CLAIMS

1. A storage system comprising:

a storage structure having a plurality of storage sections for storing article holders for transporting articles and a carry-in-and-out portion for carrying in and carrying out the article holders;

one or more environment adjusters for adjusting storage environment of the articles held by the article holders in the storage sections, with the adjusting performed individually for each of the storage sections;

an environment managing portion for collecting information about the storage environment of the articles in each of the plurality of storage sections, and for controlling operation of the one or more environment adjusters;

a storage transport device for performing a carry out transport operation in which the article holder is transported from the storage section to the carry-in-and-out portion, and a carry in transport operation in which the article holder is transported from the carry-in-and-out portion to the storage section;

a primary managing device for outputting a carry out request for carrying out the article holder specified by identifying information provided to each of the article holders from the storage structure, and a carry in request for carrying in the article holder specified by the identifying information to the storage structure;

a carry-in-and-out managing device for managing locations of the storage sections in which the article holders are stored, by associating the locations of the storage sections in which the article holders are stored with the identifying information of the respective article holders, and for controlling the carry out transport operation or the carry in transport operation of the storage transport device based on the carry out request or the carry in request;

characterized in that

the environment managing portion is configured to generate environment management information indicating storage environment of the articles for each of the storage sections, and to output the environment management information to the carry-in-and-out managing device, wherein the carry-in-and-out managing device is configured to generate superordinate environment management information in which the environment management information for each of the storage sections outputted by the environment

managing portion is associated with the identifying information of the article holder stored in corresponding one of the storage sections, and is configured to output the superordinate environment management information to the primary managing device.

2. The storage system as defined in claim 1, characterized in that

the carry-in-and-out managing device is also configured to generate transport management information which is information about the carry in transport operation and the carry out transport operation, and to output the transport management information to the primary managing device,

wherein a plurality of distinct transport management information is provided as the transport management information,

wherein a plurality of distinct superordinate environment management information is provided as the superordinate environment management information,

wherein the carry-in-and-out managing device is configured to output the transport management information and the superordinate environment management information to the primary managing device with an information identifier that can be used to identify the transport management information and the superordinate environment management information.

3. The storage system as defined in claim 1 or 2, characterized in that

the environment management information is information that indicates which one of a plurality of kinds of states defined in advance the storage environment of the articles has come to be in.

4. The storage system as defined in one of claims 1 to 3, characterized in that

the environment management information includes information that indicates that an abnormal condition occurred in at least one of the one or more environment adjusters.

5. The storage system as defined in one of claims 1 to 4, characterized in that

each of the article holders is an airtight container for storing articles which should be stored in an inactive gas atmosphere,

wherein each of the one or more environment adjusters has an inactive gas supplying device which supplies inactive gas to the container stored in the

storage section, and

wherein the environment management information includes information indicating that supplying of inactive gas to the container by the inactive gas supplying device is started or information that the supplying of the inactive gas to the container is completed.

6. A storage method utilizing a storage system, the storage system including a storage structure having a plurality of storage sections for storing article holders for transporting articles and a carry-in-and-out portion for carrying in and carrying out the article holders, one or more environment adjusters for adjusting storage environment of the articles held by the article holders in the storage sections, with the adjusting performed individually for each of the storage sections, an environment managing portion for collecting information about the storage environment of the articles in each of the plurality of storage sections, and for controlling operation of the one or more environment adjusters, a storage transport device for performing a carry out transport operation in which the article holder is transported from the storage section to the carry-in-and-out portion, and a carry in transport operation in which the article holder is transported from the carry-in-and-out portion to the storage section, a primary managing device for outputting a carry out request for carrying out the article holder specified by identifying information provided to each of the article holders from the storage structure, and a carry in request for carrying in the article holder specified by the identifying information to the storage structure, and a carry-in-and-out managing device for managing locations of the storage sections in which the article holders are stored, by associating the locations of the storage sections in which the article holders are stored with the identifying information of the respective article holders, and for controlling the carry out transport operation or the carry in transport operation of the storage transport device based on the carry out request or the carry in request, wherein the environment managing portion is configured to generate environment management information indicating storage environment of the articles for each of the storage sections, and to output the environment management information to the carry-in-and-out managing device,

the storage method comprising the following step that is performed by the carry-in-and-out managing device:

an information output step of generating superordinate environment

management information in which the environment management information for each of the storage sections outputted by the environment managing portion is associated with the identifying information of the article holder stored in corresponding one of the storage sections, and outputting the superordinate environment management information to the primary managing device.

7. The storage method as defined in claim 6, characterized in that

the information output step further includes generating transport management information which is information about the carry in transport operation and the carry out transport operation, and outputting the transport management information to the primary managing device,

wherein a plurality of distinct transport management information is provided as the transport management information,

wherein a plurality of distinct superordinate environment management information is provided as the superordinate environment management information, and

wherein in the information output step, the transport management information and the superordinate environment management information are outputted to the primary managing device with an information identifier that can be used to identify the transport management information and the superordinate environment management information.

8. The storage method as defined in claim 6 or 7, characterized in that

the environment management information is information that indicates which one of a plurality of kinds of states defined in advance the storage environment of the articles has come to be in.

9. The storage method as defined in one of claims 6 to 8, characterized in that

the environment management information includes information that indicates that an abnormal condition occurred in at least one of the one or more environment adjusters.

10. The storage method as defined in one of claims 6 to 9, characterized in that

each of the article holders is an airtight container for storing articles which should be stored in an inactive gas atmosphere,

wherein each of the one or more environment adjusters has an inactive gas supplying device which supplies inactive gas to the container stored in the storage section, and

wherein the environment management information includes information indicating that supplying of inactive gas to the container by the inactive gas supplying device is started or information that the supplying of the inactive gas to the container is completed.

CLAIMS

1. A storage system comprising:

a storage structure having a plurality of storage sections for storing article holders for transporting articles and a carry-in-and-out portion for carrying in and carrying out the article holders;

one or more environment adjusters for adjusting a storage environment of the articles held by the article holders in the storage sections, wherein the adjusting is performed individually for each of the storage sections;

an environment managing portion for collecting information about the storage environment of the articles in each of the plurality of storage sections, and for controlling operation of the one or more environment adjusters;

a storage transport device for performing a carry out transport operation in which the article holder is transported from the storage section to the carry-in-and-out portion, and a carry in transport operation in which the article holder is transported from the carry-in-and-out portion to the storage section;

a primary managing device for outputting a carry out request for carrying out the article holder specified by identifying information provided to each of the article holders from the storage structure, and a carry in request for carrying in the article holder specified by the identifying information to the storage structure;

a carry-in-and-out managing device for managing locations of the storage sections in which the article holders are stored, by associating the locations of the storage sections in which the article holders are stored with the identifying information of the respective article holders, and for controlling the carry out transport operation or the carry in transport operation of the storage transport device based on the carry out request or the carry in request;

wherein the environment managing portion is configured to generate environment management information indicating the storage environment of the articles for each of the storage sections, and to output the environment management information to the carry-in-and-out managing device, and wherein the carry-in-and-out managing device is configured to generate superordinate

environment management information in which the environment management information for each of the storage sections outputted by the environment managing portion is associated with the identifying information of the article holder stored in corresponding one of the storage sections, and is configured to output the superordinate environment management information to the primary managing device.

2. The storage system as defined in claim 1, wherein:

the carry-in-and-out managing device is also configured to generate transport management information which is information about the carry in transport operation and the carry out transport operation, and to output the transport management information to the primary managing device,

wherein a plurality of distinct transport management information is provided as the transport management information,

wherein a plurality of distinct superordinate environment management information is provided as the superordinate environment management information, and

wherein the carry-in-and-out managing device is configured to output the transport management information and the superordinate environment management information to the primary managing device with an information identifier that can be used to identify the transport management information and the superordinate environment management information.

3. The storage system as defined in claim 1, wherein:

the environment management information is information that indicates which one of a plurality of kinds of states defined in advance the storage environment of the articles has come to be in.

4. The storage system as defined in claim 1, wherein:

the environment management information includes information that indicates that an abnormal condition occurred in at least one of the one or more environment adjusters.

5. The storage system as defined in claim 1, wherein:

each of the article holders is an airtight container for storing articles which should be stored in an inactive gas atmosphere,

wherein each of the one or more environment adjusters has an inactive gas supplying device which supplies inactive gas to the container stored in the storage section,

wherein the environment management information includes information indicating that supplying of inactive gas to the container by the inactive gas supplying device is started or information that the supplying of the inactive gas to the container is completed.

6. A storage method utilizing a storage system, the storage system including:

a storage structure having a plurality of storage sections for storing article holders for transporting articles, and

a carry-in-and-out portion for carrying in and carrying out the article holders,

one or more environment adjusters for adjusting a storage environment of the articles held by the article holders in the storage sections, wherein the adjusting is performed individually for each of the storage sections,

an environment managing portion for collecting information about the storage environment of the articles in each of the plurality of storage sections, and for controlling operation of the one or more environment adjusters,

a storage transport device for performing a carry out transport operation in which the article holder is transported from the storage section to the carry-in-and-out portion, and a carry in transport operation in which the article holder is transported from the carry-in-and-out portion to the storage section,

a primary managing device for outputting a carry out request for carrying out the article holder specified by identifying information provided to each of the article holders from the storage structure, and a carry in request for carrying in the article holder specified by the identifying information to the storage structure, and

a carry-in-and-out managing device for managing locations of the storage sections in which the article holders are stored, by associating the locations of the storage sections in which the article holders are stored with the identifying information of the respective article holders, and for controlling the carry out transport operation or the carry in transport operation of the storage transport device based on the carry out request or the carry in request,

wherein the environment managing portion is configured to generate environment management information indicating the storage environment of the articles for each of the storage sections, and to output the environment management information to the carry-in-and-out managing device,

the storage method comprising the following step that is performed by the carry-in-and-out managing device:

an information output step of generating superordinate environment management information in which the environment management information for each of the storage sections outputted by the environment managing portion is associated with the identifying information of the article holder stored in corresponding one of the storage sections, and outputting the superordinate environment management information to the primary managing device.

7. The storage method as defined in claim 6, wherein:

the information output step further includes generating transport management information which is information about the carry in transport operation and the carry out transport operation, and outputting the transport management information to the primary managing device,

wherein a plurality of distinct transport management information is provided as the transport management information,

wherein a plurality of distinct superordinate environment management information is provided as the superordinate environment management information, and

wherein in the information output step, the transport management information and the superordinate environment management information are outputted to the primary managing device with an information identifier that can be used to identify the transport management information and the superordinate environment management information.

8. The storage method as defined in claim 6, wherein:

the environment management information is information that indicates which one of a plurality of kinds of states defined in advance the storage environment of the articles has come to be in.

9. The storage method as defined in claim 6, wherein:

the environment management information includes information that indicates that an abnormal condition occurred in at least one of the one or more environment adjusters.

10. The storage method as defined in claim 6, wherein:

each of the article holders is an airtight container for storing articles which should be stored in an inactive gas atmosphere, wherein each of the one or more environment adjusters has an inactive gas supplying device which supplies inactive gas to the container stored in the storage section, and

wherein the environment management information includes information indicating that supplying of inactive gas to the container by the inactive gas supplying device is started or information that the supplying of the inactive gas to the container is completed.