

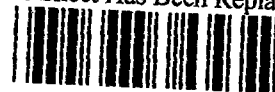
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## SPECIFICATION

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TITLE OF THE INVENTION

Low-temperature Showcase ✓

BACKGROUND OF THE INVENTION

The present invention relates to a low-temperature showcase in which an opening of a storage chamber is openably closed by a lid formed of a transparent wall.

In a conventional low-temperature showcase for use in the sale of ice creams or other goods, for example, as described in Japanese Utility Model Publication No. 19730/1993 (F25D17/06), a storage chamber is formed in an insulating box having an opening in its top surface, and the top opening of the insulating box is openably closed by two glass doors (lids) which are horizontally slidably disposed on a rail formed along an edge of the opening and vertically overlapped with each other.

In the low-temperature showcase, the storage chamber inside (below) the glass doors has a freezing temperature, while the outside (upper portion) of the glass doors is exposed to the atmospheric air. Therefore, humidity in the atmospheric air is condensed into dew on the outer surfaces (top surfaces) of the glass doors cooled from the storage chamber.

If the dew condensation occurs, the glass doors fog, and the visibility of the storage chamber through the glass doors is lowered to remarkably lower the selling effect of the goods.

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to the periphery of the low-temperature showcase in time, or sticks to client's clothing or the like, which also causes a problem in hygiene.

To solve the problem, the heating by an electric heater disposed on the glass door or the raising of the insulating performance of the glass door itself has been proposed, but the electric heater or the glass door formed of a layered glass remarkably increases the cost. Furthermore, the problem of dew condensation does not occur depending on the region or the season in which the low-temperature showcase is installed.

#### SUMMARY OF THE INVENTION

The present invention has been developed to solve the aforementioned conventional technical problems, and an object thereof is to provide a low-temperature showcase which can effectively prevent or suppress dew condensation on a lid plate at a low cost.

The low-temperature showcase of the present invention is provided with a lid plate formed of a transparent wall for openably closing an opening of a storage chamber, and a cover material formed of a transparent sheet or a transparent film is detachably attached to the lid plate with a predetermined gap on the side of the storage chamber.

According to the present invention, in the low-temperature showcase provided with the lid plate formed of the transparent wall for openably closing the opening of the storage chamber, since the cover material formed of the transparent sheet or the transparent

film is detachably attached to the lid plate with the predetermined gap on the side of the storage chamber, an insulating space is formed between the lid plate and the cover material, so that the cooling action received by the lid plate from the storage chamber can be moderated.

Therefore, the dew condensation on the outer surface of the lid plate exposed to the atmospheric air can effectively be eliminated, so that the visibility can be maintained while the hygiene can be improved. Especially, since the cover material is formed of the transparent sheet or the transparent film, the cost can be minimized, while the cover material itself fails to inhibit the visibility inside the storage chamber.

Moreover, since the cover material is detachably attached to the lid plate, it can be detached and set aside when unnecessary, which provide a great convenience.

Furthermore, the aforementioned low-temperature showcase of the present invention is provided with a connecting portion for connecting the space between the lid plate and the cover material to the inside of the storage chamber.

According to the present invention, since the connecting portion for connecting the space between the lid plate and the cover material to the inside of the storage chamber is additionally formed, the dew condensation occurring between the lid plate and the cover material can be eliminated by dry cool air in the storage chamber, so that the visibility can further be enhanced.

Furthermore, in the aforementioned low-temperature showcase of the present invention, the lid plate is formed of the transparent

wall and a frame for surrounding the periphery of the transparent wall, and the cover material is held in the frame.

According to the present invention, since the lid plate is formed of the transparent wall and the frame for surrounding the periphery of the transparent wall, and the cover material is held in the frame, the gap between the cover material and the transparent wall can easily be held. Moreover, since the cover material is attached to the frame, the number of components can be reduced.

Furthermore, the low-temperature showcase of the present invention is additionally provided with a predetermined advertisement displayed on the cover material.

Since the cover material of the present invention is additionally provided with the predetermined advertisement display, the goods can appeal through the transparent wall, and the selling effect can be enhanced.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a low-temperature showcase according to one embodiment of the present invention.

Fig. 2 is a vertical sectional side view of an upper front section of the low-temperature showcase of the present invention.

Fig. 3 is a vertical sectional side view of an upper rear section of the low-temperature showcase of the present invention.

Fig. 4 is a vertical sectional front view of an upper portion of the low-temperature showcase of the present invention.

Fig. 5 is a vertical sectional side view of an upper front

section of the low-temperature showcase according to another embodiment of the present invention.

Fig. 6 is a vertical sectional side view of an upper rear section of the low-temperature showcase of Fig. 5.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Embodiments of the present invention will next be described in detail with reference to the drawings. A showcase 1 of the present invention is a freezing showcase which is installed, for example, in a supermarket, a convenience store or another store for cooling and selling ice creams or other goods and which is provided with an insulating box 3 having an opening 2 in its top surface.

The insulating box 3 comprises an outer box 4 of a steel plate having an opening in its top surface; an inner box 6 of a hard synthetic resin (or a steel plate) incorporated with an interval in the outer box 4 and having an opening in its top surface; a breaker 7 of a hard synthetic resin for connecting opening edges of both boxes 4, 6; and a foamed polyurethane insulating material 8 foamed/filled in a space surrounded with both boxes 4, 6 and the breaker 7. Furthermore, the top opening 2 is inclined higher in its rear than in its front.

Moreover, a storage chamber 9 for storing the goods is formed in the inner box 6, and cooled to a predetermined freezing temperature by a cooling device (not shown).

On the other hand, engagement grooves 5, 10 are formed in inner and outer lower edges of the breaker 7, in which upper edges of both boxes 6, 4 are inserted from below, engaged and connected.

Moreover, the inner periphery of the top surface of the breaker 7 is stepped/molded to form upper and lower rail portions 11, 12.

Two lid plates 13, 14 are slidably laid on the rail portions 11, 12 to openably close the opening 2. Each of the lid plates 13, 14 is constituted of a peripheral frame 16 of a hard synthetic resin and a transparent wall or transparent plate glass (or a transparent acrylic resin plate) 18 engaged in the frame 16. The lid plates 13, 14 are horizontally slidably laid on the rail portions 11, 12, the upper lid plate 13 is overlapped with the lower lid plate 14, and the lower lid plate 14 is formed to have a smaller vertical dimension than the upper lid plate 13.

Moreover, a soft fin piece 17 extending downward is attached to the frame 16 of the upper lid plate 13 on the overlapped side. When the opening 2 is closed by both lid plates 13, 14, the soft fin piece 17 abuts on the frame 16 of the lower lid plate 14 to seal the space between both lid plates 13, 14.

Furthermore, hand grips 19 are integrally raised/formed from the frames 16 on the outer sides of the lid plates 13, 14. Additionally, lower portions 16A of upper and lower sides of the frame 16 are extended apart from each other under the glass 18, and have support portions 21 formed thereon. The support portions 21 are opened on mutually opposed (inner) sides and on right and left sides, and cover materials 22 are attached to the support portions 21.

In Figs. 2 to 4, the cover material 22 is formed of a transparent sheet of synthetic resin. For example, the cover material 22 is inserted between the upper or lower support portion 21 and the

glass 18 from the side, and its upper or lower edge of the cover material 22 is detachably laid on each support portion 21. In the condition, as shown in the drawings, a predetermined gap G is formed between the cover material 22 and the glass 18.

Additionally, the cover material 22 for the glass 18 is positioned on the side of the storage chamber 9 to cover substantially the entire area of the glass 18 exposed to the storage chamber 9 from the frame 16. As shown in Fig. 4, slight spaces S (connecting portions) are formed in opposite sides of the cover material 22.

As described above, since the cover materials 22 are detachably attached to the lid plates 13, 14 with the gaps G on the side of the storage chamber 9, insulating spaces are formed in the gaps G between the lid plates 13, 14 and the cover materials 22, so that the cooling action exerted to the lid plates 13, 14 by the cool air circulating inside the storage chamber 9 can be moderated.

Therefore, the dew condensation on the outer surfaces (top surfaces) of the glass plates 18 of the lid plates 13, 14 exposed to the atmospheric air is effectively prevented, so that the visibility is maintained while the hygiene can be improved.

Especially, since the cover material 22 is formed of the transparent sheet, the cost can be minimized. Additionally, the cover material 22 itself fails to inhibit the visibility of the inside of the storage chamber 9.

Moreover, since the cover materials 22 can be detachably attached to the lid plates 13, 14, they can be removed and set aside when unnecessary, which provides a great convenience. By forming spaces S on the opposite sides of the cover material 22, the space

(gap G) between the lid plate 13 or 14 and the cover material 22 is connected to the inside of the storage chamber 9. Therefore, the dry cool air in the storage chamber 9 can prevent the dew condensation from occurring between the lid plate 13 or 14 and the cover material 22.

The connecting portions may be formed by making small-diameter through holes in the cover material 22 instead of the spaces S.

Moreover, since the support portions 21 are formed on the frame 16, the gap between the cover material 22 and the glass 18 can easily be kept. Additionally, since the cover material 22 is attached to the frame 16, the number of components can be reduced.

Here, Figs. 5 and 6 show another embodiment of the present invention. In the embodiment, the cover material 22 is formed of a transparent film. Support grooves 23 are extended horizontally and formed in lower portions 16A of upper and lower sides of the frame 16. The upper and lower edges of the extended cover material 22 are attached to the support grooves 23, and protruded support members 24 shown in the drawings are detachably engaged in the support grooves 23 by which the cover material 22 is held.

In the condition, as shown in the drawings, gap G is formed between the cover material 22 and the glass 18 as described above. The cover material 22 for the glass 18 is positioned on the side of the storage chamber 9 to cover substantially the entire area of the glass 18 exposed to the storage chamber 9 from the frame 16. Similarly, slight spaces S are formed in opposite sides of the cover material 22.

The embodiment also provides the aforementioned effect.

Moreover, when a predetermined advertisement is printed on the cover material 22, the goods stored inside can appeal through the glass 18, and the selling effect can be enhanced.

Additionally, in the aforementioned embodiments, the upper and lower edges of the cover materials 22 are held by the lid plates 13, 14, but the present invention is not limited to the embodiments. Opposite edges of the cover materials 22 may be held. In this case, when the lid plate 13 or 14 is moved horizontally to open/close, the atmospheric air is prevented from entering the gap between the glass 18 and the cover material 22.

As described above in detail, according to the present invention, in the low-temperature showcase provided with the lid plate formed of the transparent wall for openably closing the opening of the storage chamber, the cover material of the transparent sheet or the transparent film is detachably attached to the lid plate with the predetermined gap on the side of the storage chamber. Therefore, the insulating space is formed between the lid plate and the cover material to moderate the cooling action exerted to the lid plate from the storage chamber.

Therefore, the dew condensation on the lid plate outer surface exposed to the atmospheric air can effectively be eliminated, so that the visibility can be maintained while the hygiene can be improved. Especially, since the cover material is formed of the transparent sheet or the transparent film, the cost can be minimized. Additionally, the cover material itself fails to inhibit the visibility of the inside of the storage chamber.

Moreover, since the cover material is detachably attached to the

lid plate, it can be removed and set aside when unnecessary, which provides a great convenience.

Additionally, since the connecting portion for connecting the space between the lid plate and the cover material to the inside of the storage chamber is formed, the dew condensation occurring between the lid plate and the cover material can be eliminated by the dry cool air in the storage chamber. Therefore, the visibility can further be enhanced.

Furthermore, the lid plate is constituted of the transparent wall and the frame surrounding the periphery of the transparent wall, and the cover material is held in the frame. Therefore, the gap between the cover material and the transparent wall can easily be kept. Additionally, since the cover material is attached to the frame, the number of components can be reduced.

Still furthermore, when the cover material is additionally provided with the predetermined advertisement, the goods can appeal through the transparent wall, and the selling effect can be enhanced.

WHAT IS CLAIMED IS:

1. A low-temperature showcase provided with a lid plate formed of a transparent wall for openably closing an opening of a storage chamber, wherein

a cover material formed of a transparent sheet or a transparent film is detachably attached to said lid plate with a predetermined gap on the side of the storage chamber.

2. The low-temperature showcase according to claim 1 wherein a connecting portion is formed for connecting a space between the lid plate and the cover material to the inside of the storage chamber.

3. The low-temperature showcase according to claim 1 or 2 wherein the lid plate comprises the transparent wall and a frame surrounding a periphery of the transparent wall, and the cover material is held by said frame.

4. The low-temperature showcase according to claim 1, 2 or 3 wherein a predetermined advertisement is displayed on the cover material.

