CLAIMS

1. An inspection system that inspects a vapor compression refrigeration cycle device (26) included in a refrigerator (25) on a vehicle (2A, 2B), the inspection system comprising:

a cycle monitoring device (28) to be mounted on the vehicle together with the refrigeration cycle device to acquire operation status information indicating an operation status of the refrigeration cycle device and transmit the operation status information to outside; and

an information processing machine (50) arranged outside the vehicle to receive the operation status information from the cycle monitoring device and to inspect presence or absence of an abnormality in the refrigeration cycle device based on the operation status information, wherein

the information processing machine includes

an information storage unit (52) that stores the operation status information,

an information calculation unit (53) configured to generate inspection data for inspecting the presence or absence of an abnormality in the refrigeration cycle device based on the operation status information stored in the information storage unit, to store the inspection data in the information storage unit and to inspect the presence or absence of an abnormality in the refrigeration cycle device by comparing the inspection data with a reference data indicating a normal state or an abnormal state of the refrigeration cycle device, and

an information communication unit (51) that transmits an inspection result regarding the presence or absence of an abnormality in the refrigeration cycle device to a predetermined information terminal (60),

the operation status information includes a control state information indicating a control status of a control device included in the refrigeration cycle device,

the information storage unit stores a plurality of control state information after a previous inspection,

the information calculation unit specifies the control state information having a high degree of similarity with the control state information that is a basis of the inspection data used in the previous

inspection, and

the information calculation unit carries out a present inspection using the inspection data generated based on the operation status information including the specified control state information.

2. The inspection system according to claim 1, wherein

the information processing machine has a report creation unit (54) configured to create a report data in a predetermined format for reporting the inspection result of the refrigeration cycle device based on inspection result information indicating the inspection result of the presence or absence of an abnormality of the refrigeration cycle device in the information calculation unit, and to store the report data in the information storage unit, and

the information terminal is configured to acquire the report data from the information processing machine via the information communication unit.

3. The inspection system according to claim 2, wherein the information communication unit transmits at least one of the inspection result information and the report data to the information terminal in response to a request from the information terminal.

4. The inspection system according to claim 3, wherein

the information communication unit transmits at least one of the inspection result information and the report data to the information terminal regardless of the request from the information terminal when the information calculation unit detects an abnormality in the refrigeration cycle device.

5. The inspection system according to any one of claims 1 to 4, wherein

the refrigeration cycle device includes a circulation circuit (260) in which refrigerant circulates,

the operation status information includes refrigerant state data indicating a refrigerant state amount including temperature and pressure of the refrigerant circulating in the circulation circuit,

the information calculation unit generates a physical quantity

having a correlation with the amount of refrigerant in the circulation circuit as the inspection data by using at least the refrigerant state data, and

the information calculation unit inspects a suitability of the amount of refrigerant in the circulation circuit by comparing the physical quantity with the reference data.

6. An inspection system that inspects a vapor compression refrigeration cycle device (26) included in a refrigerator (25) on a vehicle (2A, 2B), the inspection system comprising:

a cycle monitoring device (28) to be mounted on the vehicle together with the refrigeration cycle device to acquire operation status information indicating an operation status of the refrigeration cycle device and transmit the operation status information to outside; and

an information processing machine (50) arranged outside the vehicle to receive the operation status information from the cycle monitoring device and to inspect presence or absence of an abnormality in the refrigeration cycle device based on the operation status information, wherein

the information processing machine includes

an information storage unit (52) that stores the operation status information,

an information calculation unit (53) configured to generate inspection data for inspecting the presence or absence of an abnormality in the refrigeration cycle device based on the operation status information stored in the information storage unit, to store the inspection data in the information storage unit and to inspect the presence or absence of an abnormality in the refrigeration cycle device by comparing the inspection data with a reference data indicating a normal state or an abnormal state of the refrigeration cycle device, and

an information communication unit (51) that transmits an inspection result regarding the presence or absence of an abnormality in the refrigeration cycle device to a predetermined information terminal (60),

the cycle monitoring device has a mode switching unit (284) to

switch an operation mode of the refrigeration cycle device, when a predetermined inspection condition is satisfied, to an inspection mode so that a control state of a control device included in the refrigeration cycle device becomes a predetermined state,

the information calculation unit identifies the operation status information when the refrigeration cycle device is in the inspection mode, from a plurality of operation status information stored in the information storage unit after a previous inspection, and

the information calculation unit inspects the presence or absence of an abnormality in the refrigeration cycle device using the inspection data generated based on the identified operation status information.

7. The inspection system according to claim 6, wherein

the information processing machine has a report creation unit (54) configured to create a report data in a predetermined format for reporting the inspection result of the refrigeration cycle device based on inspection result information indicating the inspection result of the presence or absence of an abnormality of the refrigeration cycle device in the information calculation unit, and to store the report data in the information storage unit, and

the information terminal is configured to acquire the report data from the information processing machine via the information communication unit.

8. The inspection system according to claim 7, wherein the information communication unit transmits at least one of the inspection result information and the report data to the information terminal in response to a request from the information terminal.

9. The inspection system according to claim 8, wherein

the information communication unit transmits at least one of the inspection result information and the report data to the information terminal regardless of the request from the information terminal when the information calculation unit detects an abnormality in the refrigeration cycle device.

10. The inspection system according to any one of claims 6 to 9, wherein

the refrigeration cycle device includes a circulation circuit (260) in which refrigerant circulates,

the operation status information includes refrigerant state data indicating a refrigerant state amount including temperature and pressure of the refrigerant circulating in the circulation circuit,

the information calculation unit generates a physical quantity having a correlation with the amount of refrigerant in the circulation circuit as the inspection data by using at least the refrigerant state data, and

the information calculation unit inspects a suitability of the amount of refrigerant in the circulation circuit by comparing the physical quantity with the reference data.

11. An information processing machine arranged outside a vehicle (2A, 2B) to communicate with a cycle monitoring device (28) configured to obtain operation status information indicating an operation status of a vapor compression refrigeration cycle device (26) included in a refrigerator (25) on the vehicle (25) and to transmit the operation status information to outside, the information processing machine comprising:

an information storage unit (52) that stores the operation status information received from the cycle monitoring device,

an information calculation unit (53) configured to generate inspection data for determining an abnormality of the refrigeration cycle device based on the operation status information stored in the information storage unit, to store the inspection data in the information storage unit and to inspect the presence or absence of an abnormality in the refrigeration cycle device by comparing the inspection data with a reference data indicating a normal state or an abnormal state of the refrigeration cycle device, and

an information communication unit (51) that transmits an inspection result regarding the presence or absence of abnormality in the refrigeration cycle device to a predetermined information terminal (60),

the operation status information includes a control state information indicating a control status of a control device included in the refrigeration cycle device,

the information storage unit stores a plurality of control state information after a previous inspection,

the information calculation unit specifies the control state information having a high degree of similarity with the control state information that is a basis of the inspection data used in the previous inspection, and

the information calculation unit carries out a present inspection using the inspection data generated based on the operation status information including the specified control state information.

12. An information processing machine arranged outside a vehicle (2A, 2B) to communicate with a cycle monitoring device (28) configured to obtain operation status information indicating an operation status of a vapor compression refrigeration cycle device (26) included in a refrigerator (25) on the vehicle (25) and to transmit the operation status information to outside, the information processing machine comprising:

an information storage unit (52) that stores the operation status information received from the cycle monitoring device,

an information calculation unit (53) configured to generate inspection data for determining an abnormality of the refrigeration cycle device based on the operation status information stored in the information storage unit, to store the inspection data in the information storage unit and to inspect the presence or absence of an abnormality in the refrigeration cycle device by comparing the inspection data with a reference data indicating a normal state or an abnormal state of the refrigeration cycle device, and

an information communication unit (51) that transmits an inspection result regarding the presence or absence of abnormality in the refrigeration cycle device to a predetermined information terminal (60),

the cycle monitoring device has a mode switching unit (284) to switch an operation mode of the refrigeration cycle device, when a predetermined inspection condition is satisfied, to an inspection mode

so that a control state of a control device included in the refrigeration cycle device becomes a predetermined state,

the information calculation unit identifies the operation status information when the refrigeration cycle device is in the inspection mode, from a plurality of operation status information stored in the information storage unit after a previous inspection, and

the information calculation unit inspects the presence or absence of an abnormality in the refrigeration cycle device using the inspection data generated based on the identified operation status information.