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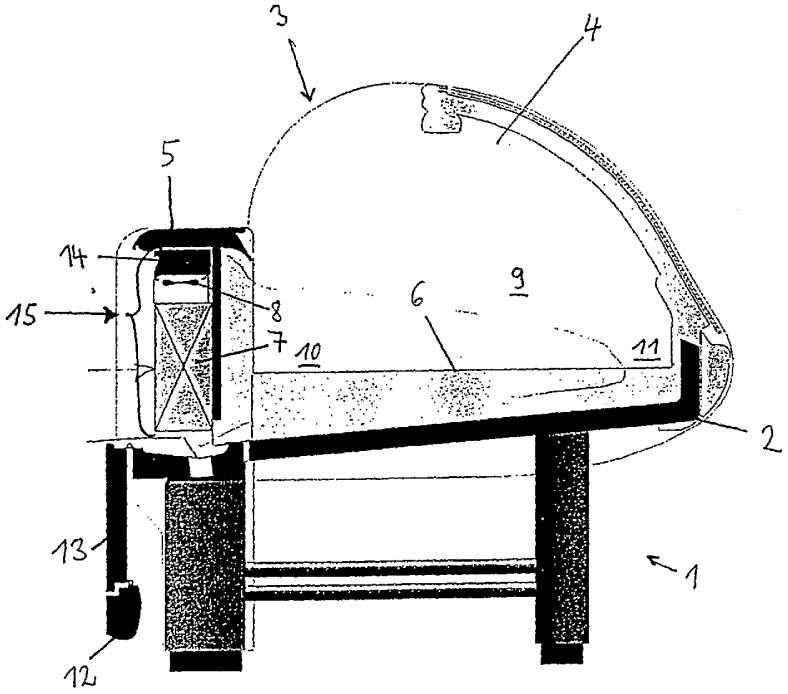
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(54) Title: REFRIGERATED DISPLAY CASE



(57) Abstract: The present invention relates to a refrigerated display case (1) comprising a display platform (6) supporting the goods to be refrigerated, a device for cooling (7) and a device for venting (8) an air flow which are both located next to one of the vertical walls of the refrigerated display case and comprising at least one lid (12, 13, 5) which in an open position permits access to the cooling device (7) and the venting devices (8).

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Refrigerated display case

Description

The present invention relates to a refrigerated display case comprising a display platform supporting the goods to be refrigerated, a device for cooling and a device for venting an air flow which are both located next to one of the vertical walls of the refrigerated display case.

Common refrigerated display cases comprise a display platform supporting the goods to be refrigerated and a device for cooling and a device for venting an air flow. A cooling device is provided to cool the air flow which is supposed to cool the goods displayed on the display platform. For this purpose the refrigerated display case further comprises a venting device, e. g. a fan, giving the cold air a certain flow direction entering the space above the display platform at one side of the display case and flowing to the other side of the display case and flowing back to the rear side underneath the display platform cooling the underside of this platform in addition. The flow of cold air can be operated either continuously or discontinuously. Both operating modes are known in the prior art.

Customarily the cooling and venting devices are located underneath the display platform causing divers problems for service, maintenance and cleaning of this equipment. The problem on the one hand is that cleaning agent used for the display platform can penetrate through seams or gaps in the display platform and spoil the devices located underneath. On the other hand the display platform and all goods displayed have to be taken out in case of service or

repair work has to be done on said devices underneath. This causes a lot of effort and can only be done during closing hours of the shop.

Document DE 33 47 361 A1 discloses cooling and venting devices being located at the rear wall of a refrigerated display case. The access to the cooling and venting devices is only provided via the display space inside the refrigerated display case with the known discomfort for service, maintenance and cleaning of the cooling and venting devices.

Thus, it is an object of the present invention to provide an easy access to the cooling and venting devices for service, maintenance, cleaning and repair.

In accordance with the present invention this object is solved by a refrigerated display case comprising at least one lid which in an open position permits access to the cooling device and the venting device.

In an embodiment of the invention, the cooling device comprises an evaporator and a heat exchanger and the venting device is for example designed as a fan or a radial blower.

In accordance with an embodiment of the present invention the refrigerated display case further comprises a sterilising device for sterilising the cooling air. The sterilising device eliminates germs from the cooled air. This is especially important for non-wrapped products such as meat or cheese.

In accordance with an embodiment of the invention, the at least one lid, when in an open position, permits access to the sterilising device

In accordance with an embodiment of the present invention the refrigerated display case has a rear wall comprising at least two lids a first one of which,

when in an open position, permits access to the sterilising device and a second one of which, when in an open position, permits access to at least one of the cooling and venting devices

In accordance with an embodiment of the present invention the cooling device, the venting device and the sterilising device form a module. For example a common frame connects the devices and builds up a module that advantageously comprises a handle. The handle can be used to take out the module through an open lid, for example.

In accordance with an embodiment of the present invention each lid comprises a fold-away or hinge mechanism. The fold-away or hinge mechanism can be operated independently or alternatively being connected in such a way that the lids open successively. With the latter an opening is created by every lid folded away that increases in width without any lid obstructing the opening as it could occur with independently hinged lids.

In accordance with an embodiment of the present invention a lid is provided as fold-away working platform permitting access to the module from above, when in an open position. This lid is supposed to form a horizontal platform, when in closed position, and can be used as a working platform by vendor personnel. It is common practice to display refrigerated goods such as meat or the like to the customer in a refrigerated display case comprising a partly open top at the vendors side and a part covered by glass or other transparent material at the customer side. At the vendors side in most cases a working platform is provided where the vendor personnel can for example chop the meat and wrap the products to be sold. This type of refrigerated display cases are in use at butcher or dairy shops, supermarkets and retail shops.

In accordance with an embodiment of the present invention the sterilising device comprises a germ filter. The sterilising device comprises a filter which kills germs being present in the cooled air. Alternatively the sterilising device can comprise an ultraviolett (UV) light source located in a radiation chamber where cooled air is sterilised by flowing through that chamber. Another alternative is to provide an ozon-containing chamber wherein the germs are killed too. The easy access to the sterilisation device is of great importance because the filter, UV-chamber or ozon-chamber need to be maintained quite frequently. Therefore the advantage of an embodiment is quite obvious where the sterilising device is located on top of the module. This embodiment provides easy access from the top, e.g. from the fold-away working platform and/or from the rear via a first lid.

Embodiments of the present invention are described in greater detail below with reference to the Figures, wherein

Figure 1 shows a refrigerated display case with an inventive module with closed lids,

Figure 2 shows a refrigerated display case with an inventive module with open lids,

Figure 3 shows a refrigerated display case with an inventive module with an open first lid and a closed second lid.

Figure 1 shows a refrigerated display case 1 with a basic case 2 with a partly open top 3 at the vendors side and a part 4 covered by glass at the customer side. A working platform 5 is provided for the vendor personnel to cut or wrap the products to be sold, e.g. meat or diary products. The working platform 5 is mounted in a fold-away manner as indicated by the dotted line showing an

open position. The products are placed on a display platform 6 which the customer is able to overlook easily from the customer side through the glass wall 4.

A cooling device 7 is provided to cool the air flow which is supposed to cool the goods displayed on the display platform 6. For this purpose the cooling device 7 is combined with a fan 8 as venting device giving the cold air a certain flow direction entering the space 9 above the display platform 6 at the rear side 10 of the basic case 2, flowing to the front 11 or customer side of the basic case 2 and flowing back to the rear side underneath the display platform cooling the underside of this platform in addition. This flow direction is indicated by arrows in figure 1. The working platform 5 as well as the first lid 12 and the second lid 13 are shown in closed position here. The sterilising device 14 is located at the top of the module 15. The module 15 comprises the cooling device 7, the venting device 8 and the sterilising device 14. The air cooled by the cooling device 7 which comprises an evaporator and a heat exchanger is vented by the fan 8 to create a certain flow direction, the flow flowing through the sterilising device 14 to kill the germs which are present in the cooled air. In this example a UV-chamber 14 is used to sterilise the coold air. The flow of cooled air is driven through the UV-chamber 14 where it is subjected to ultraviolett radiation which kills most of the germs.

Figure 2 shows the first and second lid 12, 13 described above with reference to Figure 1 in open position providing access to the module 15 for service, maintenance, cleaning or repair work. The first lid 12 is mounted to the second lid 13 by a hinge providing a successive opening mode where the second lid 13 open implies an open first lid 12. Therefore an open first lid 12 does not obstruct the opening of the second lid 13 as it could be the case with independently mounted fold-away lids.

In the embodiment illustrated in the Figures, both lids 12 and 13, when closed, form a rear wall of the compartment receiving the module 15, with the second lid 13 being hinged to a lower part of said compartment and the first lid 12 being hinged to a free end of the second lid 13, as shown in the Figures. If there is need of access to the sterilising device 14 only, it is sufficient to open the first lid only. If there is need of access to the cooling device 7 and/or the fan 8, both lids 12 and 13 are opened commonly.

Access to the sterilising device 14 is also possible from above through the pivotable working platform 5 when it is pivoted into an open position. It is further possible to remove the entire module 15 from its compartment through the opened working platform 5.

Figure 3 shows only the first lid 12 open in order to take out the sterilising device 14 which is shown being taken out.

Claims

1. Refrigerated display case (1) comprising a display platform (6) supporting the goods to be refrigerated, a device for cooling (7) and a device for venting (8) an air flow which are both located next to one of the vertical walls of the refrigerated display case and comprising at least one lid (12, 13, 5) which in an open position permits access to the cooling device (7) and the venting devices (8).

2. Refrigerated display case (1) according to claim 1 further comprising a sterilising device (14) for sterilising (14) the cooling air, the at least one lid (12, 13, 5), when in an open position, permits access to the sterilising device (14).

3. Refrigerated display case (1) according to claim 2 having a rear wall comprising at least two lids (12, 13) a first one of which, when in an open position, permits access to the sterilising device (14) and a second one (13) of which, when in an open position, permits access to at least one of the cooling and venting devices (7, 8).

4. Refrigerated display case (1) according to claim 2 or 3 wherein the cooling device (7), the venting device (8) and the sterilising device (14) form a module (15).

5. Refrigerated display case (1) according to any of claims 1 to 4 wherein each lid (12, 13, 5) comprises a fold-away or hinge mechanism (16).

6. Refrigerated display case (1) according to claim 5 wherein the fold-away or hinge mechanism (16) of each lid is operable independently.

7. Refrigerated display case (1) according to claim 2, wherein the fold-away or hinge mechanisms are connected to the lids (12, 13) in such a way that the lids open successively.

8. Refrigerated display case (1) according to any of claims 1 to 7 wherein a lid is provided as fold-away working platform (5) permitting access to the module (15) from above, when in an open position.

9. Refrigerated display case (1) according to any of claims 2 to 8 wherein the sterilising device (14) comprises a germ filter.

10. Refrigerated display case according to any of claims 2 to 9 wherein the sterilising device (14) comprises an ultraviolett light source located in a radiation chamber (UV-chamber).

11. Refrigerated display case according to any of claims 2 to 10 wherein the sterilising device (14) comprises an ozon-containing sterilising chamber.

12. Refrigerated display case (1) according to any of claims 2 to 11 wherein the sterilising device (14) is located at the top of the module (15).

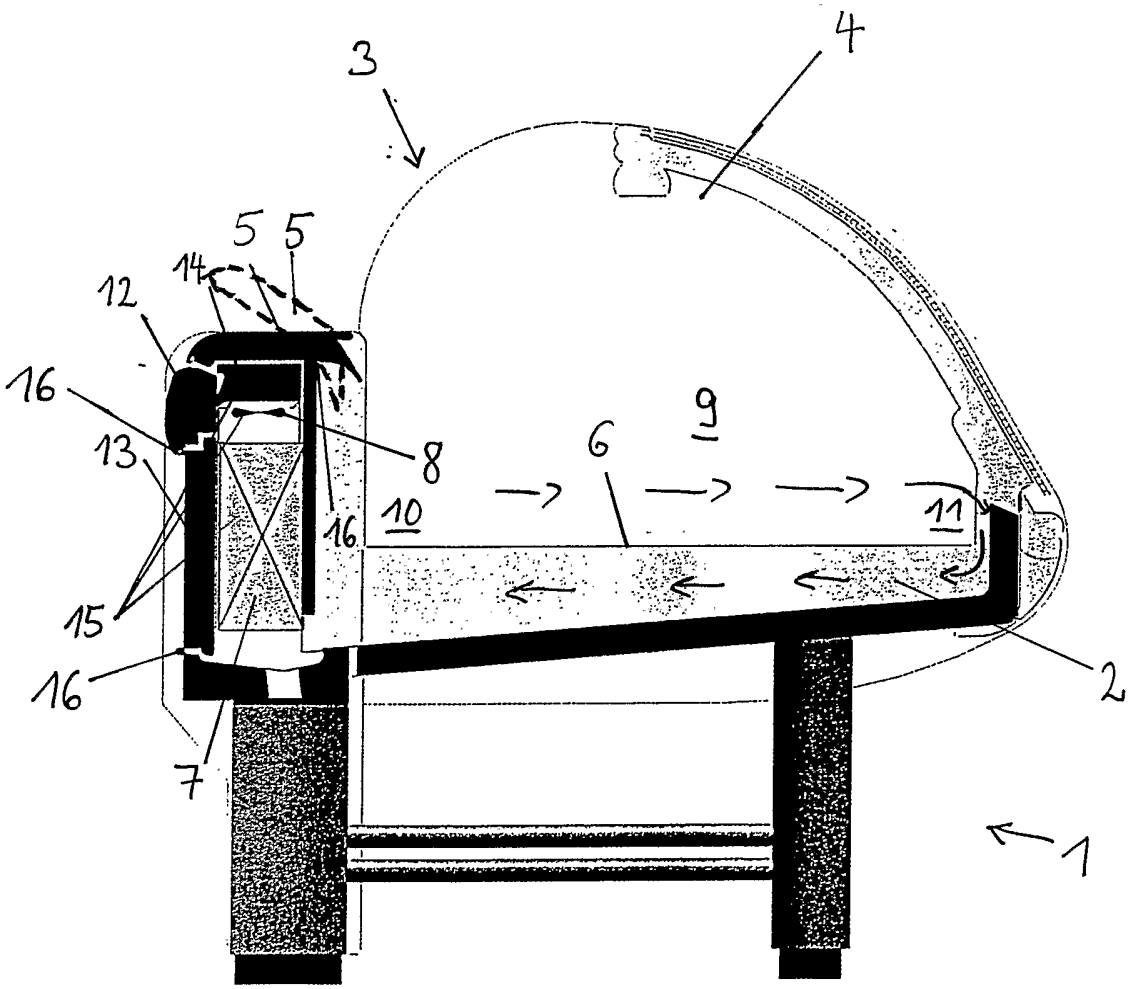


Fig. 1

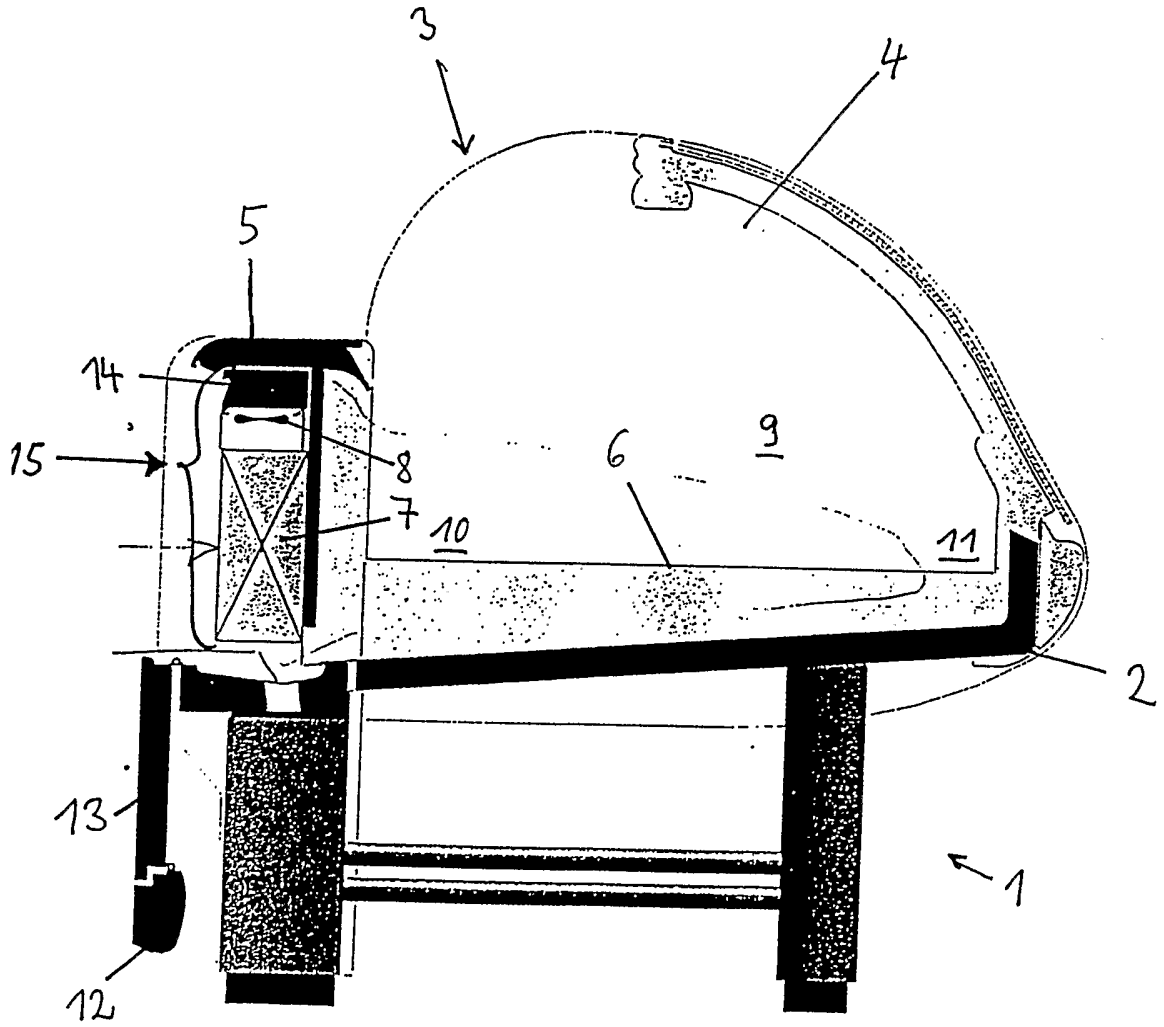


Fig. 2

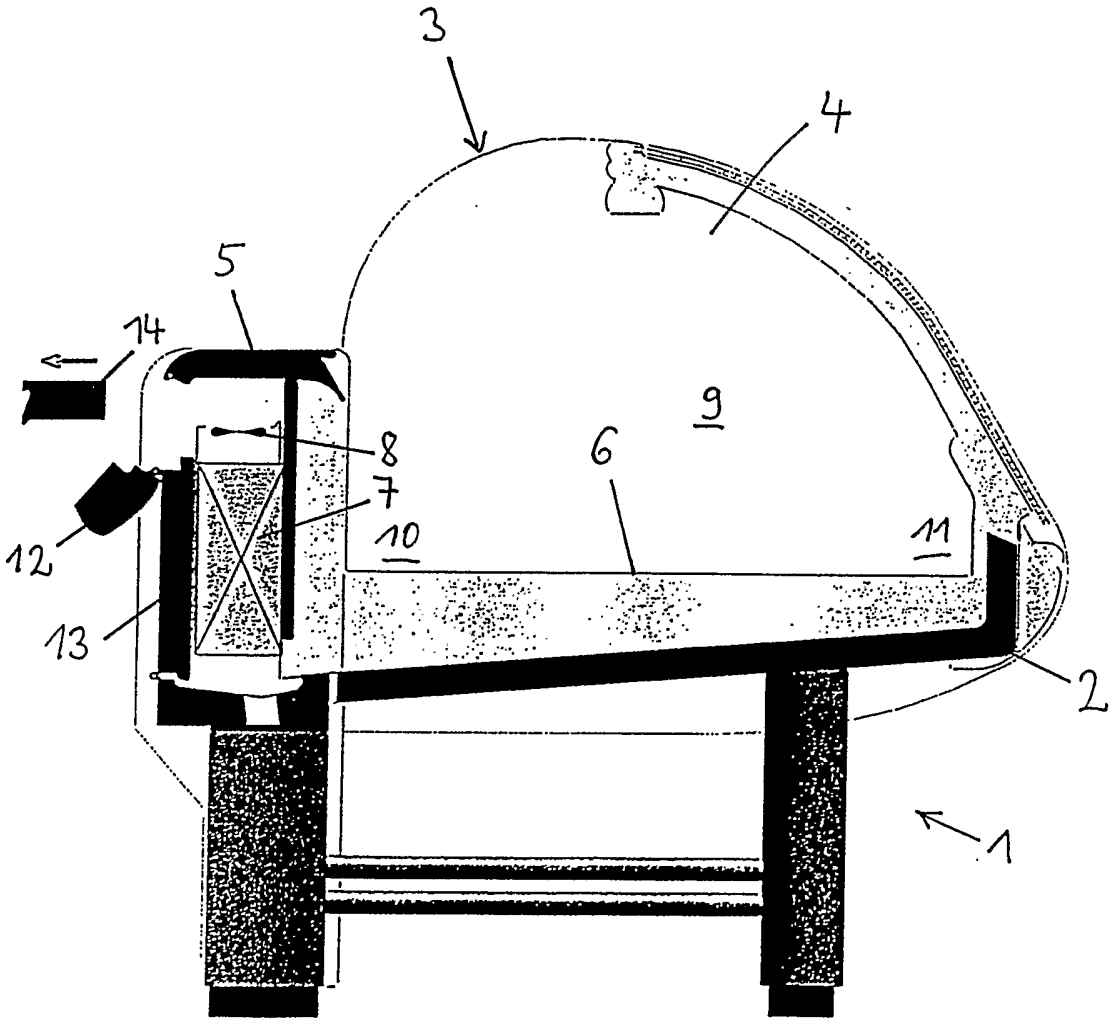


Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A47F3/04 F25D23/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A47F F25D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	US 6 237 350 B1 (HERTEL G&UUML ET AL) 29 May 2001 (2001-05-29) column 3, line 24 - column 5, line 67; figures 1,2	1-12
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Y	paragraph '0015! - paragraph '0044!; figures 1-4	2-4,6,7, 9-12
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
11 October 2005	19/10/2005

Name and mailing address of the ISA	Authorized officer
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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