CLAIMS

1. A traveling direction state detection device for detecting a step, an inclination and an opening of a traveling surface on which wheels travel, comprising:

a first distance sensor installed near a front side of the wheels in a traveling direction and configured to linearly measure a distance to a first linear position perpendicular to the traveling direction, the first linear position existing on the traveling surface diagonally downward in the traveling direction;

a second distance sensor configured to linearly measure a distance to a second linear position perpendicular to the traveling direction, the second linear position existing on a traveling surface behind the traveling surface diagonally downward in the traveling direction, and ahead of ground contact points of the wheels in the traveling direction; and

a detector configured to

detect a step of the traveling surface based on an amount of change in the distance continuously measured by the second distance sensor at certain time intervals,

detect an inclination of the traveling surface based on an amount of change in the distance continuously measured by the first distance sensor at certain time intervals, and

detect an opening of the traveling surface based on an amount of change in a part of the distances to the first linear position and the second linear position.

2. A cart comprising

the traveling direction state detection device according to claim 1.

3. A cart comprising:

the traveling direction state detection device according to claim 1; and

a controller configured to control a traveling speed of the cart, wherein

the controller is configured to

decelerate the traveling speed in a case where the amount of change in the distances measured by the first distance sensor exceeds a predetermined first threshold, and

stop traveling of the cart in a case where the amount of change in the distances measured by the second distance sensor exceeds a predetermined second threshold.

4. The cart according to claim 3, wherein

the controller is configured to decelerate the traveling speed in a case where only the amount of change in the distances in the traveling direction of at least one of the wheels among distances measured by the first distance sensor exceeds the predetermined first threshold, and

stop the traveling of the cart in a case where only the amount of change in the distances in the traveling direction of at least one of the wheels among distances measured by the second distance sensor exceeds the predetermined second threshold.