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SPECIFICATION

TITLE OF THE INVENTION

Cold Storage

BACKGROUND OF THE INVENTION

The present invention relates to a cold storage in which a front opening of a storage chamber is closed by a glass door in such a manner as to be freely opened and closed.

Conventionally, this kind of cold storage, particularly, a show case for displaying drink products, food products and the like forms a storage chamber within a heat insulating box body, for example, as shown in Japanese Patent Unexamined Publication No. 9-101075, and a front opening of the storage chamber is closed by a see-through glass door in such a manner as to be freely opened and closed. Further, a machine chamber is placed in a lower portion outside the heat insulating box body, and a compressor, a condenser, a fan for the condenser and the like constituting a refrigerating cycle of a cooling apparatus are placed within the machine chamber. Still further, a cooling device constituting the refrigerating cycle is provided within the storage chamber, thereby cooling an inner portion of the storage chamber to a predetermined low temperature by the cooling device.

As mentioned above, when the inner portion of the storage chamber is cooled, an inner surface of the glass door is exposed to a cold air. On the contrary, since a heat insulating performance of the glass door has a limit, a moisture in the ambient air is inevitably condensed on the

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front surface so as to form a dew condensation. When such a dew condensation is generated, a visibility of the glass door is deteriorated, so that conventionally the glass door is heated by an electric heater and the like.

However, the heating by the heater causes an increased consumption of the electric energy in the show case. Then, in the publication mentioned above, the front surface of the glass door has been designed such as to be hard to form a dew condensation by piercing an outlet port on an upper surface of a cover of the machine chamber and blowing out a warm air from the fan for the condenser.

However, in the conventional structure mentioned above, since the outlet port is simply pierced on the upper surface of the cover of the machine chamber, the warm air ascending from the outlet port is immediately diffused and does not expand to the front surface of the glass door. Accordingly, there has been a problem that a sufficient effect of preventing a dew condensation can not be obtained.

SUMMARY OF THE INVENTION

The present invention is made by solving the problem in the conventional art, and an object of the present invention is to provide a cold storage which effectively prevents a dew condensation from being formed on a glass door by utilizing an air from a fan for a condenser.

A cold storage in accordance with the present invention comprises:

a storage chamber provided within a heat insulating box



body;

a glass door for closing a front opening of the storage chamber in such a manner as to be freely opened and closed;

a machine chamber positioned below the storage chamber and provided out of the heat insulating box body;

a compressor, a condenser and a fan for the condenser placed within the machine chamber; and

a machine chamber cover closing a front surface of the machine chamber in such a manner as to be freely opened and closed and positioned below the glass door,

wherein an outlet portion is formed on an upper surface of the machine chamber cover so as to blow out an air discharged from the fan for the condenser from the outlet portion toward a front surface of the glass door, and a guide wall for directing an air current blown out from the outlet portion toward the glass door is formed in the machine chamber cover.

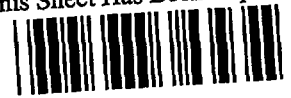
In accordance with the present invention, since there is provided the cold storage comprising:

the storage chamber provided within the heat insulating box body;

the glass door for closing the front opening of the storage chamber in such a manner as to be freely opened and closed;

the machine chamber positioned below the storage chamber and provided out of the heat insulating box body;

the compressor, the condenser and the fan for the



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condenser placed within the machine chamber; and

the machine chamber cover closing the front surface of the machine chamber in such a manner as to be freely opened and closed and positioned below the glass door,

wherein the outlet portion is formed on the upper surface of the machine chamber cover so as to blow out the air discharged from the fan for the condenser from the outlet portion toward the front surface of the glass door, and the guide wall for directing the air current blown out from the outlet portion toward the glass door is formed in the machine chamber cover, a warm air current fed out from the fan for the condenser is guided by the guide wall, directed toward the glass door and blown out from the outlet portion to the front surface of the glass door.

Accordingly, the warm air is going to expand to a wider area on the front surface of the glass door, so that it is possible to further improve an effect of preventing a dew condensation from being formed on the front surface of the glass door.

Further, in the cold storage in accordance with the present invention, the guide wall expands downward from the outlet portion on the inner surface of the machine chamber cover, and is integrally molded with the machine chamber cover by a hard synthetic resin.

In accordance with the structure mentioned above, in addition to the effect mentioned above, since the guide wall expands downward from the outlet portion on the inner surface

of the machine chamber cover, and is integrally molded with the machine chamber cover by a hard synthetic resin, it is possible to realize an improvement of an outer appearance while improving a productivity due to a reduction of a number of the parts.

Further, in each cold storage in accordance with the present invention, a honeycomb member is provided in the outlet portion.

In accordance with the structure mentioned above, in addition to the effect of each of the inventions, since the honeycomb member is provided in the outlet portion, a warm air current from the outlet portion is rectified by the honeycomb member and a directivity thereof is further improved. Accordingly, it is possible to further improve the effect of preventing the dew condensation from being formed on the front surface of the glass door.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a vertical cross sectional side elevational view of a cold storage in accordance with the present invention;

Fig. 2 is a perspective view of a cold storage in accordance with the present invention;

Fig. 3 is a rear perspective view of a machine chamber cover of a cold storage in accordance with the present invention; and

Fig. 4 is a rear perspective view of a machine chamber cover in accordance with another embodiment of a cold storage

of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Hereinafter, an embodiment in accordance with the present invention will be described below with reference to the accompanying drawings. A cold storage 1 in the embodiment is constituted by a heat insulating box body 4 provided with a storage chamber 3 having an opening 2 on a front surface therewithin, a machine chamber 7 formed outside the heat insulating box body 4 disposed below the storage chamber 3 and having an opening 6 on a front surface thereof, and the like. A partition plate 8 is mounted at a rear portion within the storage chamber 3 at an interval with respect to a back surface of the heat insulating box body 4, and a duct 11 is formed between the partition plate 8 and the heat insulating box body 4.

Then, an evaporator 13 constituting a known refrigerating circuit of a cooling cycle in a cooling apparatus is vertically provided within the duct 11, and a topmost portion of the duct 11 is communicated with the storage chamber 3 by a suction port 14 formed in a front portion of the upper surface of the storage chamber 3. Then, a suction type cooling fan 16 is provided within the duct 11 disposed at the back of the suction port 14. A plural stages of racks 17 for displaying articles are provided within the storage chamber 3 disposed in front of the partition plate 8, and a lower side of the lowermost rack 17 is communicated with a discharge port 18 disposed at a lower end of the duct

11. Accordingly, a cold air within the storage chamber 3 from the suction port 14 is sucked by the cooling fan 16 and is blown out toward the evaporator 13. Then, the cold air cooled in the evaporator 13 is discharged from the discharge port 14 into the storage chamber 3 so as to perform a circulation.

Further, the front opening of the storage chamber 3 is closed by a glass door 22 to which a see-through multi-layered glass 21 is fitted, in such a manner as to be freely opened and closed. The glass door 22 is pivotally supported to the heat insulating box body 4 by hinges 23 and 23 at upper and lower portions of a right side facing to the glass door 22 in such a manner as to freely rotate.

On the contrary, a compressor 26, a condenser 27 and the like constituting the refrigerating circuit of the cooling cycle are placed within the machine chamber 7, and a condenser fan 28 for blowing to them is also provided. In this case, the condenser 27 is positioned substantially at a center portion in a lateral direction of the opening 6 and placed on a stand 29, and the condenser fan 28 is placed at the back thereof, and further, at the back thereof, the compressor 26 is placed on the table 29.

The condenser fan 28 is a suction type blower, and is mounted at a rear end of a fan case 31 extending rearward from the condenser 27. Accordingly, when the condenser fan 28 is operated, an air existing in front of the condenser 27 is sucked within the condenser 27 and is blown to the

compressor 26 disposed at the back thereof via the condenser 27 and the condenser fan 28. Therefore, a heat radiation of the condenser 27 and the compressor 26 is promoted. Further, a back surface of the machine chamber 7 is closed by a closing plate 32, and a machine chamber cover 33 is mounted to the front opening 6 and positioned below the upper glass door 22.

The machine chamber cover 33 is made of a hard synthetic resin, a front surface thereof is formed in a curved shape as shown in Fig. 3, and an engaging portion 34 and engaging hook 36 for mounting to the heat insulating box body 3 are respectively formed in upper and lower edges thereof. Further, an outlet portion 37 is provided in an upper surface of the machine chamber cover 33, and the outlet portion 37 vertically expands in an inner surface of the machine chamber cover 33 and is sectioned into right and left portions by a plurality of guide walls 41 integrally formed with the machine chamber cover 33 and each having a predetermined width in a longitudinal direction, whereby a plurality of outlet ports 42 are formed within the outlet portion 37.

Further, a center portion of an inner surface of the machine chamber cover 33 is sectioned in a rectangular shape by a sectioning wall 43 integrally formed with the machine chamber cover 33, slit-shaped suction ports 44 are formed on a front surface corresponding to the sectioning wall 43, an inner area of the sectioning wall 43 is all open to a rear

surface. The guide walls 41 vertically extend at a predetermined size at right and left portions, and each of the outlet ports 42 formed thereby is communicated with the rear surface of the machine chamber cover 33. Further, each of the outlet ports 42 corresponding to an upper side of the sectioning wall 43 is communicated with the rear surface of the machine chamber cover 33 at the upper side of the sectioning wall 43. Still further, a dew receiving portion 47 open to an upper portion is formed in the rear portion of the upper surface of the machine chamber cover 33.

When the machine chamber cover 33 is mounted to the opening 6 of the machine chamber 7, all the periphery of the rear edge of the sectioning wall 43 corresponds to the peripheral edge of the front surface of the condenser 27. Accordingly, the condenser 27 is communicated with the front portion of the machine chamber cover 33 via the suction ports 44, and the inner portion of the machine chamber 7 is communicated with the upper portion of the machine chamber cover 33 via each of the outlet ports 42 at the outside of the sectioning wall 43.

In the structure mentioned above, when the compressor 26, the condenser fan 28 and the cooling fan 16 are operated, the evaporator 13 performs a cooling operation, and a cold air cooled thereby is circulated within the storage chamber 3 by the cooling fan 16 as mentioned above. Accordingly, the inner portion of the storage chamber 3 is cooled to a predetermined low temperature (for cooling and refrigerating).

On the other hand, an ambient air in front of the mechanical chamber cover 33 is sucked from the suction ports 44 by operating the condenser fan 28, and is at first flowed into the condenser 27 so as to air cool. Next, it is blown to the compressor 26 via the condenser fan 28, and air cools it. The ambient air (hot air) warmed by subsequently air cooling the condenser 27 and the compressor 26 in this manner is turned back at the upper portion within the machine chamber 7 as shown by an arrow in Fig. 1 since the rear surface of the machine chamber 7 is closed by the closing plate 32, and it moves forward.

Then, the warm air moving forward along the outer side of the fan case 31 and the sectioning wall 43 is soon blown out upward from the outlet ports 42 via portions between the guide walls 41 as shown by an arrow in Fig. 2. At this time, a stream of the warm air is directed to the glass door 22 disposed in the upper portion. Accordingly, a diffusion after blowing out is delayed, and the warm air is going to expand to a wider area in the front surface of a glass 21 on the glass door 22. A dew condensation on the front surface of the glass door 22 can be effectively prevented or restricted by an ascending current of the warm air.

Here, in the case that a dew condensation is generated on the front surface of the glass door 22, the dew drops down along the front surface and flows into the dew receiving portion 47. Then, the dew is smoothly evaporated by the warm air flowing in the lower side and the front side of the dew

receiving portion 47 as mentioned above.

Next, Fig. 4 shows another embodiment in accordance with the present invention. In this case, a honeycomb member 51 provided with a plurality of passages in a vertical direction is mounted to the outlet portion 37 on the upper surface of the machine chamber cover 33. In accordance with the structure, a stream of the warm air from the outlet portion 37 is rectified by the honeycomb member 51 and a directivity thereof is further improved. Accordingly, it is possible to further improve an effect of preventing a dew condensation from being formed on the front surface of the glass door 22.

Here, in this case, it is needless to say that the upper portion of the guide walls 41 positioned within the outlet portion 37 in Fig. 3 will be cancelled.

In accordance with the present invention in detail mentioned above, since there is provided the cold storage comprising:

- the storage chamber provided within the heat insulating box body;

- the glass door for closing the front opening of the storage chamber in such a manner as to be freely opened and closed;

- the machine chamber positioned below the storage chamber and provided out of the heat insulating box body;

- the compressor, the condenser and the fan for the condenser placed within the machine chamber; and

the machine chamber cover closing the front surface of the machine chamber in such a manner as to be freely opened and closed and positioned below the glass door,

wherein the outlet portion is formed on the upper surface of the machine chamber cover so as to blow out the air discharged from the fan for the condenser from the outlet portion toward the front surface of the glass door, and the guide wall for directing the air current blown out from the outlet portion toward the glass door is formed in the machine chamber cover, a warm air current fed out from the fan for the condenser is guided by the guide wall, directed toward the glass door and blown out from the outlet portion to the front surface of the glass door.

Accordingly, the warm air is going to expand to a wider area on the front surface of the glass door, so that it is possible to further improve an effect of preventing a dew condensation from being formed on the front surface of the glass door.

Further, since the guide wall expands downward from the outlet portion on the inner surface of the machine chamber cover, and is integrally molded with the machine chamber cover by a hard synthetic resin, it is possible to realize an improvement of an outer appearance while improving a productivity due to a reduction of a number of the parts.

Still further, since the honeycomb member is provided in the outlet portion, a warm air current from the outlet portion is rectified by the honeycomb member and a

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directivity thereof is further improved. Accordingly, it is possible to further improve the effect of preventing the dew condensation from being formed on the front surface of the glass door.



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WHAT IS CLAIMED IS:

1. A cold storage comprising:

a storage chamber provided within a heat insulating box body;

a glass door for closing a front opening of the storage chamber in such a manner as to be freely opened and closed;

a machine chamber positioned below said storage chamber and provided out of said heat insulating box body;

a compressor, a condenser and a fan for the condenser placed within the machine chamber; and

a machine chamber cover closing a front surface of said machine chamber in such a manner as to be freely opened and closed and positioned below said glass door,

wherein an outlet portion is formed on an upper surface of said machine chamber cover so as to blow out an air discharged from said fan for the condenser from said outlet portion toward a front surface of said glass door, and a guide wall for directing an air current blown out from said outlet portion toward said glass door is formed in said machine chamber cover.

2. A cold storage as claimed in claim 1, wherein the guide wall expands downward from the outlet portion on the inner surface of the machine chamber cover, and is integrally molded with said machine chamber cover by a hard synthetic resin.

3. A cold storage as claimed in claim 1 or 2, wherein a honeycomb member is provided in the outlet portion.

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