CLAIMS

1. A passenger boarding bridge comprising:

a rotunda connected to an entrance of a terminal building;

a tunnel unit whose proximal end is connected to the rotunda, the tunnel unit being extendable and retractable, the tunnel unit being rotatable about the rotunda;

a cab provided at a distal end of the tunnel unit, the cab being configured to be docked with an aircraft;

a travel device that supports the tunnel unit and includes travel wheels configured to travel forward and backward, the travel device being configured such that a direction of forward travel of the travel wheels and a direction of backward travel of the travel wheels are changeable;

an operating device that is operated to input an operation command to the travel device; and

a determiner configured to, during a period from when the cab starts being moved from a predetermined position, the cab being moved through an operation of the operating device to cause the travel wheels to travel, until the cab is docked with the aircraft, while the travel wheels are traveling backward in accordance with an input of a backward travel operation command from the operating device, perform determination whether or not there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft as a result of the travel wheels traveling backward.

2. The passenger boarding bridge according to claim 1, wherein

the determiner is configured to:

while the travel wheels are traveling backward, calculate, multiple times sequentially, a coordinate value of a current position of a predetermined part of one of the tunnel unit, the cab, or the travel device by using an orthogonal coordinate system whose origin is a center point of the rotunda in a plan view; and

perform the determination based on a change in the coordinate value of the current position of the predetermined part, the coordinate value being calculated multiples times sequentially.

3. The passenger boarding bridge according to claim 2, wherein

as the orthogonal coordinate system, an XY orthogonal coordinate system whose origin is the center point of the rotunda in a plan view is preset such that, in the XY orthogonal coordinate system, regions that are located on an opposite side of the origin from the entrance of

the terminal building are a first quadrant and a second quadrant, and

the determiner is configured to:

in a case where an entrance, of the aircraft, with which the cab is to be docked is scheduled to be located in the first quadrant, while the travel wheels are traveling backward, calculate, multiple times sequentially, a Y coordinate value of the current position of the predetermined part of one of the tunnel unit, the cab, or the travel device by using the XY orthogonal coordinate system; and

perform the determination whether or not there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft based on whether or not the Y coordinate value of the current position, the Y coordinate value being calculated multiple times sequentially, increases.

4. The passenger boarding bridge according to claim 3, wherein

the determiner is configured to:

in a case where the entrance, of the aircraft, with which the cab is to be docked is scheduled to be located in the second quadrant, while the travel wheels are traveling backward, calculate, multiple times sequentially, an X coordinate value of the current position of the predetermined part by using the XY orthogonal coordinate system; and

perform the determination whether or not there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft based on whether or not the X coordinate value of the current position, the X coordinate value being calculated multiple times sequentially, decreases.

5. The passenger boarding bridge according to claim 2, wherein

as the orthogonal coordinate system, an XY orthogonal coordinate system whose origin is the center point of the rotunda in a plan view is preset such that, in the XY orthogonal coordinate system, regions that are located on an opposite side of the origin from the entrance of the terminal building are a first quadrant and a second quadrant, and

the determiner is configured to:

in a case where an entrance, of the aircraft, with which the cab is to be docked is scheduled to be located in the second quadrant, while the travel wheels are traveling backward, calculate, multiple times sequentially, an X coordinate value of the current position of the predetermined part of one of the tunnel unit, the cab, or the travel device by using the XY orthogonal coordinate system; and

perform the determination whether or not there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft based on whether or not the X coordinate value of the current position, the X coordinate value being calculated multiple times sequentially, decreases.

6. The passenger boarding bridge according to claim 1, further comprising a distance sensor that is mounted to the cab and that measures a distance between the cab and the aircraft, wherein

the determiner is configured to, while the travel wheels are traveling backward, perform the determination whether or not there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft based on whether or not the distance between the cab and the aircraft, the distance being measured by the distance sensor, decreases.

7. The passenger boarding bridge according to any one of claims 1 to 6, wherein

the determiner is configured to perform the determination when the distance between the cab and the aircraft is a predetermined distance or less.

8. The passenger boarding bridge according to any one of claims 1 to 7, further comprising a warning unit configured to perform warning in a case where the determiner determines that there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft.

9. The passenger boarding bridge according to any one of claims 1 to 8, wherein

the passenger boarding bridge is configured to stop the travel wheels from traveling backward in a case where the determiner determines that there is a possibility that the cab comes closer to the aircraft to get docked with the aircraft.