bridge with the aircraft, adjust the position of the aircraft by using a pushback truck or the like to tow the aircraft, thereby bringing the aircraft to the regular stop position; and thereafter dock the passenger boarding bridge with the aircraft.

[0006] The regular stop position of the aircraft is set as a stop position of the nose gear of the aircraft. Normally, the regular stop position is set corresponding to the aircraft type of the aircraft. Accordingly, the regular stop position may be different from one aircraft type to another. Aircraft type information about the aircraft may be inputted to a controller through an operation of an operating device by an operator. Alternatively, the controller may receive, from an external device such as a VDGS (Visual Docking Guidance System) or FIDS (Flight Information Display System), an input of aircraft type information about the aircraft.

[0007] However, the operator might erroneously input wrong aircraft type information, or some airports may not be equipped with the VDGS. In addition, there are a large number of airports that are not equipped with equipment for communications between the passenger boarding bridge and the FIDS or the like.

[0008] Embodiments of the present invention provide airport ground support equipment that makes it possible to calculate a discrepancy of an actual stop position of an aircraft from a regular stop position of the aircraft without requiring an input of aircraft type information about the aircraft.

Solution to Problem

[0009] According to an aspect of the present invention, there is provided an airport ground support equipment that includes: a support equipment body configured to perform an operation of coming close to an aircraft stopped on an apron from a standby position and to enable a person and/or an article to move between the support equipment body and the aircraft when the support equipment body is adjacent to or in contact with the aircraft; an aircraft type determiner that captures an image of the aircraft when the support equipment body is at the standby position and that determines an aircraft type of the aircraft based on the captured image; a nose gear image capturing camera that is mounted to the support equipment body and that captures an image of a nose gear of the aircraft stopped on the apron when the support equipment body is at the standby position; and a stop discrepancy calculator that detects a stop position of the nose gear based on the image captured by the nose gear image capturing camera and that calculates a discrepancy of the stop position of the nose gear from a regular stop position that is set in advance corresponding to the aircraft type determined by the aircraft type determiner.

[0010] The above aspect includes the aircraft type determiner, which captures an image of the aircraft and determines the aircraft type of the aircraft based on the captured image. The stop position of the nose gear is detected based on an image captured by the nose gear image capturing camera, which captures an image of the nose gear of the aircraft. The discrepancy of the stop position of the nose gear from the regular stop position that is set in advance corresponding to the aircraft type determined by the aircraft type determiner is calculated. In this manner, the discrepancy of the actual stop position of the aircraft from the regular stop position of the aircraft can be calculated without requiring an input of aircraft type information about the aircraft.

[0011] An embodiment of the above aspect of the airport ground support equipment includes: a first camera that captures an image of a painted pattern painted on the aircraft, the painted pattern being characteristic to an airline company that uses the aircraft; a second camera that captures an image of a cover of the nose gear of the aircraft; and a determination processor that determines the aircraft type of the aircraft based on the airline company that is identified from the painted pattern whose image has been captured by the first camera and an aircraft registration abbreviation that is marked on the cover of the nose gear whose image has been captured by the second camera.

[0012] According to the above embodiment, the aircraft type of the aircraft is determined based on the airline company identified from the aircraft's painted pattern whose image has been captured by the first camera and the aircraft registration abbreviation marked on the cover of the nose gear whose image has been captured by the second camera. Here, the official aircraft registration (the identification code of the aircraft) is uniquely determined from the airline company that uses the aircraft and the aircraft registration abbreviation that is set by the airline company, and the aircraft type of the aircraft is uniquely determined from the official aircraft registration. Thus, the aircraft type of the aircraft can be uniquely determined from the airline company that uses the aircraft and the aircraft registration abbreviation that is marked on the aircraft. This makes it possible to accurately determine the aircraft type of the aircraft. It should be noted that the same camera may double as the nose gear image capturing camera and the second camera.

[0013] An embodiment of the above aspect of the airport ground support equipment further includes a body controller that prohibits the support equipment body from performing the operation of coming close to the aircraft in a case where the discrepancy calculated by the stop discrepancy calculator is out of an allowable range.

[0014] According to the above embodiment, the support equipment body is prohibited from performing the operation of coming close to the aircraft in a case where the discrepancy of the stop position of the aircraft (nose gear) is out of the allowable range. This makes it possible to ensure a high degree of safety.

[0015] An embodiment of the above aspect of the airport ground support equipment further includes a notifier that notifies information about an abnormality in the stop position of the aircraft to outside in a case where the discrepancy calculated by the stop discrepancy calculator is out of the allowable range.

[0016] According to the above embodiment, since the information about the abnormality in the stop position of the aircraft can be notified to a worker on the apron, the worker can, for example, promptly adjust the stop position of the aircraft by using a pushback truck or the like.

Advantageous Effects of Invention

[0017] Embodiments of the present invention have an advantage of being able to provide airport ground support equipment that makes it possible to calculate a discrepancy of an actual stop position of an aircraft from a regular stop position of the aircraft without requiring an input of aircraft type information about the aircraft.

[0018] The above aspect, features, and advantages of the present invention will be made clear by the following detailed description of preferred embodiments with reference to the accompanying drawings.

Brief Description of Drawings

[0019] FIG. 1 is a schematic plan view of a passenger boarding bridge that is one example of airport ground support equipment according to an embodiment of the present invention.

FIG. 2 is a schematic side view of the passenger boarding bridge.

FIG. 3 is a view showing a cab distal end part to be docked with an aircraft, the view being taken from the aircraft side.

FIG. 4 schematically shows a control system of the passenger boarding bridge, including an operating panel.

FIG. 5 is a flowchart showing one example of a stop position determination process performed by a controller.

FIG. 6 is a schematic diagram showing one example of an image captured by a nose gear image capturing camera when the cab is at a standby position.