DESCRIPTION

Title of Invention: SYSTEM FOR PERFORMING AUTOMATIC INSPECTION OF PASSENGER BOARDING BRIDGE

Technical Field

[0001] The present invention relates to a system for performing an automatic inspection of a passenger boarding bridge.

Background Art

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

[0003] Patent Literature 1 discloses performing test operation of a passenger boarding bridge before docking the passenger boarding bridge with an aircraft. During the test operation, a terminal device installed in the cab of the passenger boarding bridge detects the presence or absence of abnormality in the devices of the passenger boarding bridge, and transmits data relating to abnormality to a centralized management server of a maintenance section that is in charge of the maintenance of the passenger boarding bridge.

Citation List

Patent Literature

[0004] PTL 1: Japanese Patent No. 4066419

Summary of Invention

Technical Problem

[0005] The above-described configuration of Patent Literature 1 does not give consideration to the aspect of coordination with persons, such as workers, when performing the test operation for an inspection of the passenger boarding bridge.

[0006] Embodiments of the present invention have been made to solve the above-described problems. Embodiments of the present invention provide a system for performing an automatic inspection of a passenger boarding bridge, the system making it possible to efficiently perform the automatic inspection of the passenger boarding bridge in improved coordination with persons, such as workers.

Solution to Problem

[0007] According to an aspect of the present invention, there is provided a system for performing an automatic inspection of a passenger boarding bridge including a plurality of devices that are operatable, the passenger boarding bridge including: a rotunda connected to a terminal building and rotatable in regular and reverse directions about a vertical axis; a tunnel unit whose proximal end is connected to the rotunda in such a manner that the tunnel unit is

liftable and lowerable, the tunnel unit including a plurality of tunnels that are fitted together in a telescopic manner, the tunnel unit being configured to be extendable and retractable in a longitudinal direction; a cab rotatably provided at a distal end of the tunnel unit; and a drive column mounted to a frontmost one of the tunnels of the tunnel unit or to the cab, the drive column including a lifting/lowering device and a travel device, the lifting/lowering device being configured to lift and lower the tunnel unit and the cab, the travel device being mounted below the lifting/lowering device and configured to travel on a ground, wherein each of the lifting/lowering device and the travel device is one of the plurality of devices, the system including: a notifier provided on at least one of the cab, the drive column, and the frontmost tunnel of the passenger boarding bridge; and a controller configured to control each of the devices and the notifier, wherein the controller is configured to: when an inspection start command is inputted to the controller, perform an operation test of each of the devices in a predetermined order to detect presence or absence of abnormality in each device; and during a period from when the inspection start command is inputted to the controller until the operation test of a last device among the devices is ended, cause the notifier to notify operation test-related information inside and/or outside the passenger boarding bridge, and the operation test-related information includes at least one of the following types of information: information that is notified before a start of the operation test of a first device among the devices, the information indicating that the automatic inspection is going to start; information that is notified during an automatic inspection period, the information indicating that the automatic inspection is being performed; information that is notified before the operation test of each device is performed, the information indicating that the operation test of the device is going to start; information that is notified while the operation test of each device is being performed, the information indicating that the operation test of the device is being performed; and information that urges a person to retreat.

[0008] According to the above aspect, during the period from when the inspection start command is inputted to the controller until the operation test of the last device is ended (i.e., during an automatic inspection period), the operation test-related information is notified inside and/or outside the passenger boarding bridge, and thereby a warning can be given inside and/or outside the passenger boarding bridge. This makes it possible to efficiently perform the automatic inspection of the passenger boarding bridge in improved coordination with persons, such as workers. The input of the inspection start command to the controller can be performed via communications, for example, by performing an inspection start operation with an external device that is located at a remote position from the passenger boarding bridge. By merely performing the inspection start operation, the automatic inspection can be carried out.

[0009] In the present specification and the claims, the operation test-related information includes at least one of the following types of information: information that is notified before the start of the operation test of the first device among the devices, the information indicating that the automatic inspection is going to start; information that is notified during the automatic inspection period, the information indicating that the automatic inspection is being performed;

information that is notified before the operation test of each device is performed (started), the information indicating that the operation test of the device is going to start; information that is notified while the operation test of each device is being performed, the information indicating that the operation test of the device is being performed; and information that urges a person to retreat. The operation test-related information may be notified in any manner, so long as the notified information is recognizable by a person, such as a worker. The operation test-related information may be notified, for example, in the form of verbal information outputted from a speaker, or in the form of audio information outputted from a speaker, such as particular music or a sound of a siren or the like, or in the form of light information from, for example, a revolving lamp, or any other lighting equipment, that emits light in a particular color, or in the form of characters and/or symbols displayed by a display device.

[0010] In an embodiment, the system may further include: a first sensor that detects a person inside the passenger boarding bridge; and a second sensor that detects a person outside the passenger boarding bridge. The controller may be configured to: in a case where a person is detected by the first sensor and/or the second sensor before performing the operation test of each device, cause the notifier to notify the operation test-related information that urges the person to retreat; and then perform the operation test when each of the first sensor and the second sensor detects no person any more.

[0011] According to the above embodiment, which includes the first sensor and the second sensor, the operation test is performed when no person is detected any more both inside and outside the passenger boarding bridge. This makes it possible to perform the operation test in improved coordination with persons.

[0012] In an embodiment, the system may further include: a first sensor that detects a person inside the passenger boarding bridge; and a second sensor that detects a person outside the passenger boarding bridge. The controller may be configured to: in a case where a person is detected by the first sensor and/or the second sensor while the operation test of each device is being performed, temporarily stop the operation test and cause the notifier to notify the operation test-related information that urges the person to retreat; and then resume the operation test when each of the first sensor and the second sensor detects no person any more.

[0013] According to the above embodiment, which includes the first sensor and the second sensor, in a case where a person is detected while the operation test is being performed, the operation test is stopped temporarily, and thereafter, when no person is detected any more, the operation test is resumed. This makes it possible to perform the operation test in improved coordination with persons.

[0014] In an embodiment, in the operation test of each device, the controller may be configured to perform control of the device to: cause the device to operate in one direction; and then cause the device to operate in a reverse direction, such that at an end of the operation test, the device is brought back to a state that the device is in at a start of the operation test.

[0015] According to the above embodiment, when all the operation tests are ended (i.e., when the inspection is ended), the passenger boarding bridge is in a state that the passenger

boarding bridge is in before the start of the first operation test (i.e., a state that the passenger boarding bridge is in before the start of the inspection). Accordingly, when the inspection is ended, the passenger boarding bridge is in a predetermined state at a predetermined position where the passenger boarding bridge stands by before being operated (i.e., before being docked with an aircraft). This makes it possible to smoothly perform the operation of docking the passenger boarding bridge with the aircraft when the aircraft arrives.

Advantageous Effects of Invention

[0016] Embodiments of the present invention as described above have an advantage of being able to provide a system for performing an automatic inspection of a passenger boarding bridge, the system making it possible to efficiently perform the automatic inspection of the passenger boarding bridge in improved coordination with persons, such as workers.

[0017] The above aspect, other aspects, features, and advantages of the present invention will be made clear by the following detailed description of a preferred embodiment with reference to the accompanying drawings.

Brief Description of Drawings

[0018] FIG. 1 is a schematic side view showing one example of a passenger boarding bridge according to one embodiment of the present invention.

FIG. 2 is a schematic plan view of the passenger boarding bridge of FIG. 1 as seen from above.

FIG. 3 is a schematic plan view of a travel device, and its vicinity, of the passenger boarding bridge of FIG. 1.

FIG. 4 is a block diagram schematically showing a connection relationship between a controller of the passenger boarding bridge of FIG. 1 and each component of the passenger boarding bridge.

FIG. 5 is a flowchart showing one example of operations performed when an automatic inspection is performed before operating the passenger boarding bridge of FIG. 1.

FIG. 6 is a flowchart showing one example of operations performed when an automatic inspection is performed before operating the passenger boarding bridge of FIG. 1.

Description of Embodiments

[0019] Hereinafter, a preferred embodiment of the present invention is described with reference to the drawings. In the drawings, the same or corresponding elements are denoted by the same reference signs, and repeating the same descriptions is avoided below. The present invention is not limited to the embodiment described below.