DESCRIPTION

Title of Invention: PASSENGER BOARDING BRIDGE

Technical Field

[0001] The present disclosure relates to a passenger boarding bridge.

Background Art

[0002] At an airport, there are cases where a passenger boarding bridge that connects a terminal building and an aircraft is used for boarding onto and disembarking from the aircraft.

[0003] The passenger boarding bridge includes: a rotunda connected to an entrance of the terminal building; a tunnel unit with its proximal end connected to the rotunda, the tunnel unit being extendable and retractable; and a cab (a head) provided at the distal end of the tunnel unit, the cab being connected to the aircraft.

[0004] The tunnel unit includes a plurality of tunnels that are fitted together in a nested manner, and the tunnel unit is configured such that its overall length can be extended and shortened in a front-rear direction (longitudinal direction). This enables the tunnel unit to appropriately accommodate changes in a distance between the terminal building and the aircraft. Floor members of the tunnels form a passenger walkway between the entrance of the terminal building of the airport and an entrance of the aircraft. Conventionally, various proposals have been made regarding the floor members.

[0005] For example, Patent Literature 1 discloses a floor configuration in which a floor member of an inner tunnel includes an inclined floor that has a predetermined gradient and that decreases in height toward an outer tunnel, and a ramp that is swingable in an up-down direction is provided at the distal end portion of the inclined floor on the outer-tunnel side.

Citation List

Patent Literature

[0006] PTL 1: Japanese Laid-Open Patent Application Publication No. 2003-291896

Summary of Invention

Technical Problem

[0007] One aspect of the present disclosure aims, as one example, to provide a passenger boarding bridge that makes it possible to maintain an inclined floor in a more stable orientation than in the conventional art while reducing the gradient of a floor member that forms a walkway of a tunnel.

Solution to Problem

[0008] One aspect of the present disclosure is a passenger boarding bridge including: a tunnel unit including a plurality of tunnels that are fitted together in a nested manner, the tunnel unit being extendable and retractable in a front-rear direction; a first floor member that forms a walkway of an outer tunnel of the tunnels that are adjacent to each other; and a second floor member that forms a walkway of an inner tunnel of the tunnels that are adjacent to each other. The second floor member is configured to slide on a main surface of the first floor member in accordance with extension and retraction of the tunnel unit. The first floor member includes a first fixed floor and a first inclined floor, the first fixed floor being provided parallel to the front-rear direction, the first inclined floor extending from an end of the first fixed floor and being inclined downward. The second floor member includes a second fixed floor and a second inclined floor, the second fixed floor being provided parallel to the front-rear direction, the second inclined floor extending from an end of the second fixed floor and being inclined downward. The second floor member is provided with a support member that supports the second inclined floor on the main surface of the first floor member. At least a portion of the second inclined floor is configured as a first swingable portion that is rotatable relative to the second fixed floor side of the second inclined floor about a first shaft extending in a width direction of the second inclined floor, and a distal-end-side portion of the first swingable portion is configured as a second swingable portion that is rotatable relative to a proximal portion of the first swingable portion about a second shaft extending in a width direction of the first swingable portion.

Advantageous Effects of Invention

[0009] The passenger boarding bridge of the one aspect of the present disclosure provides an advantage of making it possible to maintain an inclined floor in a more stable orientation than in the conventional art while reducing the gradient of a floor member that forms a walkway of a tunnel.

Brief Description of Drawings

[0010] FIG. 1 shows one example of a passenger boarding bridge of one embodiment.

FIG. 2 shows one example of floor members forming walkways of adjacent inner and outer tunnels of the passenger boarding bridge of the embodiment.

FIGS. 3A and 3B are each an enlarged view of floor members in a dashed-line frame

DF1 of FIG. 2.

FIGS. 4A and 4B are each an enlarged view of floor members in a dashed-line frame DF2 of FIG. 2.

FIG. 5 is a diagram for describing a suitable arrangement position of a support member that supports an upper inclined floor on a main surface of a lower floor member.

Description of Embodiments

[0011] Conventionally, a floor member of a tunnel of a tunnel unit often includes a fixed floor and an inclined floor. The fixed floor is provided parallel to a front-rear direction in which the tunnel unit extends and retracts. The inclined floor is hinge-connected to the distal end of the fixed floor. The floor member is required to have a thickness sufficient to ensure desired stiffness of the floor member. In this respect, there is a problem in that, as the thickness of the floor member increases, the gradient of the inclined floor becomes steeper in order to eliminate a step resulting from such thickness. Consequently, this may hinder, for example, passage of a wheelchair or the like on the inclined floor from an outer tunnel toward an inner tunnel.

[0012] In view of the above, the inventors of the present disclosure conducted diligent studies on the floor member that forms a tunnel walkway regarding reduction of the gradient of the inclined floor that is intended to eliminate the step formed between the inner and outer tunnels that are adjacent to each other. As a result of the studies, they obtained the following findings.

[0013] First, by increasing the slope length of, and reducing the thickness of, the inclined floor of the inner tunnel, which is one of the adjacent inner and outer tunnels, the gradient of the inclined floor can be reduced. In this case, however, if the inclined floor is supported only by the hinge-connection portion of the inclined floor and the distal end of the inclined floor, reducing the thickness of the inclined floor may result in insufficient stiffness of the inclined floor. For this reason, it is desirable to provide, at a suitable position in the longitudinal direction of the inclined floor of the inner tunnel, a support member that supports the inclined floor of the inner tunnel on a main surface of the floor member of the outer tunnel.

[0014] Incidentally, in accordance with airport spot layouts, not only a two-stage-type passenger boarding bridge including two tunnels but also a passenger boarding bridge including three or more tunnels is commonly adopted.

[0015] With respect to a passenger boarding bridge including three or more tunnels, it has been found that, when the overall length of the tunnel unit is shortened and the inclined floors of

adjacent inner and outer tunnels overlap each other in an up-down direction, the orientation of the inclined floor of the inner tunnel becomes unstable.

[0016] The inventors of the present disclosure have conducted diligent studies, and as a result of the studies, they have found that, in the aforementioned overlapping orientation of the inclined floors, as the inclination starting point of the outer tunnel approaches the support member, the distal end of the inclined floor of the inner tunnel may lift away from the main surface of the inclined floor of the outer tunnel. Based on this finding, the inventors of the present disclosure have arrived at one aspect of the present disclosure described below.

[0017] Further, as a result of the diligent studies, the inventors of the present disclosure have found that, when the overlap between the inclined floors further progresses, the support member provided on the inclined floor of the inner tunnel may lift away from the main surface of the inclined floor of the outer tunnel. Based on this finding, the inventors of the present disclosure have arrived at one aspect of the present disclosure described below.

[0018] Specifically, a passenger boarding bridge of a first aspect of the present disclosure is a passenger boarding bridge including: a tunnel unit including a plurality of tunnels that are fitted together in a nested manner, the tunnel unit being extendable and retractable in a front-rear direction; a first floor member that forms a walkway of an outer tunnel of the tunnels that are adjacent to each other; and a second floor member that forms a walkway of an inner tunnel of the tunnels that are adjacent to each other. The second floor member is configured to slide on a main surface of the first floor member in accordance with extension and retraction of the tunnel unit. The first floor member includes a first fixed floor and a first inclined floor, the first fixed floor being provided parallel to the front-rear direction, the first inclined floor extending from an end of the first fixed floor and being inclined downward. The second floor member includes a second fixed floor and a second inclined floor, the second fixed floor being provided parallel to the front-rear direction, the second inclined floor extending from an end of the second fixed floor and being inclined downward. The second floor member is provided with a support member that supports the second inclined floor on the main surface of the first floor member. At least a portion of the second inclined floor is configured as a first swingable portion that is rotatable relative to the second fixed floor side of the second inclined floor about a first shaft extending in a width direction of the second inclined floor, and a distal-end-side portion of the first swingable portion is configured as a second swingable portion that is rotatable relative to a proximal portion of the first swingable portion about a second shaft extending in a width direction of the first swingable portion.

[0019] According to the above configuration, the passenger boarding bridge of the above

aspect makes it possible to maintain an inclined floor in a more stable orientation than in the conventional art while reducing the gradient of a floor member that forms a walkway of a tunnel.

[0020] Specifically, in the overlapping orientation of the first inclined floor and the second inclined floor in the up-down direction, as described above, the distal end of the second inclined floor may lift away from the main surface of the first inclined floor However, in the passenger boarding bridge of the first aspect, as a result of the distal-end-side portion of the first swingable portion of the second inclined floor rotating about the second shaft, the distal end of the second inclined floor can be suitably caused to be in contact with the main surface of the first inclined floor.

[0021] Further, in the overlapping orientation of the first inclined floor and the second inclined floor in the up-down direction, as described above, the support member provided on the second inclined floor may lift away from the main surface of the first inclined floor. However, in the passenger boarding bridge of the first aspect, as a result of the distal-end-side portion of the first swingable portion of the second inclined floor rotating about the second shaft, the support member can be suitably caused to be in contact with the main surface of the first inclined floor.

[0022] A passenger boarding bridge of a second aspect of the present disclosure may be configured such that, in the passenger boarding bridge of the first aspect, the support member is provided on the second inclined floor at a position corresponding to the second shaft or on the second inclined floor at a position between the second shaft and the first shaft.

[0023] Assume a case where the support member is provided on the second inclined floor at a position forward of the second shaft. In this case, when a passenger steps on the second shaft, in view of the balance of moments with the support member acting as a fulcrum, downward bending may occur at the second shaft. As a result, the distal end of the second inclined floor may lift away from the main surface of the first inclined floor.

[0024] In this respect, in the passenger boarding bridge of the second aspect, since the support member is provided on the second inclined floor at a position corresponding to the second shaft or on the second inclined floor at a position between the second shaft and the first shaft, the second shaft is suitably supported by the support member, and as a result, downward bending at the second shaft can be made less likely to occur. Therefore, as compared with a case where the support member is provided on the second inclined floor at a position forward of the second shaft, the passenger boarding bridge of the second aspect can reduce the likelihood of the distal end of the second inclined floor lifting away from the main surface of the first inclined floor.

[0025] A passenger boarding bridge of a third aspect of the present disclosure may be configured such that, in the passenger boarding bridge of the first or second aspect, the second shaft includes a hinge that allows the second swingable portion to swing upward and downward.

[0026] Hereinafter, one embodiment of the present disclosure is described with reference to the accompanying drawings. The embodiment described below shows specific examples of the above-described aspects of the present disclosure. Therefore, numerical values, shapes, materials, components, the arrangement and the manner of connection of the components, etc., indicated in the embodiment below are mere examples, and do not limit the above-described aspects of the present disclosure. Moreover, among the components in the embodiment below, components that are not recited in the independent claim defining the most generic concept of the present disclosure are described as optional components. In the description below, in some cases, the description of components that are denoted by the same reference signs in the drawings may be omitted. The drawings show each component schematically in order to facilitate the understanding thereof. Therefore, in some cases, the drawings may not display accurate shapes, accurate dimensional ratios, etc.

[0027] (Embodiment)

FIG. 1 shows one example of a passenger boarding bridge of one embodiment. FIG. 1 shows a portion of the overall length of a tunnel unit 10. FIG. 2 shows one example of floor members forming walkways of adjacent inner and outer tunnels of the passenger boarding bridge of the embodiment. However, in FIG. 2, in the configuration of a walkway of an outer tunnel OUT, only a main surface (upper surface) of a floor member 11 is illustrated, and the illustration of a floor configuration in a thickness direction is omitted (the same applies to FIGS. 3A, 3B and FIGS. 4A, 4B).

[0028] It should be noted that, in the present disclosure, for the sake of convenience of the following description of the configuration of a passenger boarding bridge 100, the direction in which the tunnel unit 10 extends and retracts is referred to as the front-rear direction, and the direction in which gravitational force acts on the passenger boarding bridge 100 is referred to as the up-down direction.

[0029] Further, in the following description of the configuration of the passenger boarding bridge 100, the side on which a cab 40 is positioned is defined as “front” and the side opposite the cab 40 is defined as “rear”.

[0030] As shown in FIG. 1, the passenger boarding bridge 100 includes an unshown rotunda (rear circular room), the tunnel unit 10, the cab (front circular room) 40, drive columns 30, and auxiliary stairs 16.

[0031] The rotunda is connected to an entrance of a terminal building. The tunnel unit 10 is connected to the rotunda The cab 40 is connected to the front end of a tunnel 10A of the tunnel unit 10.

[0032] The tunnel unit 10 includes an inner tunnel and an outer tunnel that are adjacent to each other. The inner and outer tunnels are fitted together such that the inner tunnel is nested in the outer tunnel. The tunnel unit 10 is configured to be extendable and retractable in the front-rear direction. Specifically, the drive columns 30 are coupled to suitable portions of the tunnel unit 10 such that the tunnel 10A of the tunnel unit 10 is sandwiched between the drive columns 30. Accordingly, when drive wheels provided at the lower end of the drive columns 30 travel on an apron 18, power for extension or retraction in the front-rear direction is transmitted to the tunnel unit 10. When the overall length of the tunnel unit 10 is extended by the transmitted power and the cab 40 reaches an entrance of an aircraft, a passenger walkway is formed between the entrance of the terminal building of the airport and the entrance of the aircraft.

[0033] An unshown operating panel is installed in the cab 40. Accordingly, an operator can perform an operation using the operating panel to control relative movement of the tunnel unit 10 in the front-rear direction. It should be noted that the passenger boarding bridge 100 may be operated not only by the operating panel in the cab 40, but also by remote equipment located outside the passenger boarding bridge 100.

[0034] The auxiliary stairs 16 are provided on the side of the tunnel unit 10 so as to connect the inside of the tunnel unit 10 and the apron 18. The installation of the auxiliary stairs 16 is optional, and the auxiliary stairs 16 are used, for example, by an operator to get in and out of the cab 40.

[0035] Next, walkways of the adjacent inner and outer tunnels in the passenger boarding bridge 100 of the present embodiment are described.

[0036] As shown in FIG. 1, the passenger boarding bridge 100 includes: the floor member 11 forming the walkway of the outer tunnel OUT, which is one of the adjacent inner and outer tunnels; and a floor member 12 forming a walkway of an inner tunnel IN, which is the other of the adjacent inner and outer tunnels.

[0037] The floor member 11 includes a fixed floor 11A and an inclined floor 11B. The fixed floor 11A is provided parallel to the front-rear direction in which the tunnel unit 10 extends and retracts. The inclined floor 11B extends from the front end of the fixed floor 11A and is inclined downward.

[0038] The floor member 12 includes a fixed floor 12A and an inclined floor 12B. The fixed floor 12A is provided parallel to the front-rear direction in which the tunnel unit 10 extends

and retracts. The inclined floor 12B extends from the front end of the fixed floor 12A and is inclined downward. A portion of the inclined floor 12B is configured as a swingable portion 12BA, which is rotatable relative to the fixed floor 12A side of the inclined floor 12B about a rotation shaft 14 extending in the width direction of the inclined floor 12B (see FIGS. 3A, 3B and FIGS. 4A, 4B). Further, a distal-end-side portion of the swingable portion 12BA is configured as a swingable portion 12BB, which is rotatable relative to a proximal portion 12BC of the swingable portion 12BA about a rotation shaft 15 extending in the width direction of the swingable portion 12BA (see FIGS. 3A, 3B and FIGS. 4A, 4B). That is, the swingable portion 12BA includes: the proximal portion 12BC excluding the distal-end-side portion of the swingable portion 12BA; and the swingable portion 12BB, which is the distal-end-side portion of the swingable portion 12BA. It should be noted that the swingable portion 12BA is one example of “a first swingable portion” of the present disclosure. Also, the swingable portion 12BB is one example of “a second swingable portion” of the present disclosure.

[0039] As a non-limiting example, the rotation shaft 14 may include a metal hinge that allows the swingable portion 12BA of the inclined floor 12B to swing upward and downward. As a non-limiting example, the rotation shaft 15 may include a metal hinge that allows the swingable portion 12BB of the inclined floor 12B to swing upward and downward. Each of the rotation shaft 14 and the rotation shaft 15 may include a suitable elastic body.

[0040] The floor member 12 is configured to slide on the main surface of the floor member 11 in accordance with extension and retraction of the tunnel unit 10. Accordingly, preferably, the distal end of the swingable portion 12BB of the floor member 12 is covered with a low-friction member having a low frictional coefficient.

[0041] Regarding the floor member 11 and the floor member 12, studies have been conducted on extending the slope length and reducing the thickness of each of the inclined floor 11B and the inclined floor 12B from the viewpoint of achieving a gradient reduction from the gradient of a conventional inclined floor (e.g., to approximately 1/30 of the gradient). For example, a conventional floor member is made of a wooden board or the like having a thickness of about 20 mm. In this respect, if each of the floor member 11 and the floor member 12 is made of a thin steel plate or the like having a thickness of 5 mm or less, the gradient of each of the inclined floor 11B and the inclined floor 12B can be reduced.

[0042] In this case, however, if the inclined floor 12B is supported only by the rotation shaft 14 of the inclined floor 12B and the distal end of the inclined floor 12B, reducing the thickness of the inclined floor 12B is likely to result in insufficient stiffness of the inclined floor 12B.

[0043] In this respect, in the passenger boarding bridge 100 of the present embodiment, at a

suitable position in the longitudinal direction of the inclined floor 12B of the floor member 12 (i.e., the front-rear direction in which the tunnel unit 10 extends and retracts), a support member 13, which supports the inclined floor 12B on the main surface of the floor member 11, is provided (see FIGS. 3A, 3B and FIGS. 4A, 4B). In the examples shown in FIGS. 3A, 3B and FIGS. 4A, 4B, the support member 13 is provided on the inclined floor 12B at a position that is rearward of the rotation shaft 15 and that is an intermediate position in the longitudinal direction of the swingable portion 12BA of the inclined floor 12B. However, the position at which the support member 13 is provided is not limited to this. For example, the support member 13 may be provided on the inclined floor 12B at a position corresponding to the rotation shaft 15.

[0044] By providing the support member 13 on the inclined floor 12B at a position between the rotation shaft 15 and the rotation shaft 14 or on the inclined floor 12B at a position corresponding to the rotation shaft 15, the inclined floor 13B can be maintained in a more stable orientation as compared with a case where the support member is provided on the inclined floor 12B at a position forward of the rotation shaft 15 (i.e., provided on the swingable portion 12BB). The reason for this is described below.

[0045] Assume a case where, as shown in FIG. 5, a support member 113 is provided on the inclined floor 12B at a position forward of the rotation shaft 15 (i.e., provided on the swingable portion 12BB). In this case, when a passenger steps on the rotation shaft 15, in view of the balance of moments with the support member 113 acting as a fulcrum, downward bending may occur at the rotation shaft 15. As a result, the distal end of the swingable portion 12BB may lift away from the main surface of the inclined floor 11B.

[0046] Specifically, let the weight of the swingable portion 12BB of the inclined floor 12B, the weight of the proximal portion 12BC of the inclined floor 12B, and the weight of a passenger be represented by “W_1”, “W_2”, and “F”, respectively, and let the distance between the support member 113 and the center of gravity position of the swingable portion 12BB and the distance between the support member 113 and the rotation shaft 15 be represented by “L_1” and “L_2”, respectively. When the passenger steps on the rotation shaft 15, in view of the balance of moments with the support member 113 acting as a fulcrum, if a relational expression (1) below is satisfied, downward bending occurs at the rotation shaft 15, and as a result, the distal end of the swingable portion 12BB lifts away from the main surface of the inclined floor 11B.

[0047] $$(W_2/2 + F) \times L_2 > W_1 \times L_1 \quad (1)$$

In this respect, in the passenger boarding bridge 100 of the present embodiment, since the support member 13 is provided on the inclined floor 12B at a position between the rotation shaft 15 and the rotation shaft 14 or on the inclined floor 12B at a position

corresponding to the rotation shaft 15, the rotation shaft 15 is suitably supported by the support member 13, and as a result, downward bending at the rotation shaft 15 can be made less likely to occur. That is, in the above cases, since "L_2" in the relational expression (1) is less than or equal to zero (i.e., $L_2 \leq 0$), the relational expression (1) is not satisfied.

[0048] It should be noted that, as a non-limiting example, the support member 13 may be made of, for example, a synthetic resin such as polyamide.

[0049] Incidentally, it has been found that when the overall length of the tunnel unit 10 of the passenger boarding bridge 100 is shortened and the inclined floors 11B and 12B of the adjacent inner and outer tunnels overlap each other in the up-down direction, the orientation of the inclined floor 12B of the inner tunnel IN becomes unstable.

[0050] The inventors of the present disclosure have conducted diligent studies, and as a result of the studies, they have found that, in the aforementioned overlapping orientation of the inclined floors 11B and 12B, as an inclination starting point 20 (see FIGS. 3A and 3B) of the outer tunnel OUT approaches the support member 13, the distal end of the inclined floor 12B of the inner tunnel IN may lift away from the main surface of the inclined floor 11B of the outer tunnel OUT and thereby a gap may be formed between them as denoted by (a) in a dashed-line frame DF1 of FIG. 2 and as shown in FIG. 3A.

[0051] In this respect, in the passenger boarding bridge 100 of the present embodiment, as denoted by (b) in the dashed-line frame DF1 of FIG. 2 and as shown in FIG. 3B, the swingable portion 12BB of the inclined floor 12B can be rotated clockwise about the rotation shaft 15 extending in the width direction of the swingable portion 12BB. As a result, the distal end of the inclined floor 12B of the inner tunnel IN can be suitably caused to be in contact with the main surface of the inclined floor 11B of the outer tunnel OUT.

[0052] Further, as a result of the diligent studies, the inventors of the present disclosure have found that, when the overlap between the inclined floors 11B and 12B further progresses and the distal end of the inclined floor 12B of the inner tunnel IN and the main surface of the inclined floor 11B of the outer tunnel OUT come into line contact with each other, the support member 13 provided on the inclined floor 12B of the inner tunnel IN may lift away from the main surface of the inclined floor 11B of the outer tunnel OUT and thereby a gap may be formed between them as denoted by (a) in a dashed-line frame DF2 of FIG. 2 and as shown in FIG. 4A.

[0053] In this respect, in the passenger boarding bridge 100 of the present embodiment, as denoted by (b) in the dashed-line frame DF2 of FIG. 2 and as shown in FIG. 4B, the swingable portion 12BB of the inclined floor 12B can be rotated counterclockwise about the rotation shaft 15 extending in the width direction of the swingable portion 12BB. As a result, the support

member 13 can be suitably caused to be in contact with the main surface of the inclined floor 11B of the outer tunnel OUT.

[0054] As described above, the passenger boarding bridge 100 of the present embodiment makes it possible to maintain the inclined floor 12B in a more stable orientation than in the conventional art while reducing the gradient of the floor member 12, which forms the walkway of the inner tunnel IN.

[0055] Specifically, in the overlapping orientation of the inclined floor 11B and the inclined floor 12B in the up-down direction, as described above, the distal end of the inclined floor 12B may lift away from the main surface of the inclined floor 11B. However, in the passenger boarding bridge 100 of the present embodiment, as a result of the swingable portion 12BB of the inclined floor 12B rotating about the rotation shaft 15, the distal end of the inclined floor 12B can be suitably caused to be in contact with the main surface of the inclined floor 11B.

[0056] Further, in the overlapping orientation of the inclined floor 11B and the inclined floor 12B in the up-down direction, as described above, the support member 13 provided on the inclined floor 12B may lift away from the main surface of the inclined floor 11B. However, in the passenger boarding bridge 100 of the present embodiment, as a result of the swingable portion 12BB of the inclined floor 12B rotating about the rotation shaft 15, the support member 13 can be suitably caused to be in contact with the main surface of the inclined floor 11B.

[0057] (Variations)

In the above description, a portion of the inclined floor 12B is configured as the swingable portion 12BA, which is rotatable relative to the fixed floor 12A side of the inclined floor 12B about the rotation shaft 14 extending in the width direction of the inclined floor 12B. However, this is a non-limiting example. The entire inclined floor 12B may be configured to be rotatable relative to the fixed floor 12A about the rotation shaft 14. In this case, the rotation shaft 14 is provided between the front end of the fixed floor 12A and the rear end of the inclined floor 12B of the floor member 12.

[0058] From the foregoing description, numerous modifications and other embodiments of the present disclosure are obvious to those skilled in the art. Accordingly, the foregoing description is to be construed as illustrative only, and is provided for the purpose of teaching those skilled in the art the best mode for carrying out the present disclosure. The structural and/or functional details may be substantially modified without departing from the spirit of the present disclosure.

Industrial Applicability

[0059] One aspect of the present disclosure is applicable to a passenger boarding bridge and makes it possible to maintain an inclined floor in a more stable orientation than in the conventional art while reducing the gradient of a floor member that forms a walkway of a tunnel.

Reference Signs List

[0060] 10: tunnel unit
10A: tunnel
11: floor member
11A: fixed floor
11B: inclined floor
12: floor member
12A: fixed floor
12B: inclined floor
12BA: swingable portion
12BB: swingable portion
12BC: proximal portion
13: support member
14: rotation shaft
15: rotation shaft
16: auxiliary stairs
18: apron
20: inclination starting point
30: drive column
40: cab
100: passenger boarding bridge
IN: inner tunnel
OUT: outer tunnel

CLAIMS

[Claim 1] A passenger boarding bridge comprising:

a tunnel unit including a plurality of tunnels that are fitted together in a nested manner, the tunnel unit being extendable and retractable in a front-rear direction;

a first floor member that forms a walkway of an outer tunnel of the tunnels that are adjacent to each other; and

a second floor member that forms a walkway of an inner tunnel of the tunnels that are adjacent to each other, wherein:

the second floor member is configured to slide on a main surface of the first floor member in accordance with extension and retraction of the tunnel unit;

the first floor member includes a first fixed floor and a first inclined floor, the first fixed floor being provided parallel to the front-rear direction, the first inclined floor extending from an end of the first fixed floor and being inclined downward;

the second floor member includes a second fixed floor and a second inclined floor, the second fixed floor being provided parallel to the front-rear direction, the second inclined floor extending from an end of the second fixed floor and being inclined downward;

the second floor member is provided with a support member that supports the second inclined floor on the main surface of the first floor member; and

at least a portion of the second inclined floor is configured as a first swingable portion that is rotatable relative to the second fixed floor side of the second inclined floor about a first shaft extending in a width direction of the second inclined floor, and a distal-end-side portion of the first swingable portion is configured as a second swingable portion that is rotatable relative to a proximal portion of the first swingable portion about a second shaft extending in a width direction of the first swingable portion.

[Claim 2] The passenger boarding bridge according to claim 1, wherein

the support member is provided on the second inclined floor at a position corresponding to the second shaft or on the second inclined floor at a position between the second shaft and the first shaft.

[Claim 3] The passenger boarding bridge according to claim 1 or 2, wherein

the second shaft includes a hinge that allows the second swingable portion to swing upward and downward.