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(54) **SECTORIZED COOLING ARRANGEMENT FOR REFRIGERATORS**

(57) A sectorized sub-zero cooling arrangement for refrigerators with direct access to the consumer products without having to open other cold storage chambers of the refrigerator.

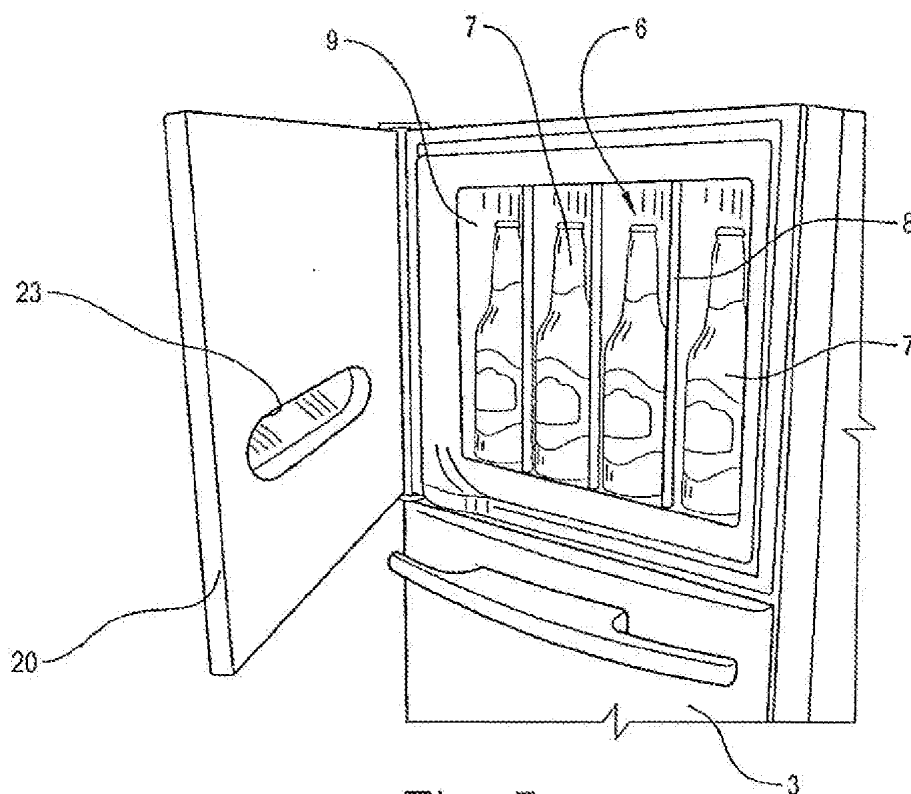


Fig. 5

Description

STATE OF THE ART OF THE INVENTION

Field of the invention

[0001] This invention is related to the field of appliances, devices, apparatus and arrangements for home, public, industrial use, etc. for cooling of products or packaging containing products, preferably of mass consumption such as beverages and more specifically beer containers. In brief, the invention is a method for selective, sectorized cooling of these products mainly in domestic refrigerators.

Prior state of the art

[0002] Refrigerators for general products whether for industrial, domestic or public use, dispensers, etc. consist of an insulated box that contains what is known as a cold storage or cooling chamber in the interior. In domestic refrigerators the interior of this box is usually divided into two parts : one part for cooling products in general (mainly foodstuffs) in the main chamber which is fitted with a main access door, and another part above or below the first devoted to more intense cooling (freezing) of certain special products. The freezer is usually smaller than the general section and may reach temperatures as low as -25 °C, while the in the main or general chamber the temperature will normally range between 5 and 8 °C, sufficient for the type of products stored in the same.

[0003] For certain products, however, neither of these temperature regimes is the most suitable to condition them for consumption. For example, beer is a typical product that, in accordance with the customs of some countries, particularly in the Americas, is consumed at subzero temperatures (below the 5°C of the main refrigerator chamber but above the -25°C of the freezer).

[0004] There are refrigerators designed to generate and maintain the desired temperatures for products such as beer, but they are special cold storage facilities for specialised premises such as restaurants, bottle stores, etc. However, domestic refrigerators adapted to or that have special compartments for conditioning beer and other products at sectorized temperatures and which provide easy, quick and selective access to said products are unknown in the current state of the art.

[0005] For that reason, a new arrangement either factory-fitted or adapted to existing domestic refrigerators would be a valuable convenience. It would enable conservation of products such as beer containers at the right temperature using the cold-generating capacity of the coldest parts of the cool storage chamber and provide direct access to these products without having to open the other sections of the appliance.

BRIEF DESCRIPTION OF THE INVENTION

[0006] Therefore one object of this invention is to provide a sectorized cooling arrangement for refrigerators that enables creation of a space at the selected and controlled temperatures for products that require it and to provide direct access to these products without having to open other chambers of the refrigerator.

[0007] Another object of the invention is to provide a sectorized cooling arrangement for refrigerators in which the appliance may have one or more doors where at least one of said doors - preferably the one that provides access to the coldest chamber - includes a sectorized compartment to store and conserve the differentiated products.

[0008] A further object of this invention is to provide a sectorized cooling arrangement for refrigerators in which the appliance may have one or more doors where at least one of said doors accesses a cooling chamber of the appliance, where said access door is fitted with multiple consumer product container storage spaces in a compartment with an interior wall that separates it from the aforesaid cooling chamber and which is equipped with at least one air fan/blower able to take air from the cooling chamber and conduct it to said container storage space sector to reach and maintain one or more preselected temperatures.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Various figures have been included to provide greater clarity and understanding of the object of the invention. These figures, submitted for purely illustrative purposes, represent the invention in one of its preferred forms, where:

Figure 1 shows a domestic refrigerator with two doors, one lower or main door for the main cold storage chamber and an upper door for access to the freezer. In the drawing, this refrigerator is fitted with the sectorized cooling arrangement of the invention. Figure 2 shows a frontal view of the freezer door separated from the refrigerator and fitted with the sectorized cooling arrangement of the invention.

Figure 3 shows the freezer door separated from the refrigerator and fitted with the sectorized cooling arrangement of the invention seen from above.

Figure 4 shows a perspective view of the freezer fitted with the sectorized cooling arrangement of the invention with the door open in its primary function of access to the freezing compartment.

Figure 5 shows a perspective view of the freezer fitted with the sectorized cooling arrangement of the invention with the door open in its secondary function of access to the compartment that stores the containers to be cooled.

Figure 6 shows an exploded view of the freezer fitted with the sectorized cooling arrangement of the in-

vention.

Figure 7 shows a perspective view from above of a cross-section of the freezer door fitted with the sectorized cooling arrangement of the invention.

Figure 8 shows a side view cross-section of the invention in which the circulation direction of cold air can be seen.

DETAILED DESCRIPTION OF THE INVENTION

[0010] Now with reference to the figures, it can be seen that the invention consists of a new sectorized cooling arrangement of selected and controlled temperatures for products that so require, particularly beverages, and more specifically beer, enabling the same to be deposited and extracted without opening other cold storage chambers and thus avoiding intake of warm air to the same that could be detrimental to other products.

[0011] Thus, according to Figures 1 to 8, the arrangement of sectorized cooling of the invention can be used in a refrigerator 1 of the type having a main cooling compartment 2 with a main access door 3 to said main compartment 2 and a freezing compartment 4 with an access door 5 to the same. Said access door 5 has a sectorized compartment with multiple storage sectors 6 for containers 7 of consumer products, which are defined by multiple partition walls 8 forming separate storage spaces 9 for said containers 7, best illustrated in Figure 5.

[0012] Each of said separate storage spaces 9 for said containers 7 can be fitted with an extractor/blower 10 which may be a fan, wherein each extractor/blower 10 has a suction side upstream of said cold storage chamber 4 and an impulsion side downstream of said sectorized compartment, thus enabling entry of cold air to the inside of the storage spaces 9 in order to maintain the containers placed therein at a low temperature. Said sectorized compartment is provided with an inner wall 11 which separates it from said cold storage chamber 4 and multiple slots 12 through which a current of cold air is conducted from the cold storage chamber to the sectorized compartment.

[0013] The arrangement of the slots 12 as illustrated in Figure 6 does not imply that the invention is limited to this layout. Other arrangements could be considered, such as slots 12 on the upper, lateral or lower part of the inner wall 11 without any difficulty whatsoever. Thus the cold air enters through the slots 12 and flows into the top of the storage spaces 9 where the extractors/blowers 10 are arranged so that they maintain the temperature of the drinks containers. The air then returns to the cold storage chamber through the bottom of the storage space 9, best shown in Figure 8. Alternatively, however, and to facilitate the circulation of cold air, each storage space 9 may have at least one slot (confirm if so) in any of the walls.

[0014] Moreover, said sectorized compartment is formed by a structure defined by multiple frames 13, 14, 15 and 16 mounted on their respective "L" profile lateral

brackets 17, lower bracket 18 and top bracket 19 so that said compartment is closed off from the cold storage chamber by said inner wall 11 and closed off from the exterior by a front panel 20 of said at least one access door 5 of the refrigerator 1.

[0015] Said front panel 20 of the access door 5 of the refrigerator 1, said compartment structure and said inner wall 11 form a pivoting assembly in the refrigerator 1 through at least one first opening hinge 21 for access to the cold storage chamber 4 while said front panel 20 of the access door 5 of the refrigerator is pivotally connected to said compartment structure by at least one second opening hinge 22 of the access door to the sectorized compartment where the containers 7 are stored.

[0016] In accordance with Figures 1 to 5 the first hinge 21 is illustrated in the upper right corner of the refrigerator 1 while the second hinges 22 are located on the left side of the sectorized compartment. This arrangement of the hinges 21 and 22 entails that the access door can be opened to the right for access to the cold storage chamber 4 or to the left to access the sectorized compartment where the containers 7 are stored. However, this arrangement of the hinges is merely illustrative and does not constitute a limit to the invention since the hinge arrangement may vary depending on the manufacturer and the specific requirements of each client, thereby enabling the access door 5 to be opened either to the right or left to access the cold storage chamber, and the sectorized compartment will then be opened by the complementary movement. That is, the access door 5 of this invention may have the following opening setups :

- Opening to the right to access to the cold storage chamber and opening to the left to access the sectorized compartment, or;
- Opening to the left to access the cold storage chamber and opening to the right to access the sectorized compartment.

[0017] While opening the access door to the left or right to access the cold storage chamber with subsequent opening left or right to access the sectorized compartment has been explained, this does not imply that the invention is limited to these configurations. The invention also considers opening the access door upwards or downwards for access to the cold storage chamber with the correlative opening downwards or upwards to access the sectorized compartment.

[0018] It is emphasized that said at least one access door 5 with sectorized compartment is the freezer door. Likewise, said sectorized compartment may be fitted with at least one temperature sensor (not shown) while said front panel 20 may have at least one window 23 providing visual access to said consumer products stored in the storage spaces 9 of the sectorized compartment. Said window 23 assembly employs a transparent sheet 24 which may be glass or any well known plastic material used in the field of the art.

[0019] The front panel 20 is mounted in turn on said compartment structure by means of a top cover 25, bottom cover 26 and said second hinges 22 which are fixed to said top cover 25 and bottom cover 26. Said front panel 20 is fitted with at least one grip/opening device 27 to facilitate opening/closing thereof and at least one temperature indicator screen 28 inside said sectorized compartment. It is emphasized that said main access door 3 also has a grip /opening device 29 to facilitate opening/closing thereof.

[0020] Thus the sectorized cooling arrangement of this invention for refrigerators is described and illustrated. To sum up, it creates a selected and controlled temperature space for products that so require with direct access to the same without requiring other cold storage chambers of the appliance to be opened. It may be added that the invention does not reduce the available space for storage of products and nor does it change the cooling consumption category since it uses the same standard cooling source of any refrigerator.

Claims

1. A sectorized cooling arrangement for refrigerators of the type that has at least one access door to at least one cold storage chamber **characterized in that:**

said access door is provided with a sectorized compartment with multiple storage sectors for containers of consumer products, said compartment being equipped with a partition wall that separates it from said cold storage chamber and at least one air extractor/blower with said cold storage chamber on the upstream side and said sectorized compartment on the downstream side.

2. The sectorized cooling arrangement for refrigerators according to claim 1, **characterized in that** the refrigerator has a main cooling chamber with a main access door to said main chamber and a freezing chamber (freezer) with an access door to the same and said at least one door with said sectorized compartment is the freezer door.

3. The sectorized cooling arrangement for refrigerators according to claim 1, **characterized in that** said compartment has multiple partition walls that form separate storage spaces for said containers.

4. The sectorized cooling arrangement for refrigerators according to claim 1 **characterized in that** said at least one extractor/blower is a fan.

5. The sectorized cooling arrangement for refrigerators according to claims 3 and 4 **characterized in that**

each of said separate storage spaces for said containers is equipped with an extractor/blower.

6. The sectorized cooling arrangement for refrigerators according to claim 1, **characterized in that** said compartment is formed by a compartment structure that is closed off from the cold storage chamber by said wall and closed off from the exterior by a front panel of said at least one access door of the refrigerator.

7. The sectorized cooling arrangement for refrigerators according to claims 1 and 6, **characterized in that** said front panel of the refrigerator door, said compartment structure and said inner wall form a pivoting assembly in the refrigerator by means of at least one first opening hinge for access to the cold storage chamber while said front panel of the access door of the refrigerator is pivotally connected to said compartment structure by at least one second opening hinge of the access door to the sectorized compartment.

8. The sectorized cooling arrangement for refrigerators according to claim 1, **characterized in that** said cooling chamber has at least one temperature sensor.

9. The sectorized cooling arrangement for refrigerators according to claim 1, **characterized in that** said at least one refrigerator door has a visual access window to said consumer products stored in the compartment storage spaces.

10. The sectorized cooling arrangement for refrigerators according to claim 9, **characterized in that** said at least one refrigerator door is fitted with an indicator screen that shows the interior temperature of said compartment.

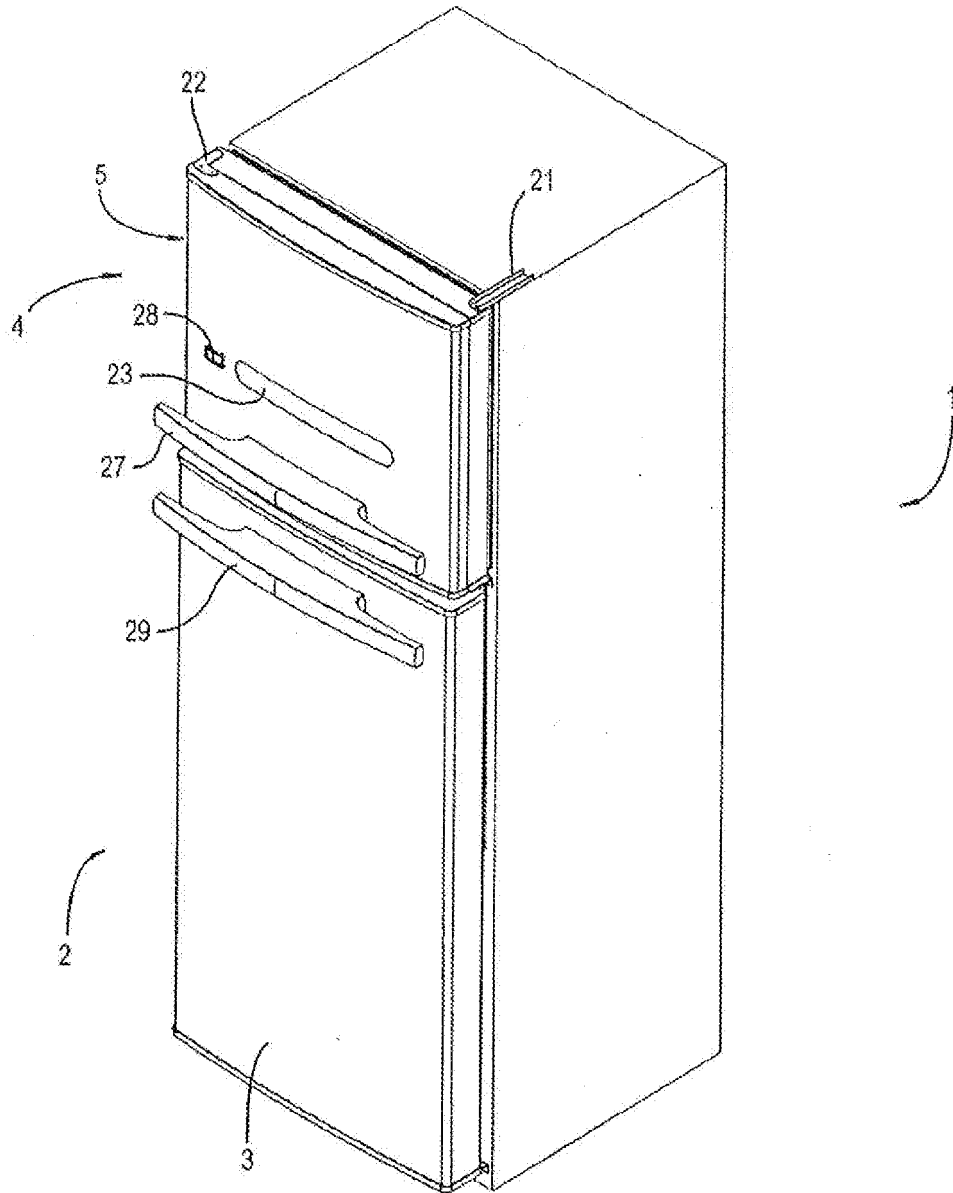


Fig. 1

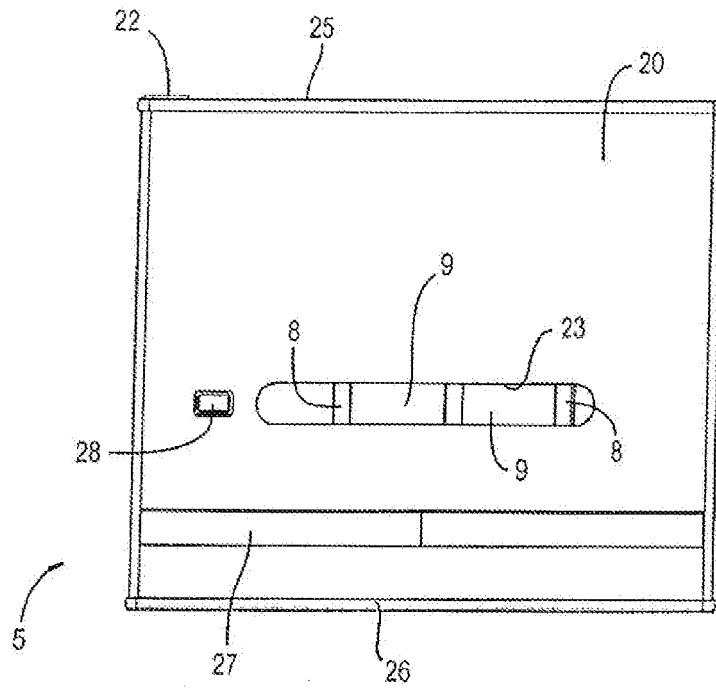


Fig. 2

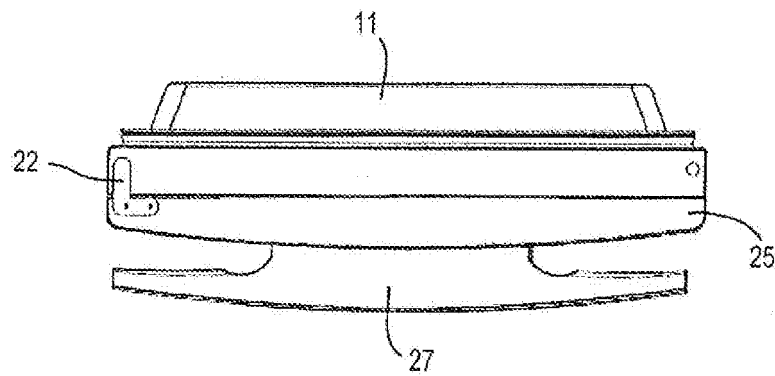


Fig. 3

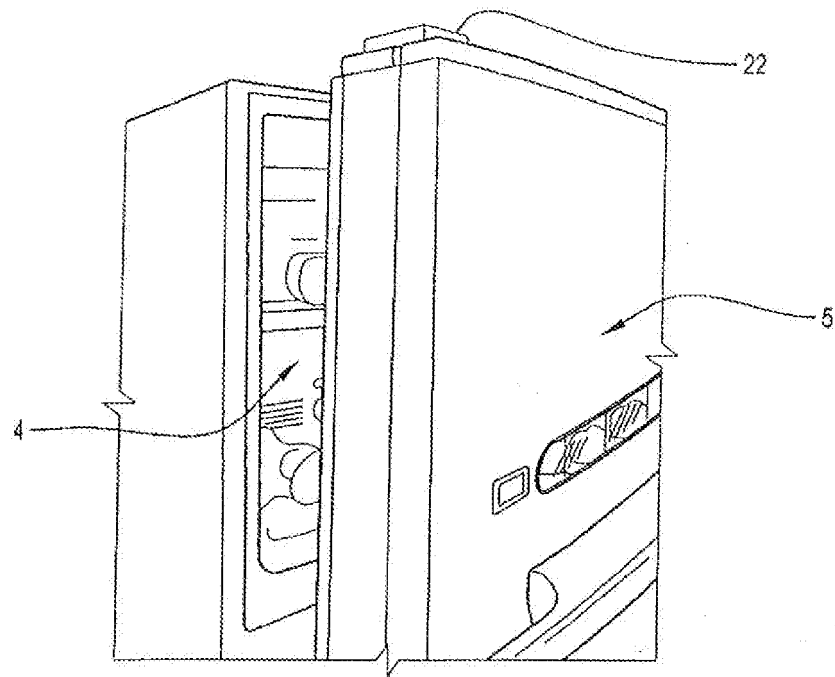


Fig. 4

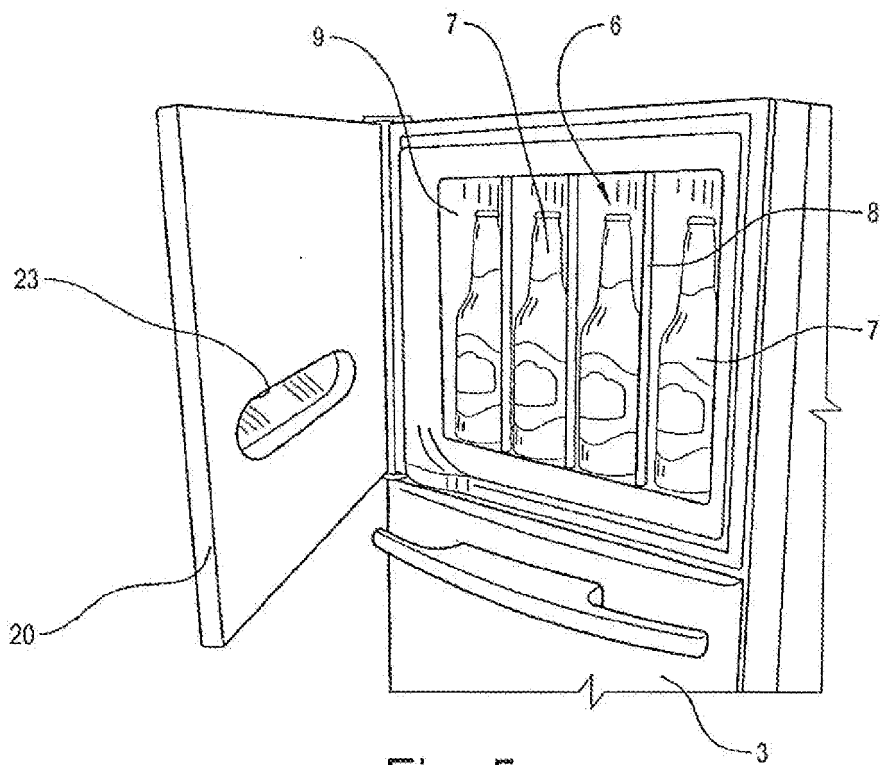


Fig. 5

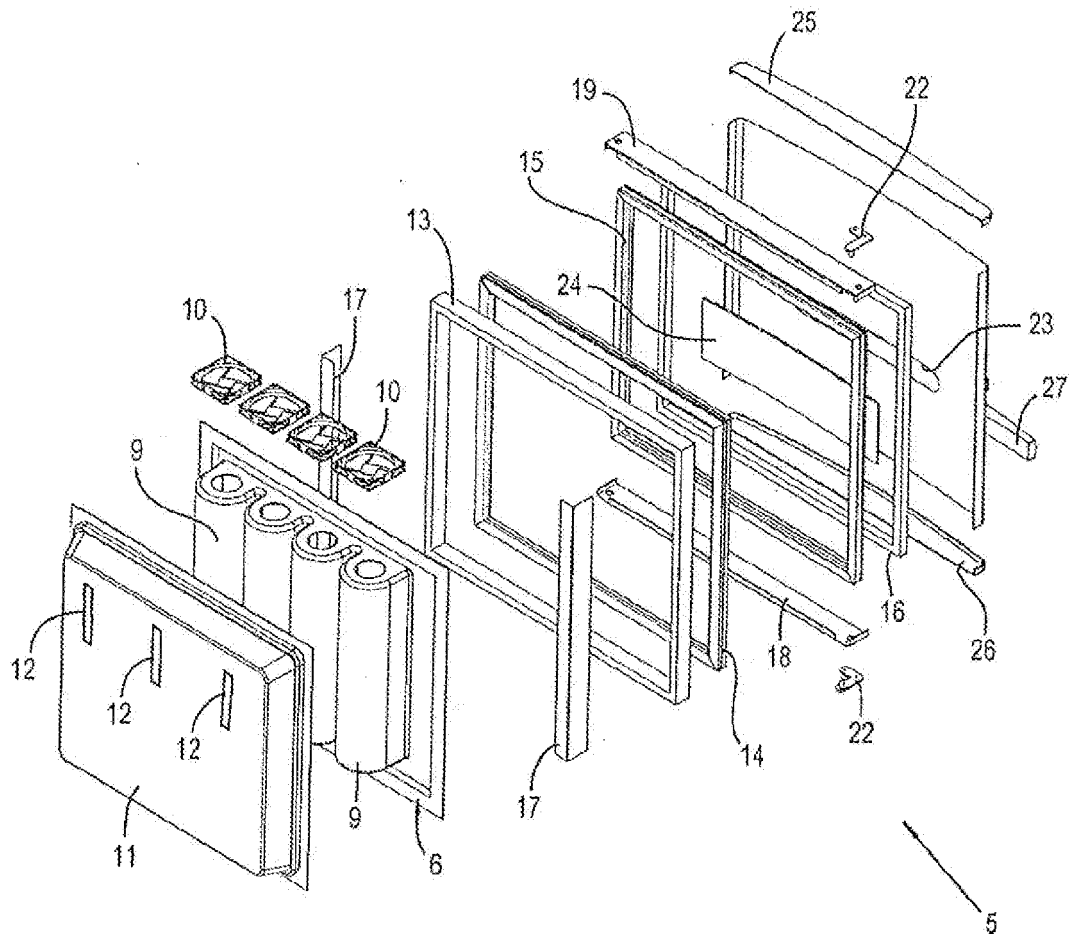


Fig. 6

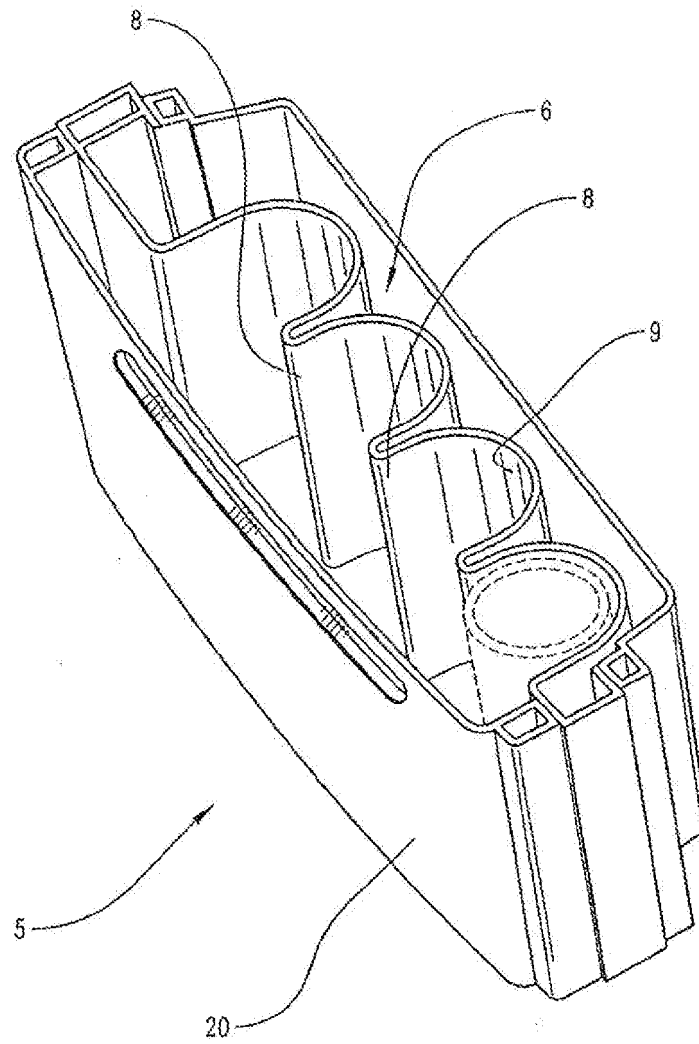


Fig. 7

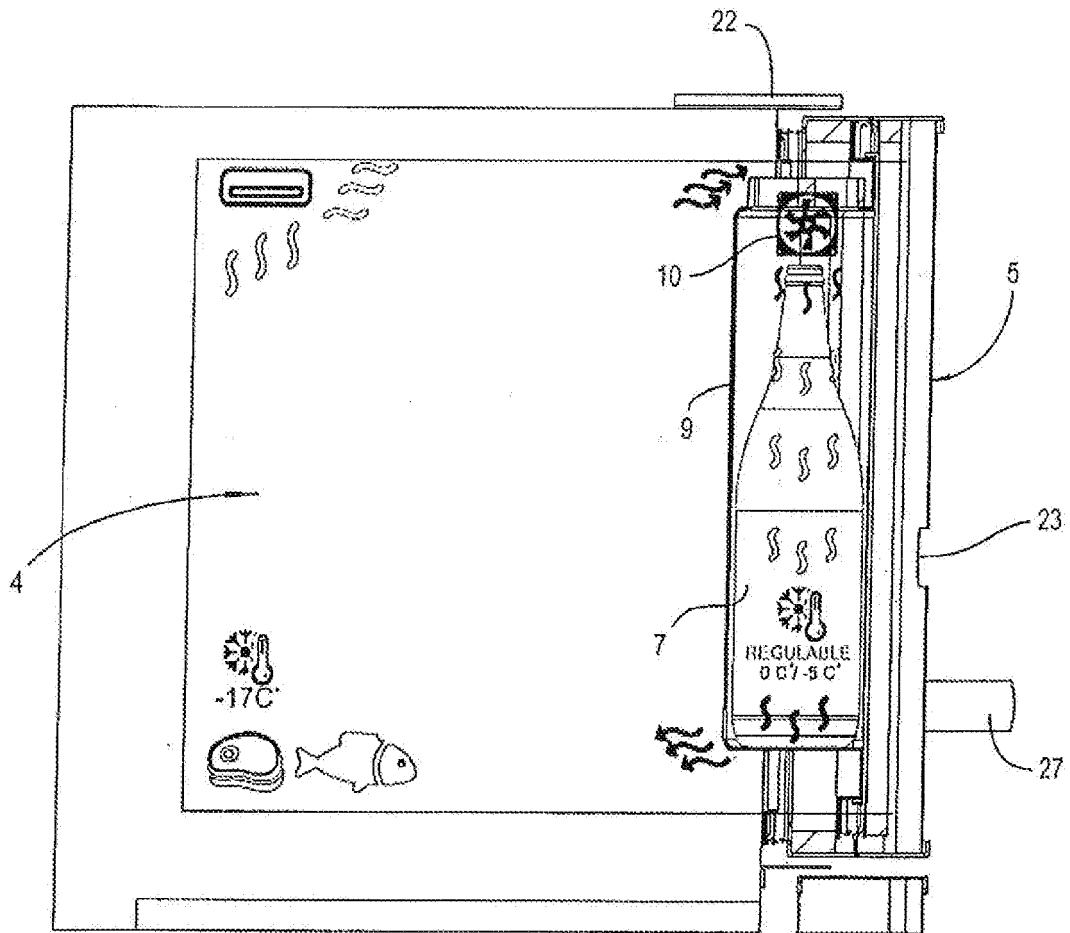


Fig. 8

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2016/051714

A. CLASSIFICATION OF SUBJECT MATTER

INV. F25D23/04

ADD.

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)

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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

29 September 2016

Date of mailing of the international search report

10/10/2016

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2016/051714

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

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