For example, even the cold source system disclosed in Patent Literature 1 has difficulty controlling a plurality of freezers while keeping a high COP when a heat load is changed.

【0006】

Embodiments of the present invention seek to provide a cold source system capable of controlling a plurality of refrigerators while keeping a high coefficient of performance.

Means to Solve the Problems

【0007】

According to an aspect, there is provided a cold source system including: at least two sets of cold source machines having a refrigerator; a simulation unit ~~which~~ configured to calculates a coefficient of performance of each of cold source machines; a priority-determining unit ~~which~~ configured to determines an order of operation in such a manner that the higher maximum coefficient of performance the cold source machines have, the higher the priority of the operation is set to be; a schedule-determining unit ~~which~~ configured to determines an operation schedule in such a manner that the cold source machines with the higher priority are preferentially operated based on a prediction of a change in cold demand of a heat load; and an operation-controlling unit which operates the cold source machines based on the operation schedule, wherein the simulation unit is configured to calculate, by changing a wet-bulb temperature and a load ratio of the cold source machines, the load ratio of the cold source machines at which an evaluation function is the lowest value, the evaluation function taking as parameters the wet-bulb temperature and the load ratio of the cold source machines, and the priority-determining unit is configured to set the priority of the operation of the cold source machines in such a manner that the priority of the operation of the cold source machine of which evaluation function has lower value is increased.

Effect of the Invention

【0008】

Embodiments of the present invention may provide a cold source system capable of controlling a plurality of refrigerators while keeping a high coefficient of performance.

Brief Description of the Drawings

CLAIMS

1. A cold source system comprising:

at least two cold source machines having a refrigerator;

a simulation unit ~~which~~ configured to calculate~~s~~ a coefficient of performance of each of the cold source machines;

a priority-determining unit ~~which~~ configured to determine~~s~~ an order of operation in such a manner that the higher maximum coefficient of performance the cold source machines have, the higher the priority of the operation is set to be;

a schedule-determining unit ~~which~~ configured to determine~~s~~ an operation schedule in such a manner that the cold source machines with the higher priority are preferentially operated based on a prediction of a change in cold demand of a heat load; and

an operation-controlling unit which operates the cold source machines based on the operation schedule, wherein

the simulation unit is configured to calculate, by changing a wet-bulb temperature and a load ratio of the cold source machines, the load ratio of the cold source machines at which an evaluation function is the lowest value, the evaluation function taking as parameters the wet-bulb temperature and the load ratio of the cold source machines, and

the priority-determining unit is configured to set the priority of the operation of the cold source machines in such a manner that the priority of the operation of the cold source machine of which evaluation function has lower value is increased.

2. The cold source system according to Claim 1, further comprising a cold storage tank which stores cold energy produced by the cold source machines,

wherein the schedule-determining unit configured to determine~~s~~ the operation schedule so as to operate the cold source machines at predetermined load ratios including load ratios with the highest coefficient of performance and so as to offset a difference between cold production of

the cold source machines and the cold demand of the heat load by using the cold energy stored in the cold storage tank.

3. The cold source system according to Claim 2, wherein the schedule-determining unit configured to determines the operation schedule so as to operate the cold source machines at the predetermined load ratios including the load ratios with the highest coefficient of performance during each of a cold release period when the cold demand is generated in the heat load and a cold storage period when the cold production of the cold source machines are

stored in the cold storage tank.

4. The cold source system according to Claim 2, wherein the cold storage tank is a water storage tank which stores cold water cooled in the cold source machines.

5. The cold source system according to Claim 3, wherein the cold storage tank is a water storage tank which stores cold water cooled in the cold source machines.

6. The cold source system according to Claim 4 or 5, further comprising a cold supply pump which supplies the cold water stored in the water storage tank to the heat load,

wherein the cold supply pump can adjust a supply amount of the cold water supplied to the heat load.

7. The cold source system according to any one of Claims 1 to 5, wherein the schedule-determining unit configured to determines the operation schedule based on predetermined prediction data which predict a change in the cold demand.

8. The cold source system according to Claim 6, wherein the schedule-determining unit configured to determines the operation schedule based on predetermined prediction data which predict a change in the cold demand.