

moving object for transporting products, such as a train or a transport vehicle. It is desired to establish a method for accurately calculating CO₂ emissions in the transportation process of each product to be delivered in such cases.

[0005] The present disclosure provides a management device and management method for accurately calculating CO₂ emissions in a transportation process of each product when a plurality of products is consolidated on a moving object for transporting products.

[0006] A management device according to one aspect of the present disclosure is a management device for managing a moving object, the moving object being an electrically driven vehicle and configured to transport a plurality of products as a consolidated load. The products include a first product and a second product. The management device includes: a communication device configured to communicate with the moving object to acquire information from the moving object; a storage device configured to store an amount of power consumed by the moving object in a transport section based on the information acquired from the moving object, and conversion information for converting an amount of power to CO₂ emissions; and a control device configured to calculate CO₂ emissions of the first product from the transportation and CO₂ emissions of the second product from the transportation, based on the power consumption, the conversion information, and a weight ratio between the first and second products loaded on the moving object. The transport section includes a first section where the first product and the second product are consolidated, and a second section where the first product is loaded and the second product is not loaded. The control device is configured to proportionally divide an amount of power consumed by the moving object in the first section between the first product and the second product based on the weight ratio between the first and second products, proportionally divide an amount of power consumed by the moving object in the second section to the first product, use the conversion information to convert the power consumption proportionally divided to the first product to the CO₂ emissions of the first product from the transportation, and use the conversion information to convert the power consumption proportionally divided to the second product to the CO₂ emissions of the second product from the transportation.

[0007] According to the above configuration, the control device calculates the CO₂ emissions of the first product from the transportation and the CO₂ emissions of the second product from the transportation, based on the amount of energy consumed by the transportation in the transport section where the products are consolidated and the weight ratio between the consolidated products. The CO₂ emissions of the first product from the transportation and the CO₂ emissions of the second product from the transportation can be appropriately calculated by using the weight ratio between the consolidated products.

[0008]

[0009] According to the above configuration, the control device proportionally divides the amount of energy consumed by the transportation in the transport section where the products are consolidated, based on the weight ratio between the consolidated products. The CO₂ emissions of the first product from the transportation and the CO₂ emissions of the

second product from the transportation can be appropriately calculated by proportionally dividing the amount of energy based on the weight ratio.

[0010]

[0011] According to the above configuration, the control device proportionally divides, for each section, the amount of energy consumed in the section based on the weight ratio between the consolidated products. Since the first product and the second product are consolidated in the first section, the control device proportionally divides (allots) the amount of energy consumed by the moving object in the first section between the first product and the second product based on the weight ratio. On the other hand, since the second product is not loaded in the second section, the control device proportionally divides (allots) the amount of energy consumed by the moving object in the second section to the first product. By thus proportionally dividing, for each section divided based on whether the products are consolidated, the amount of energy consumed in the section, the CO₂ emissions of the first product from the transportation and the CO₂ emissions of the second product from the transportation can be appropriately calculated.

[0012]

[0013] According to the above configuration, power consumption can be appropriately converted to CO₂ emissions.

[0014] A management method according to another aspect of the present disclosure is a management method for managing a moving object, the moving object being an electrically driven vehicle and configured to transport a plurality of products as a consolidated load. The products include a first product and a second product. The management method includes: reading an amount of power consumed by the moving object in a transport section from information acquired from the moving object, and conversion information for converting an amount of power to CO₂ emissions, wherein the transport section includes a first section where the first product and the second product are consolidated, and a second section where the first product is loaded and the second product is not loaded; calculating CO₂ emissions of the first product from the transportation and CO₂ emissions of the second product from the transportation, based on the power consumption, the conversion information, and a weight ratio between the first and second products loaded on the moving object; proportionally dividing an amount of power consumed by the moving object in the first section between the first product and the second product based on the weight ratio between the first and second products; proportionally dividing an amount of power consumed by the moving object in the second section to the first product; converting, based on the conversion information, the power consumption proportionally divided to the first product to the CO₂ emissions of the first product from the transportation; and converting, based on the conversion information, the power consumption proportionally divided to the second product to the CO₂ emissions of the second product from the transportation.

[0015] According to the present disclosure, in the case where a plurality of products is consolidated on a moving object for transporting products, CO₂ emissions in a transportation process of each product can be accurately calculated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] Features, advantages, and technical and industrial significance of exemplary embodiments of the invention will be described below with reference to the accompanying
5 drawings, in which like signs denote like elements, and wherein:

FIG. 1 shows the overall configuration of a management system 100 according to a first embodiment;

FIG. 2 shows the hardware configuration of the management system 100 according to the first embodiment;

10 FIG. 3 is a functional block diagram of a control device 51 showing a function to calculate CO₂ emissions from transportation by a transport train 5;

FIG. 4 is a flowchart of a process that is performed by the control device 51 to calculate the CO₂ emissions from the transportation by the transport train 5;

15 FIG. 5 shows the overall configuration of a management system 100A according to a second embodiment; and

FIG. 6 is a flowchart of a process that is performed by the control device 51 to calculate the CO₂ emissions from the transportation by the transport train 5.

CLAIMS

1. A management device for managing a moving object, the moving object being an electrically driven vehicle and configured to transport as a consolidated load a plurality of products including a first product and a second product, the management device characterized by comprising:

a communication device configured to communicate with the moving object to acquire information from the moving object;

a storage device configured to store an amount of power consumed by the moving object in a transport section based on the information acquired from the moving object, and conversion information for converting an amount of power to CO₂ emissions; and

a control device configured to calculate CO₂ emissions of the first product from the transportation and CO₂ emissions of the second product from the transportation, based on the power consumption, the conversion information, and a weight ratio between the first and second products loaded on the moving object,

wherein the transport section includes a first section where the first product and the second product are consolidated, and a second section where the first product is loaded and the second product is not loaded, and

wherein the control device is configured to proportionally divide an amount of power consumed by the moving object in the first section between the first product and the second product based on the weight ratio between the first and second products, proportionally divide an amount of power consumed by the moving object in the second section to the first product, use the conversion information to convert the power consumption proportionally divided to the first product to the CO₂ emissions of the first product from the transportation, and use the conversion information to convert the power consumption proportionally divided to the second product to the CO₂ emissions of the second product from the transportation.

2. The management device according to claim 1, wherein the conversion information is set for each type of power.

3. A management method for managing a moving object, the moving object being an electrically driven vehicle and configured to transport as a consolidated load a plurality of products including a first product and a second product, the management method characterized by comprising:

reading an amount of power consumed by the moving object in a transport section from information acquired from the moving object, and conversion information for converting an amount of power to CO₂ emissions, wherein the transport section includes a first section where the first product and the second product are consolidated, and a second section where the first product is loaded and the second product is not loaded;

calculating CO₂ emissions of the first product from the transportation and CO₂ emissions of the second product from the transportation, based on the power consumption, the conversion information, and a weight ratio between the first and second products loaded on the moving object;

proportionally dividing an amount of power consumed by the moving object in the first section between the first product and the second product based on the weight ratio between the first and second products;

proportionally dividing an amount of power consumed by the moving object in the second section to the first product;

converting, based on the conversion information, the power consumption proportionally divided to the first product to the CO₂ emissions of the first product from the transportation; and

converting, based on the conversion information, the power consumption proportionally divided to the second product to the CO₂ emissions of the second product from the transportation.

4. The management method according to claim 3, wherein the conversion information is set for each type of power.