be protruded to outside and received therein.

[0029] Especially, the elastic body 250, which is made from a rubber, is integrally with the front end portion of the foothold plate 190, so that it can serve to safely protect the foothold plate 190 when the foothold plate 190 is contacted with the subway train T.

[0030] Also, since the torque clutch is mounted on the upper portion of the driven gear 170 of the driving guide arm 160, when the safety foothold is protruded to outside due to operation error thereof, the controlling signals is transmitted to the torque clutch 240 according to a big

torque applied to the foothold plate 190 during the entry or starting of the subway train, so that the operation of the driving motor 140 is stopped and the foothold plate 190 is rotated inside the frame 130, thereby automatically accommodating the foothold plate 190 therein. Accordingly, it can prevent accidents caused by collision of the safety foothold.

[0031] Also, the foothold plate 190 is formed at the subway platform 110 in the drawing. However, the foothold plate 190 can be formed at a lower portion of a subway door.

Industrial Applicability

[0032] As can be seen from the foregoing, the safety foothold for the subway platform according to the present invention has advantageous effects in that the opening/closing type safety foothold installed inside the subway platform is able to fill the gap between the subway train and the platform, in a case that it has a large gap between the subway train and the platform, thus preventing the passenger's feet from falling into the gap; a driving force is stopped through a torque clutch of the driving guide arm of opening and closing the safety foothold while the safety foothold protrudes and the subway train enters and exits a station, so that the safety foothold is quickly returned to its original position, thus preventing accidents caused by collision of the safety foothold due to operation error thereof; and a manufacture and an installation of the safety foothold are easy and facilitated through a simple opening/closing structure thereof.

[0033] Although several exemplary embodiments of the present invention have been described for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A safety foothold for a subway platform comprising:

a frame 130 installed inside a subway platform 110 by interposing an upper plate 120 between them;

a driving guide arm 160 rotably connected to and installed on the frame 130 right and left at a predetermined angle through a driving motor 140 and a driving gear 150;

a foothold plate 190 rotably connected to and installed on a front end portion of the driving guide arm 160 right and left at a predetermined angle through a hinge portion 180;

first rotation guiding portions 210 having a guide arm 200 installed on center portions of left and right sides of the frame 130 and rotably connected to and installed on supports 191 formed at

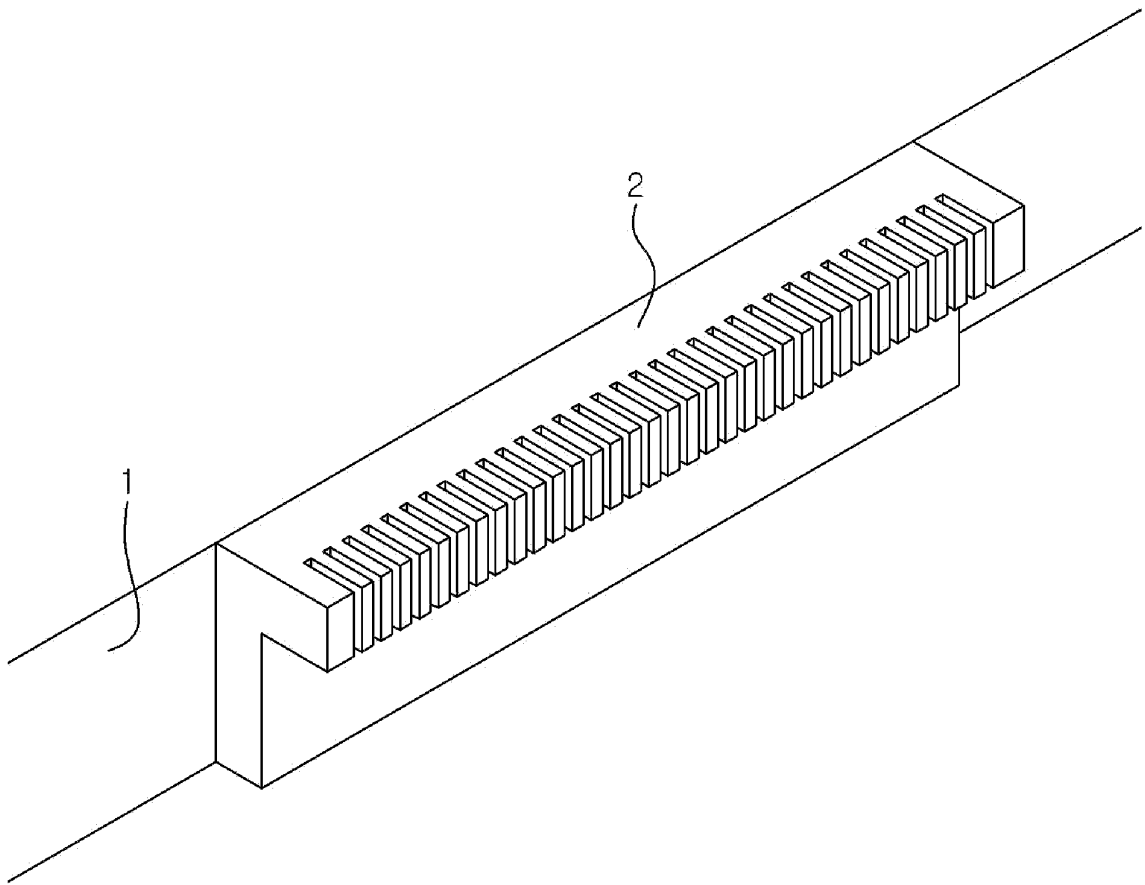
rear portions of left and right sides of the foothold plate 190; and
second rotation guiding portions 230 having other guide arm 220 installed on front portions of left and right sides of the frame 130 and rotably connected to and installed on the foothold plate 190.

2. The safety foothold for a subway platform as recited in claim 1, wherein the driving guide arm 160 rotably connected to and installed on the frame 130 through the driving motor comprises a driven gear 170 formed on a lower portion thereof and interlocked with the driving gear 150 installed on the driving motor 140, thereby allowing the front end portion of the driving guide arm 160 to be rotated right and left.

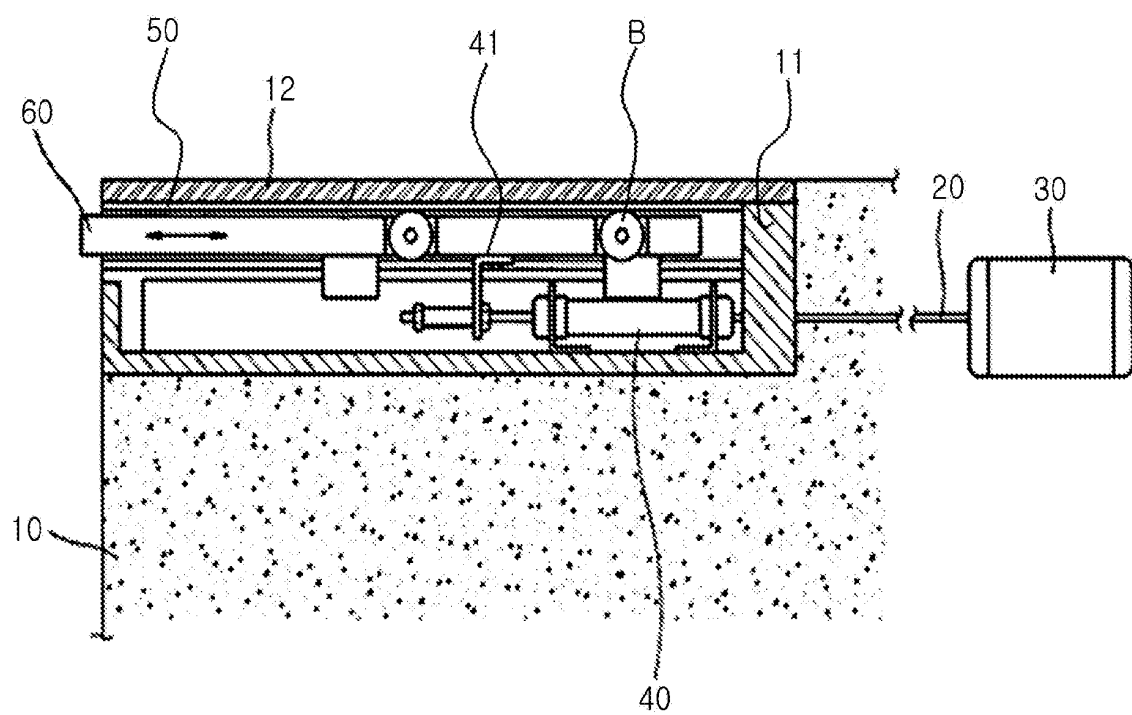
3. The safety foothold for a subway platform as recited in claim 1, wherein a torque clutch is mounted on an upper portion of the driven gear 170 of the driving guide arm 160.

4. The safety foothold for a subway platform as recited in claim 1, wherein an elastic body 250 is integrally with a front end portion of the foothold plate 190 so as to be contacted with a subway train T.

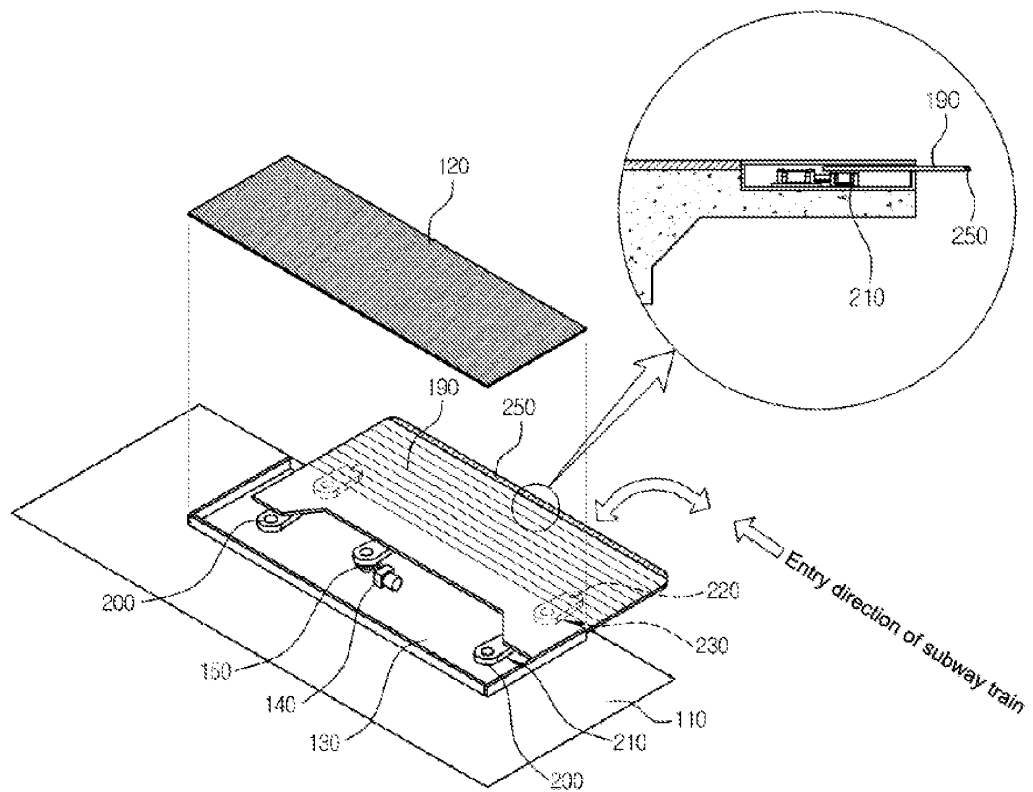
[Fig. 1]



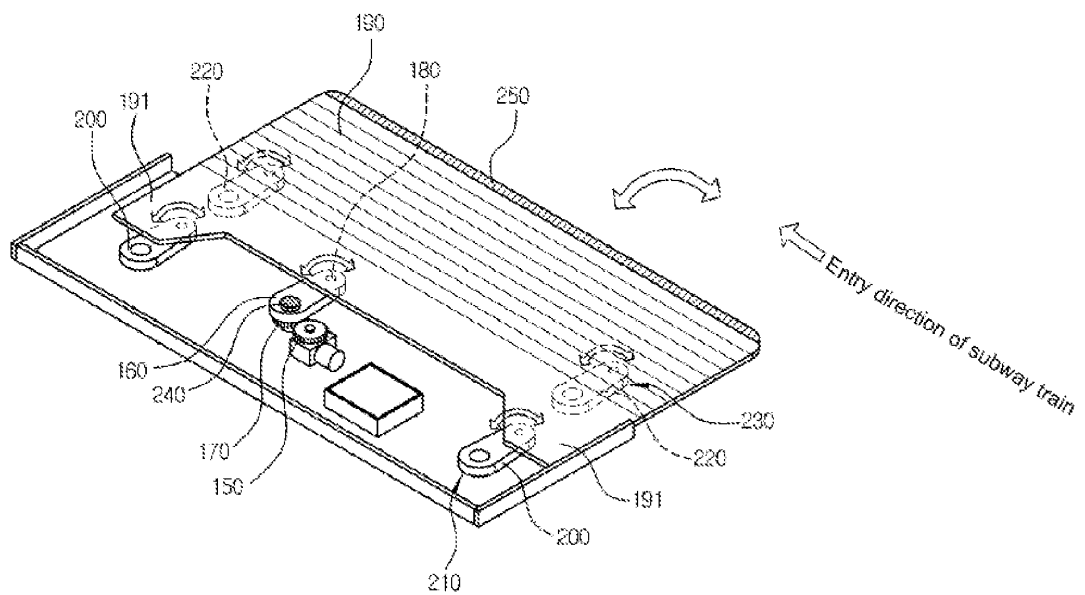
[Fig. 2]



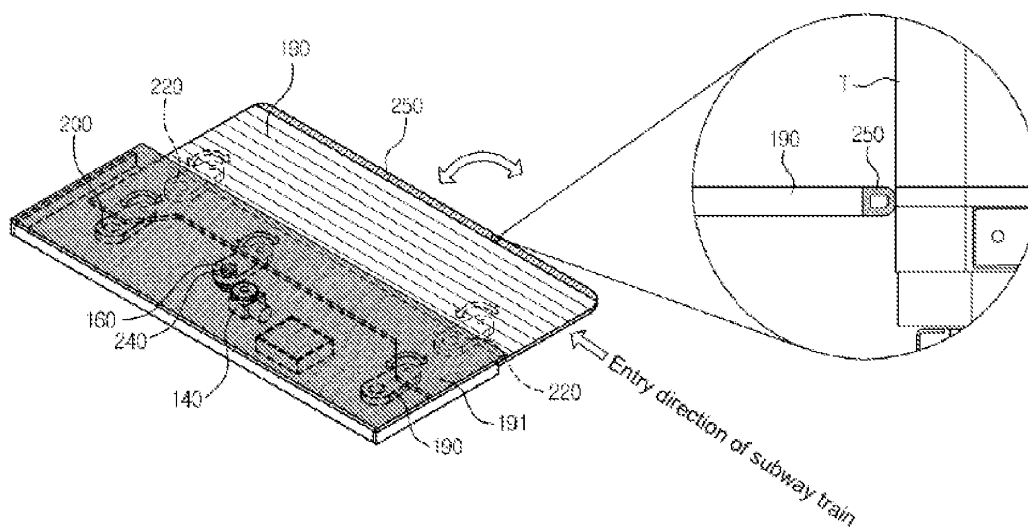
[Fig. 3]



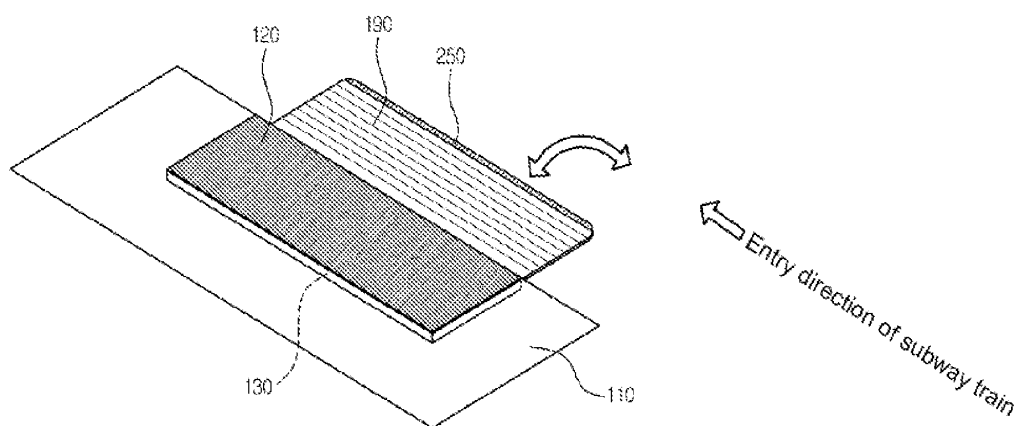
[Fig. 4]



[Fig. 5]



[Fig. 6]



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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