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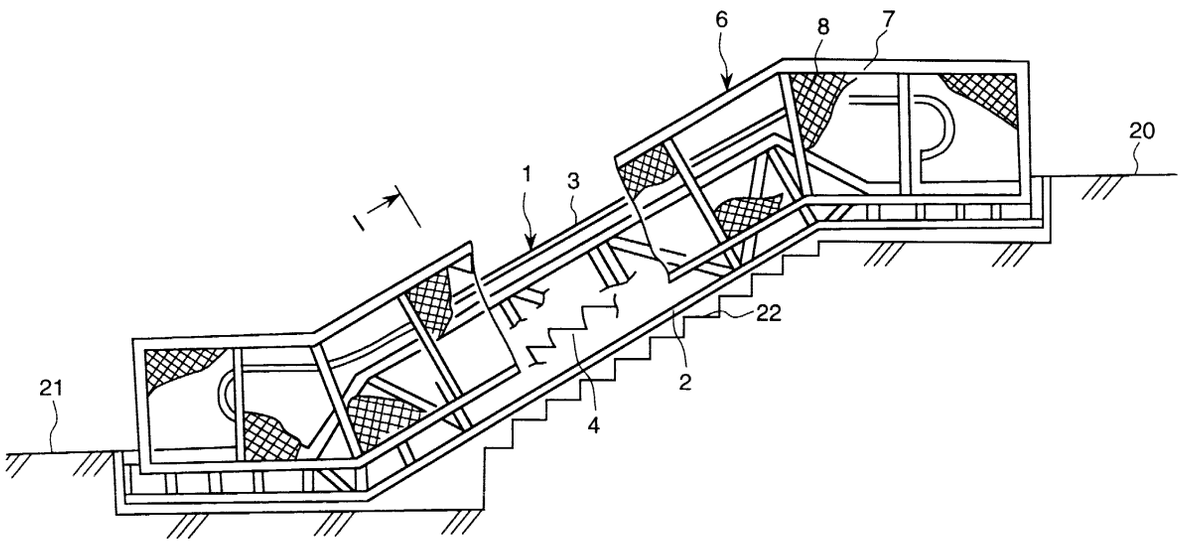
(54) Working method and protection system for passenger conveyer

(57) In order to perform curing of the passenger conveyer without the specifically used leg bodies to be set up on the floor surface, a frame of the passenger conveyer supports a curing system for covering a working position when the passenger conveyer is being installed or repaired.

FIG. 1



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Description

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] The present invention relates to a working method for a passenger conveyer such as an escalator, a moving sidewalk and the like, and a curing system for a passenger conveyer used during installing or repairing the passenger conveyer.

BACKGROUND OF THE INVENTION

[0002] When a passenger conveyer, for example, an escalator is installed or an installed escalator is repaired, a curing system including sheets and panels has been arranged so as to surround the escalator in order to protect pedestrians around there from danger.

[0003] The conventional curing system of this kind is composed of, for example, a plurality of leg bodies capable of being set up on a floor surface where the escalator is to be installed, and the sheets and the panels described above which are fixed to the leg bodies in order to perform curing of the escalator.

[0004] Therefore, the conventional curing system has a problem in that a large amount of curing members is required, the whole curing structure is complex and large, and the handling at transporting and managing is complicated. Further, there is a problem in that an additional area is required around the installation area because the leg bodies are set up on the floor near the installation area of the escalator, and accordingly the area occupied by the escalator during installing or repairing becomes so large as to restrict the pedestrian zone.

SUMMARY OF THE INVENTION

[0005] An object of the present invention is to provide a working method for a passenger conveyer and a curing system for a passenger conveyer by which curing of the passenger conveyer can be performed without leg bodies specifically used for curing and to be set up on a floor surface where the escalator is to be installed.

[0006] In order to attain the above-mentioned object, in the present invention, a frame of a passenger conveyer supports a curing system for covering a working position when the passenger conveyer is being installed or repaired.

[0007] By doing so, the working position of the passenger conveyer can be covered to perform desired curing without the specifically used leg bodies to be set up on the floor surface. Further, since the specifically used leg bodies are unnecessary, number of the members and installation area for the curing part can be reduced, the structure can be simplified, and the area around the passenger conveyer can be kept relatively wider.

BRIEF DESCRIPTION OF DRAWINGS

[0008] FIG. 1 is a side view showing a first embodiment of a curing system for a passenger conveyer in accordance with the present invention.

[0009] FIG. 2 is an enlarged cross-sectional view showing the I-portion of FIG. 1.

[0010] FIG. 3 is a view showing the state that the curing system shown in FIG. 2 is attached to a frame composing the main body of the passenger conveyer.

[0011] FIG. 4 is a side view showing a second embodiment in accordance with the present invention.

[0012] FIG. 5 is an enlarged cross-sectional view showing the II-portion of FIG. 4.

[0013] FIG. 6 is a cross-sectional view showing a main portion of a third embodiment in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] An embodiment of a curing system for a passenger conveyer in accordance with the present invention will be described below, referring to FIG. 1 to FIG. 3.

[0015] In the first embodiment shown in FIG. 1 to FIG. 3, the curing system 6 composing the first embodiment is arranged so as to cover over the whole side area in one side of the passenger conveyer, for example, the escalator to be cured.

[0016] The escalator 1 comprises a frame 2 forming the main body rising up, for example, to a position of a balustrade 3, steps 4, hand rails 5 and so on. There are an upper floor 20 and a lower floor 21 in a building where the escalator 1 is to be installed, and there is a staircase 22 between the upper floor 20 and the lower floor 21. That is, the escalator 1 is an escalator which is installed on one side of the staircase 22, for example, an escalator installed in a railway station.

[0017] The curing system 6 covering the whole side area in one side portion of the escalator comprises a frame body 7; a sheet-shaped body, for example, a net body 8 attached to the frame body 7; and projecting parts 9, 10 by which the frame body 7 is fixed to, for example, the frame 2 of the escalator 1. Holes 11, 12 provided in the projecting parts 9, 10 are fit to holes 13, 14 provided in the frame 2, respectively, and the curing system 6 is supported by the escalator 1 by inserting a bolt 15 into the holes 11, 13 and a bolt 16 into the holes 12, 14 and fastening the bolts 15, 16.

[0018] A holding means for holding the curing system 6 to the passenger conveyer 1 itself, that is, a fixing means for fixing the curing system 6 to the frame 2 composing the main body of the escalator 1 is composed of the projecting parts 9, 10; the holes 11, 12 in the projecting parts 9, 10; the holes 13, 14 formed in the frame 2; and the bolts 15, 16.

[0019] During installation work or repairing work of the escalator 1, the first embodiment constructed as de-

scribed above restricts equipment, machines, work tools to project from the outside of the escalator 1, and accordingly it is possible to protect the environment around the escalator 1. Therefore, during the installation work or the repairing work, it is possible to secure the safety and the protection to pedestrians walking, for example, on the staircase 22.

[0020] Particularly, the curing system 6 can be formed in a simple structure with less number of members since the leg bodies need not to be set up on the floor surface of the upper floor 20, the floor surface of the lower floor 21 and the staircase 22. Further, it is possible to reduce the total volume of the curing system by the amount of the leg bodies, and it is easy to handle the curing system in transportation and management. Furthermore, the area around the escalator 1 can be kept relatively wider, and the restriction to the pedestrian zone can be moderated.

[0021] Although the first embodiment described above comprises the holes 11, 12 in the frame 2, the holes 13, 14 formed in the frame 2 and bolts 15, 16 as the fixing means for fixing the curing system 6 to the frame 2, the curing system 6 may be fixed to the frame 2 by welding the projecting parts 9, 10 to the frame 2 without providing the holes 11, 12, 13, 14 and the bolts 15, 16.

[0022] Further, number of the projecting parts 9, 10 in the frame body 7 may be appropriately determined depending on necessity.

[0023] Furthermore, although the first embodiment described above basically comprises only the curing system 6, a lighting fixture, a ventilation unit and so on may be added.

[0024] A second embodiment in accordance with the present invention will be describe below, referring to FIG. 4 and FIG. 5.

[0025] In the second embodiment, the passenger conveyer to be cured is also an escalator 1 installed on a staircase 22 arranged between an upper floor 20 and a lower floor 21 in a building, similarly to the first embodiment described above, and the second embodiment has a curing system 30 covering over the whole side area in one side of the escalator 1.

[0026] The curing system 30 comprises a frame body 31, plate-shaped bodies, that is, panels 32 having solidity to be attached to the frame body 31, and extension parts 39 extending the panels 32 up to near a ceiling part 23 of a building.

[0027] As shown in FIG. 5, the curing system comprises projecting parts 33, 34 in the frame body 31, holes 35, 36 provided in the projecting parts 33, 34, holes formed in the frame 2 so as to fit to the holes 35, 36 and bolts 37, 38 to be inserted into the corresponding holes.

[0028] A holding means for holding the curing system 30 to the passenger conveyer 1 itself, that is, a fixing means for fixing the curing system 30 to the frame 2 composing the main body of the escalator 1 is composed of the projecting parts 33, 34 in the frame body 31; the holes 35, 36 and so on; and the bolts 37, 38.

[0029] The second embodiment constructed as described above can also perform curing of the escalator 1 without any leg bodies to be set up on the upper floor 20, the lower floor 21 and the staircase 22, and has the operation and the effects similar to those of the first embodiment described above. Particularly in the second embodiment, since the extension parts 39 of the curing system 30 cover the wider range extending up to near a ceiling part 23 of a building, it is possible to more certainly protect the environment around the escalator 1 during installation work or repairing work of the escalator 1. Therefore, it is possible to more certainly secure the safety and the protection to pedestrians walking on the staircase 22.

[0030] FIG. 6 shows a third embodiment in accordance with the present invention. In the third embodiment, the frame body 31 comprises a hook-shaped hooking part 41 as well as the projecting part 33. A hole 35 is formed in the projecting part 33, and a hole fit to the hole 35 is formed at the corresponding position in the frame 2. A bolt 37 is inserted into the hole 35 and the hole. Further, a hook-shaped hooking part 40 for hooking the above-mentioned hooking part 41 is provided in the frame 2. The other structures are similar to those in the second embodiment described above.

[0031] The above-mentioned hooking part 41 in the frame body 31 and the hooking part 40 in the frame 2 compose a holding means for holding the curing system 30 to the escalator 1 itself, that is, a hooking means for hooking the curing system 30 to the frame 2.

[0032] When the curing system 30 is attached to the escalator 1 in the third embodiment, the hooking part 41 in the frame body 31 is initially hooked to the hooking part 40 in the frame 2, and the hole 35 of the projecting part 33 in the frame body 31 is fit to the hole formed in the frame 2, and then the bolt 37 is inserted the hole 35 and the hole and fastened.

[0033] Similarly to the second embodiment, the third embodiment constructed as described above can also perform curing of the escalator 1 without any leg bodies to be set up on the upper floor 20, the lower floor 21 and the staircase 22, and has the operation and the effects similar to those of the second embodiment described above. Particularly in the third embodiment, since the bolt 37 is fastened, for example, by hand work after hooking the hooking part 41 in the frame body 31 to the hooking part 40 in the frame 2, manpower of the fastening work using the bolts can be reduced. Therefore, the attaching work of the curing system 30 can be efficiently performed.

[0034] The third embodiment has the projecting part 33, and the projecting part 33 is fastened to the frame 2 through the bolt 37. However, it is also possible to employ the structure that a hooking part similar to the hooking part 41 is provided instead of the projecting part 33, and a hooking part to be hooked with the hooking part is provided in the frame 2.

[0035] In each of the above-mentioned embodiments, the curing system 6 or 30 is arranged so as to cover over the whole side area in one side of the escalator 1. The present invention is not limited that the curing system 6 or 30 is arranged in such a manner. For example, the curing system may be arranged so as to cover a part, for example, a half of the a side area in one side of the escalator 1, or may be arranged so as to cover over the whole side area in both side of the escalator 1, or may be arranged so as to cover over the landings in the upper and the lower floors of the escalator 1, if necessary.

[0036] In each of the above-mentioned embodiments, the escalator 1 is taken as an example of the passenger conveyer to be cured. However, the escalator 1 may be a generally used escalator, or may be a recently developed thin escalator of which the total height is lower than that of the general escalator by 20 to 30 %. Further, the curing system may be employed for a moving sidewalk instead of the escalator 1.

[0037] Each of the above-mentioned embodiments has described on the curing system. The procedure of attaching the above-mentioned curing system will be described below.

[0038] For example, in a case where the passenger conveyer is installed in a staircase in a railway station, as the first step performed during a time slot when passengers are not in the railway station, civil work is performed to excavate an installation place such as part of the upper and the lower floors and the staircase where the passenger conveyer is to be installed. After completion of the excavation work, a simple fence or cover is put up around the working zone so as to prevent the passengers in the railway station from entering in there. As the second step during the time slot when passengers are not in the railway station, the passenger conveyer is brought in to be temporarily installed in the excavated portion. After the temporary installation work, as the third step the curing system is held with the frame of the passenger conveyer to surround the working zone. In this state, as the fourth step, assembling of the remaining parts of the passenger conveyer and accurate positioning of the passenger conveyer are performed. Further, after the fourth step, the fifth step is performed to remove the curing system and to attach the exterior features of the passenger conveyer. Thus, the installation of the passenger conveyer is completed.

[0039] The work from the first step to the fifth step described above is a procedure for newly installing a passenger conveyer. However, when a passenger conveyer already installed is repaired or modified, the curing system described above is not always necessary to be supported with the frame of the passenger conveyer and the curing system may be supported using the balustrade or the like.

[0040] Further, in each of the above-mentioned embodiments, the total weight of the curing system described above is completely supported by the passenger conveyer side. However, when the curing system is huge, the curing system may be set up on the floors in the upper and the lower floors and on the staircase where the passenger conveyer is installed. Thereby, the weight of the curing system is sustained by the floors and the staircase, and the passenger conveyer side only prevents the set-up curing system from falling down.

[0041] As having been described above, according to the present invention, curing of the passenger conveyer can be performed without the specifically used leg bodies to be set up on the floor surface, number of the members for the curing system can be reduced compared to the conventional curing system, and the structure of the curing system can be simplified. Thereby, the manufacturing cost can be reduced. Further, the total volume of the curing system can be reduced compared to that of the conventional curing system by the amount of eliminating the leg bodies, and the handling at transporting and managing can be easily performed. Furthermore, the area around the passenger conveyer can be kept wider compared to the conventional curing system, and accordingly the restrictions to the pedestrian zone and so on can be moderated.

Claims

1. A working method for a passenger conveyer characterized by that a frame of the passenger conveyer supports a curing system for covering a working position when the passenger conveyer is being installed or repaired.

2. A working method for a passenger conveyer characterized by that a constituent member of the passenger conveyer supports a curing system for covering a working position when the passenger conveyer is being installed or repaired.

3. A working method for a passenger conveyer characterized by that a constituent member of the passenger conveyer prevents a curing system for covering a working position from falling down when the passenger conveyer is being installed or repaired.

4. A passenger conveyer comprising a constituent member having a supporting portion for supporting a curing system for covering a working position during construction working.

5. A working method for a passenger conveyer when the passenger conveyer is installed in a staircase in a railway station, the method comprising the steps of:

   excavating an installation place for installing a frame of the passenger conveyer;
   installing said frame in the excavated portion after excavating the installation place;

supporting a curing system with said frame after installing said frame;
assembling the passenger conveyer after the supporting the curing system; and
removing said curing system and attaching exterior features of the passenger conveyer after assembling the passenger conveyer.

6. A curing system for a passenger conveyer comprising a curing system for covering at least a part of a side portion of the passenger conveyer, which comprises a holding means for holding said curing system to said passenger conveyer itself.

7. A curing system for a passenger conveyer according to claim 6, wherein said holding means comprises a fixing means for fixing said curing system to a frame composing the main body of said passenger conveyer.

8. A curing system for a passenger conveyer according to any one of claim 6 and claim 7, wherein said holding means comprises an attaching means for attaching said curing system to a frame composing the main body of said passenger conveyer.

9. A curing system for a passenger conveyer according to any one of claim 6 to claim 8, wherein said curing system comprises an extension part extending up to near a ceiling part of a building.

10. A curing system for a passenger conveyer according to any one of claim 6 to claim 9, wherein said passenger conveyer is an escalator.

FIG. 1

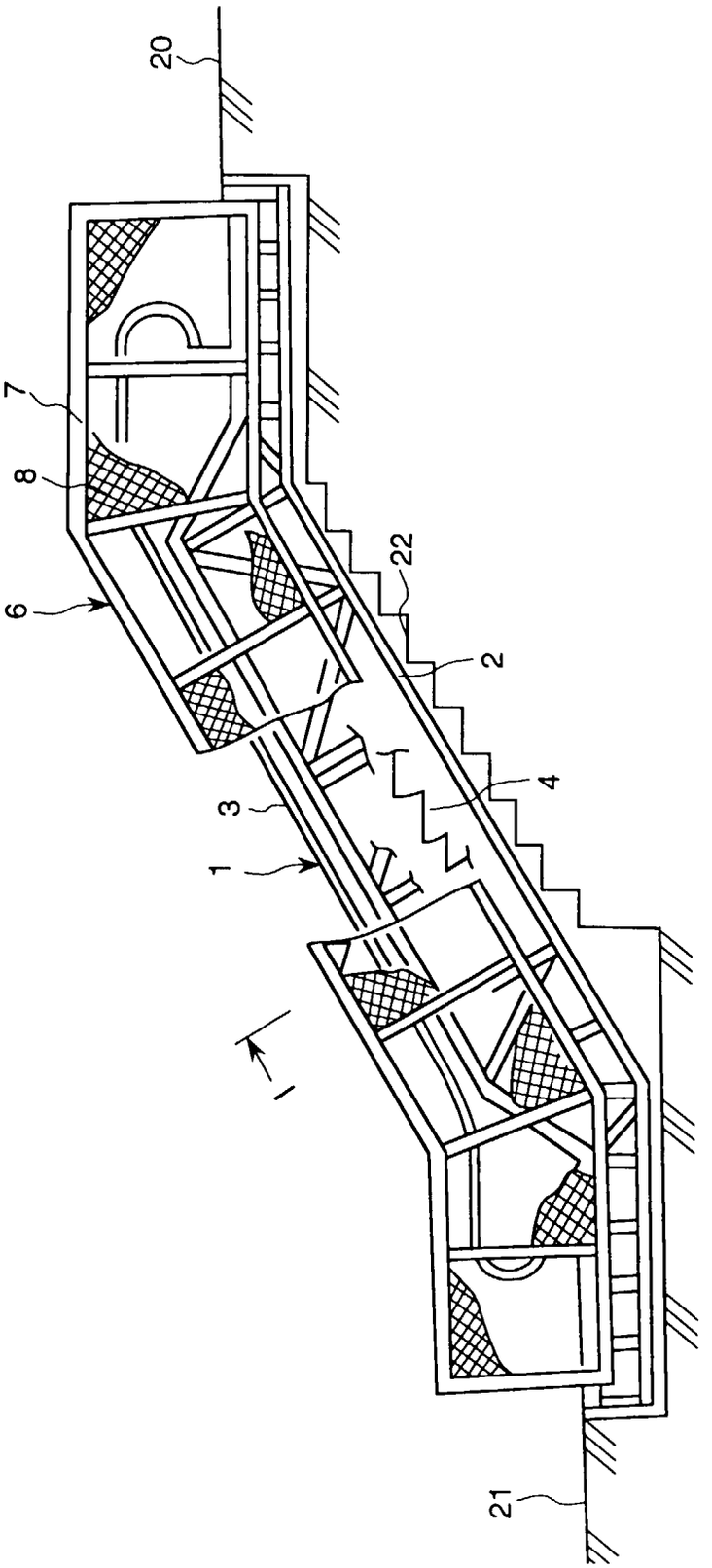

FIG. 2

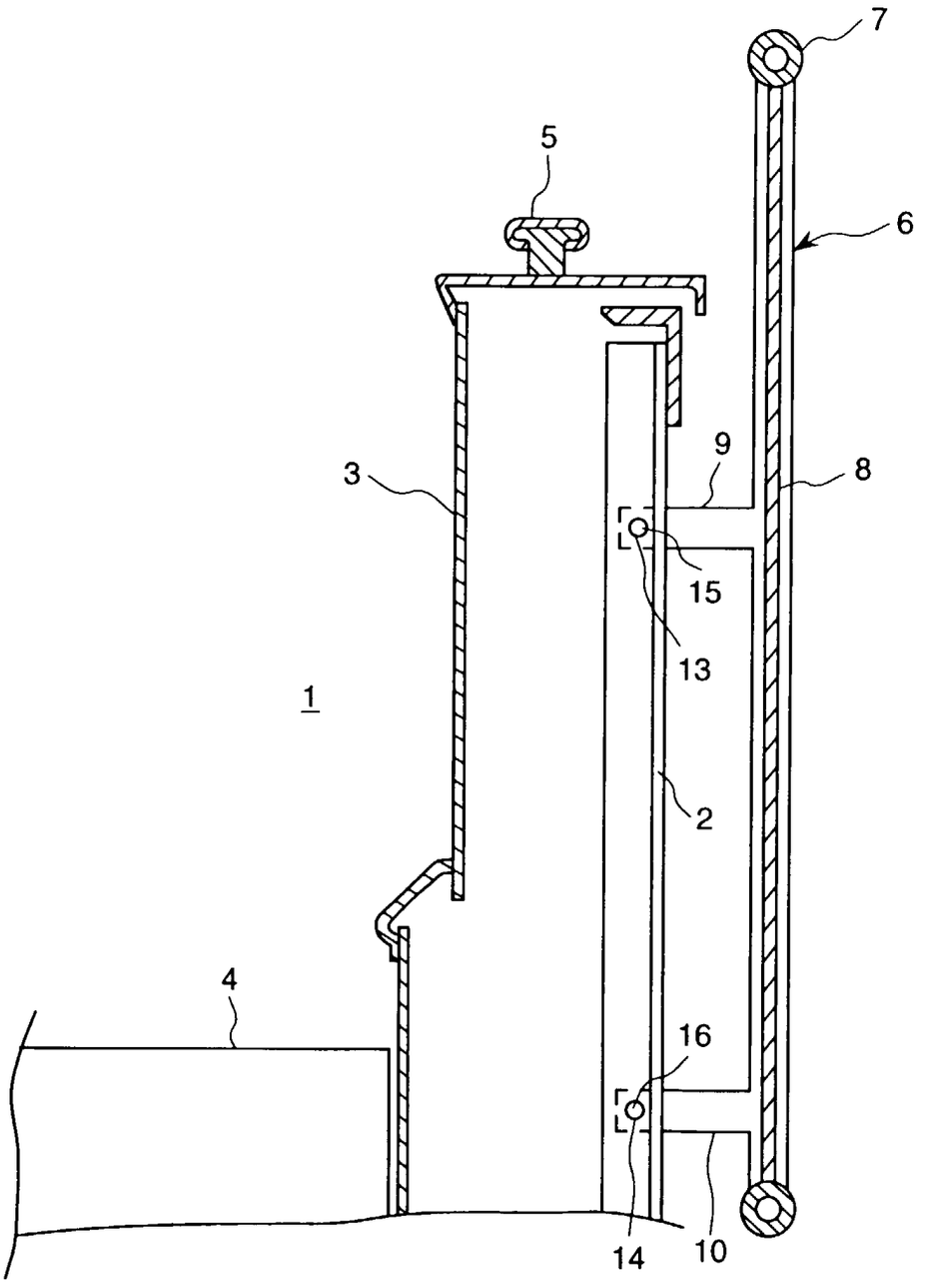

FIG. 3

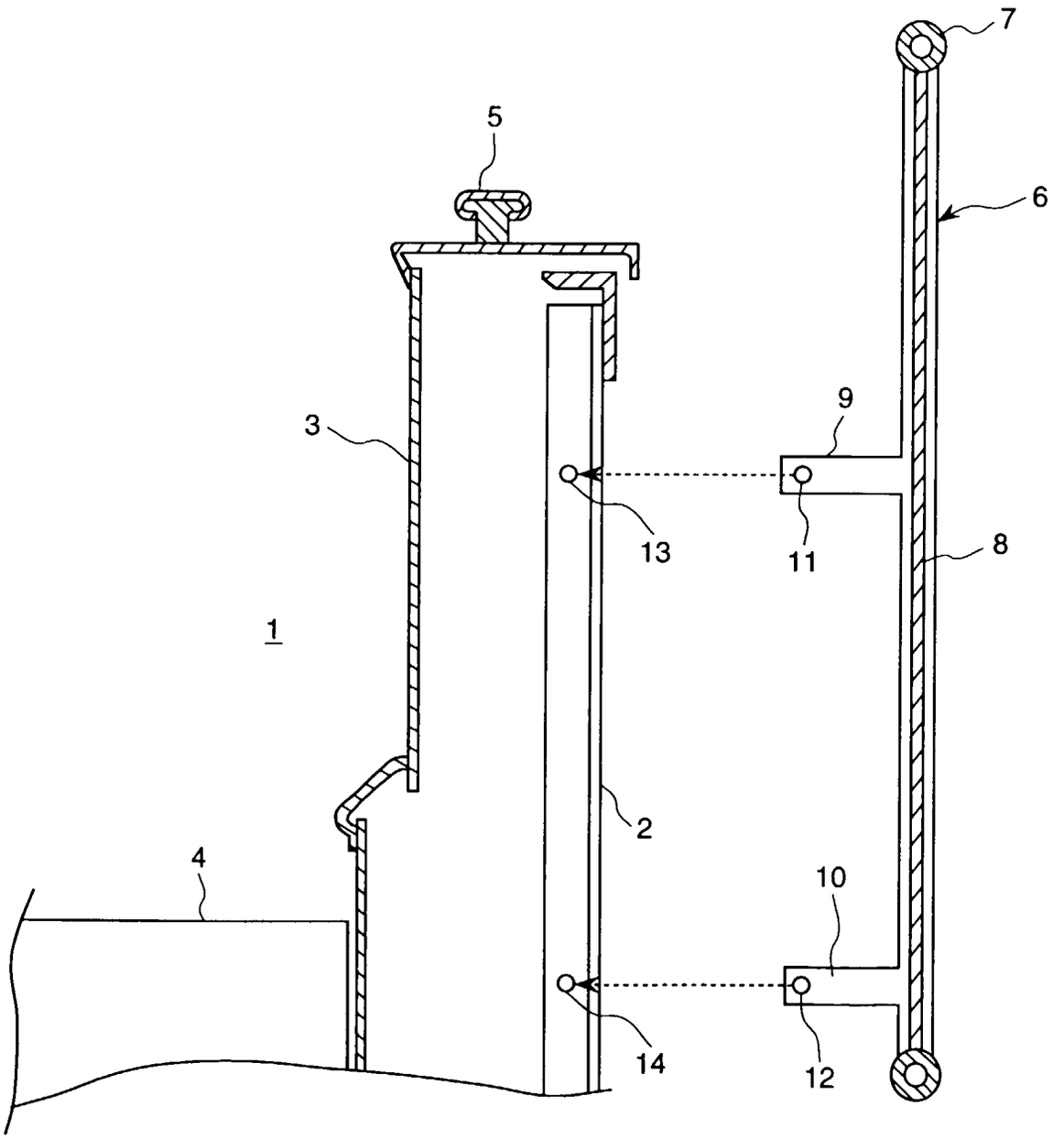

FIG. 4

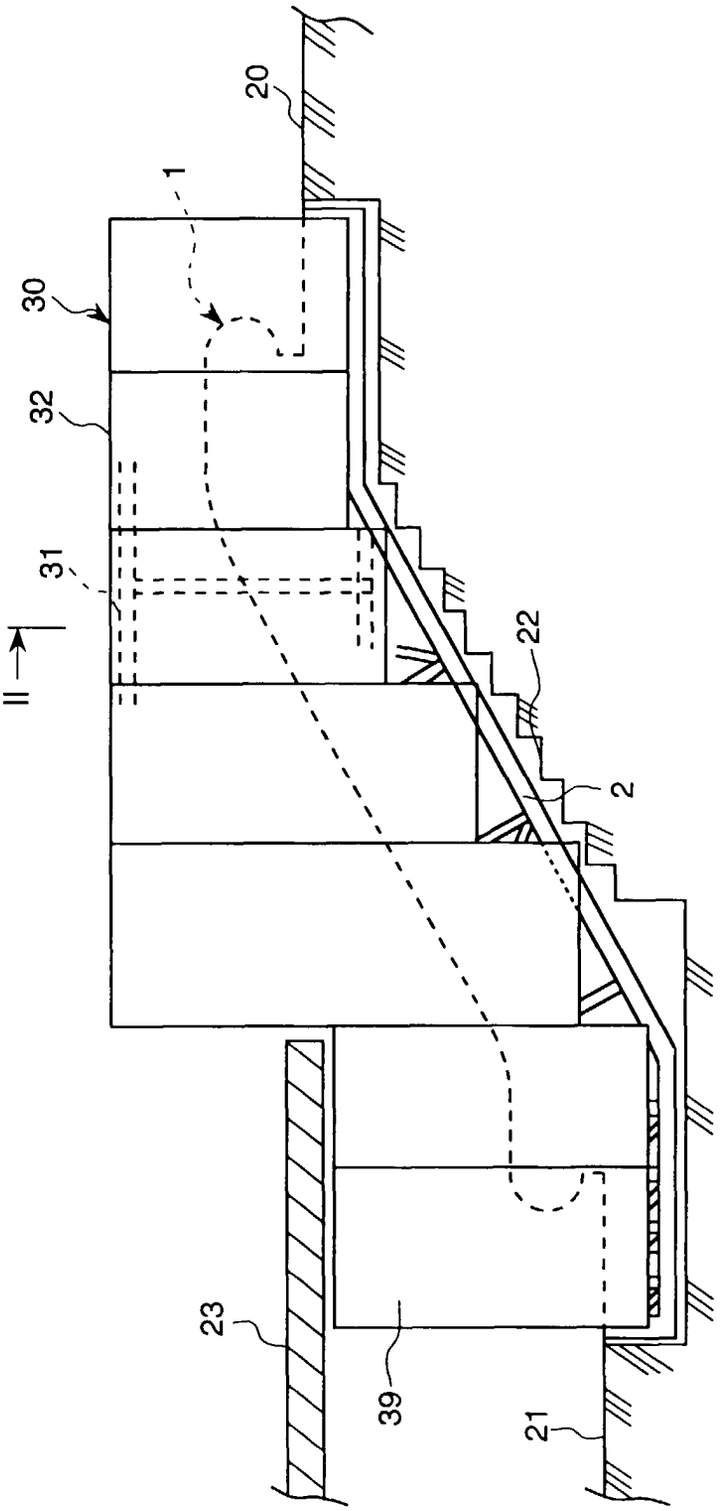

FIG. 5

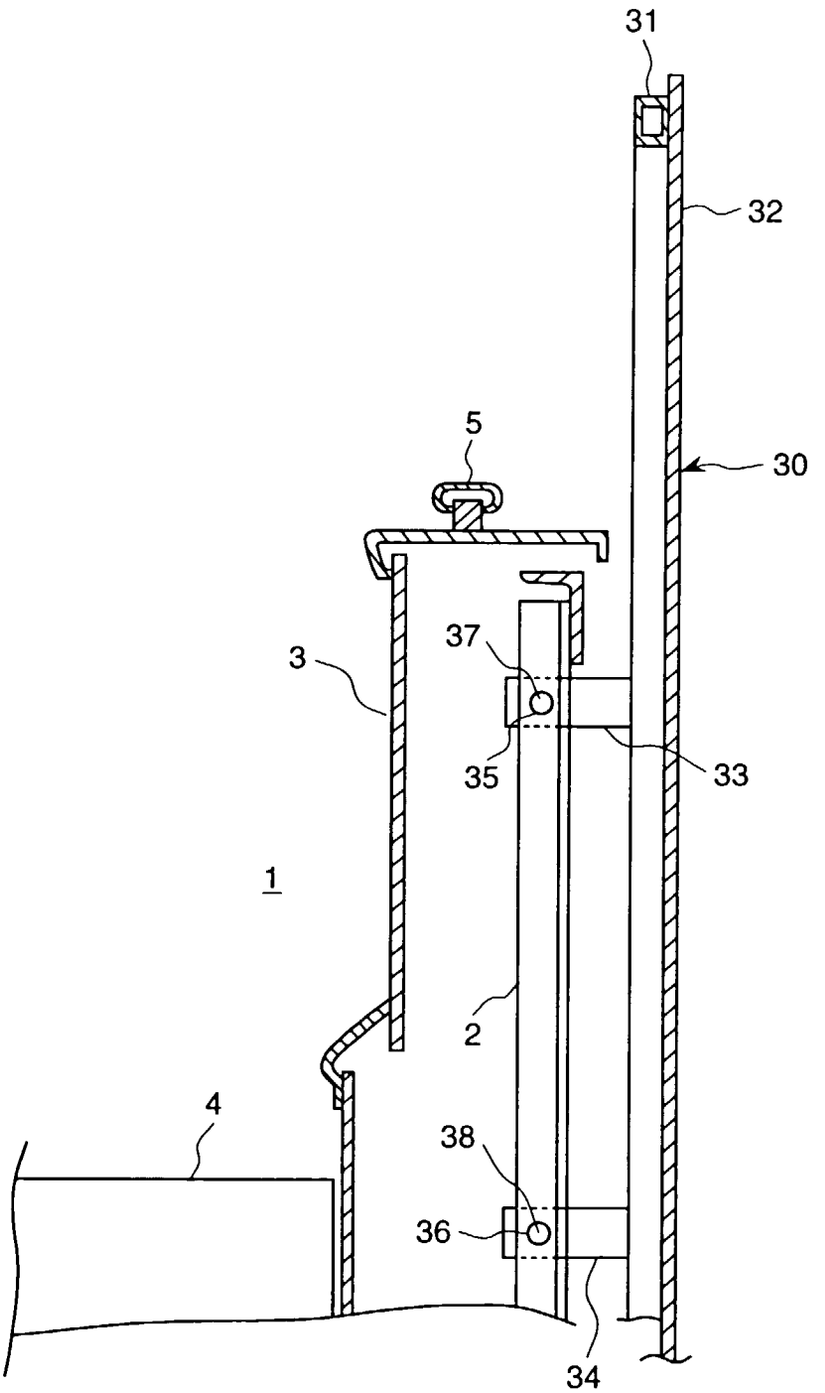

FIG. 6