

INTELLECTUAL PROPERTY OFFICE OF SINGAPORE
PATENT AGENTS QUALIFYING EXAMINATION (QE) 2005

PAPER C: INFRINGEMENT AND VALIDITY OF SINGAPORE PATENT
12 October 2005, Wednesday
1400 – 1730 hrs

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INSTRUCTIONS TO CANDIDATES

1. This Paper consists of 24 pages, including this cover page.
2. 30 minutes of reading time is provided. Notes taken on loose sheets are allowed during the reading time.
3. Write your answers in English. Answers in any other language will not be marked. Answers in illegible handwriting will not be taken into consideration.
4. Only your answers and/or drawings to the question(s) written or glued in the Answer Booklet(s) provided by the Examination Secretariat will be considered. You are to write on one side of each sheet in the Answer Booklet (s).
5. Marks are awarded more for the points selected for discussion and reasoning displayed than for conclusions reached.
6. You should accept the facts given in the papers and not use any special knowledge you may have. Assume also that the prior art given is exhaustive.

To be continued

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7. Advise the client on infringement and validity of his patent and on the other questions asked by him. Your advice can be in the form of notes or a letter to the client but in either case you must provide the reasons for your advice.
8. The documents provided in the question are:
- (a) Document A – Letter from your Client (1 page);
 - (b) Document B – Letter from Frezors GmbH (1 page);
 - (c) Document C – Singapore Patent 6000 (5 pages of description plus claims and 2 pages of drawings);
 - (d) Document D – Brochure of Frezor Product (2 pages of description and 2 pages of drawings);
 - (e) Document E – Extract from GB 1,000,000 (1 page of description and 1 page of drawing);
 - (f) Document F – Extract from GB 1,500,000 (2 pages of description plus drawing);
 - (g) Document G – WO 04/10000 (2 pages of description plus claim and 2 pages of drawings).

End

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Document A - Letter from your Client (1/1)

Dear Patent Agent,

- 5 You may remember that last year you filed a Singapore patent application in the name of our company ("Expert Pte Ltd"). It has just been granted, as Singapore patent 6000.

- To be honest, this patent was just for a goofy idea by one of our engineers.
- 10 Refrigeration technology has nothing to do with our company's core business area, and our business plan does not encompass entering the refrigeration industry. However, we happened to find out recently that a large German company (Frezors GmbH) has been aggressively marketing to Singapore supermarkets a product called "Frezor". This seems to me to infringe our patent. I wrote to the head of
- 15 Frezors to point this out, and his response is enclosed. It is not particularly encouraging.

Have you any comments before I respond? Can you see any way to improve our position?

20

Regards,
Client

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Document B - Letter from Frezors GmbH – dated 8 October 2005 (1/1)

Dear Patentee,

- 5 Thank you for your letter of 1 October 2005, alleging that our Frezor product infringes Singapore patent 6000.

However, I must inform you that our patent agent has done a search for earlier technology and is of the view that your patent is clearly invalid in view of the following
10 patent applications: GB 1,000,000, GB 1,500,000, and WO 04/10000.

In any case, our invention antedates your own by several years, and no court will allow you to enforce your patent against us. We built our first prototype devices as early as February 2002, and by 2003 had an entire factory under construction in
15 Frankfurt to produce them. By 1 March 2004 there were several hundred Frezor units in boxes at our Singapore warehouse. Subsequently, a Singapore sales network was recruited to sell the units, and this process was completed by the international unveiling of the product on 15 March 2004.

20 Yours truly,

Frezors GmbH

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Document C - Singapore Patent 6000 (1/7)

Filing date 1 March 2004.

5 No priority Claim.

Title: Refrigerator

Field of the invention

10

The invention relates to refrigerators, particularly for use in supermarkets and other retail establishments.

Background of the invention

15

Many food and drink products have to be stored in a refrigerated or frozen state. Conventionally, they are stored at supermarkets and other retail outlets in refrigerator and freezer cabinets having a cold compartment covered by a transparent door. A ubiquitous example is shown in Fig. 1. An upright refrigerator 1 includes a front door 2 and a cabinet body 3. The door includes a glass front panel 5, and a handle 8 for opening the door. In this process the door swings, so that the edges 4, 6 of the door 2 move away from the cabinet 3. A lower portion 9 of the refrigerator houses a refrigeration mechanism, and an upper area 10 of the door 2 contains space for advertising.

25

This arrangement suffers from several disadvantages ultimately caused by the presence of the door. For example, the supermarket must provide sufficient retail space to accommodate the volume through which the door 2 swings.

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Summary of the invention

5 The inventors of the present patent have become aware that it is possible to partition a volume of air by providing an “air curtain” flowing through it. The air curtain is a region in which there is a rapid (e.g. at least 20cm/s), laminar air flow. Heat and moisture tend not to be transmitted through an air curtain between volumes of air separated by an air curtain.

10

The invention proposes a refrigeration/freezer cabinet having a display volume for storing items of food and/or drink on display. The display volume is open on at least one side, and an air curtain extends across this side, partitioning the display volume from the ambient atmosphere. This makes a separate door unnecessary.

15

Consumers can simply reach through the air curtain to collect their purchases. The air curtain prevents heat in the ambient atmosphere from reaching the display volume.

20

If the air curtain is refrigerated, it gradually absorbs heat in the display volume, thus refrigerating the food and drink items.

25

There may in fact be plural air curtains, all covering the same open side, so that the display volume is protected to a greater extent. One or more of the air curtains may be endlessly circulating streams of air.

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Summary of the Figures

- 5 An embodiment of the invention will now be described with reference to the following drawings:

Fig. 1 shows a known refrigerator;

- 10 Fig. 2 is a cross-sectional view of a refrigerator according to an embodiment of the present invention.

Detailed Description

- 15 The embodiment is shown in cross-section in Fig. 2. Within a cabinet 1 is located a cold compartment having a rear wall 2, and shelves extending from the rear wall. The front of the cabinet is open. However, three parallel laminar air curtains A, B, C each extend over the whole of the open area. The region between the air curtain A and the rear wall 2 constitutes a display volume, such that items on sale can be
20 placed on the shelves.

- Air curtain A involves air circulated by a fan 8 along a circular path through piping 4 beneath, behind and above the cold compartment. The path includes a cooling unit 7 for cooling the air. The piping 4 terminates in a nozzle 4a which generates the
25 laminar flow A. The air in the laminar flow is then recaptured by the mouth 4b and passed back into the piping 4. Heat from the display volume will gradually enter the air curtain A, to be removed by the cooling unit 7. A thermostat is provided to keep the temperature in the display volume at a selected temperature (to within a suitable tolerance). At the same time, the air curtain A provides a barrier preventing heat and

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moisture passing towards the display volume from the left (as seen in Fig. 2) of the air curtain A.

5

Air curtain B involves air circulated by a fan 9 along an endless path through piping 5 beneath, behind and then above the piping 4. The piping 5 terminates in a nozzle 5a which generates the laminar flow B. The air in the laminar flow B is then recaptured by the opening 5b, and passed back into the piping 5.

10

Additionally, air is sucked from the ambient atmosphere by a fan 11, passed along piping 10, expelled as a laminar flow by nozzle 10a, to produce air curtain C. Since this air flow does not circulate endlessly (the air in air curtain C is just expelled from the device), it is preferably not refrigerated.

15

The lower part of the front of the cabinet is shaped 3a, 3b to ensure that flow C is expelled, and that flows A and B enter the mouths 4b, 5b respectively.

20

Optionally, a lamp (such as a fluorescent lamp) may be mounted on the upper front of the cabinet, to illuminate the display volume.

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Claims

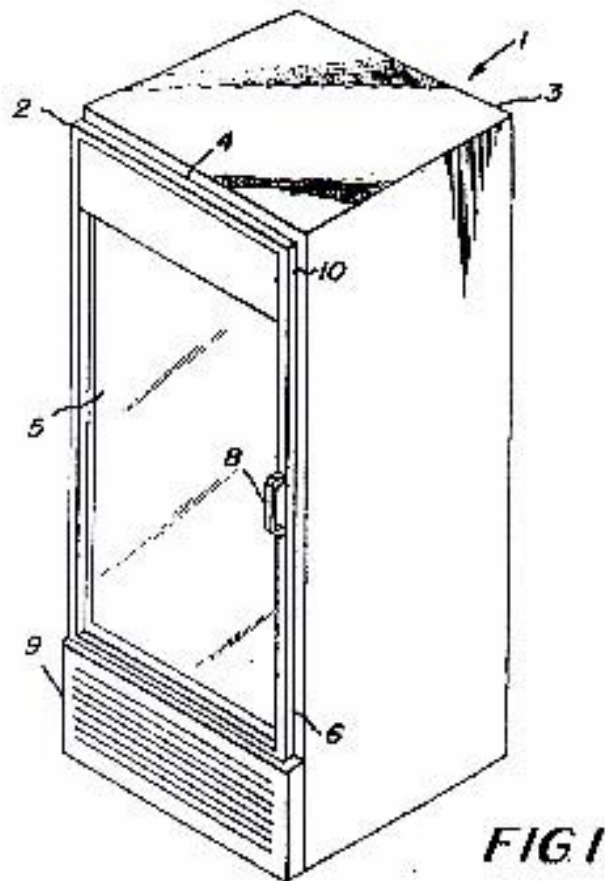
- 5 1. A refrigeration/freezer cabinet having:
 a cabinet defining a display volume for storing items of food and/or drink on
 display, the display volume being open on at least one side, and
 means for generating an air curtain extending across said open side, and
 partitioning the display volume from the ambient atmosphere.
- 10 2. A cabinet according to claim 1 in which the display volume includes a number
 of shelves for storing items on display, the shelves being mounted on a rear portion
 of the cabinet.
- 15 3. A method of displaying items, comprising locating them in the display volume
 of a cabinet according to claim 1.

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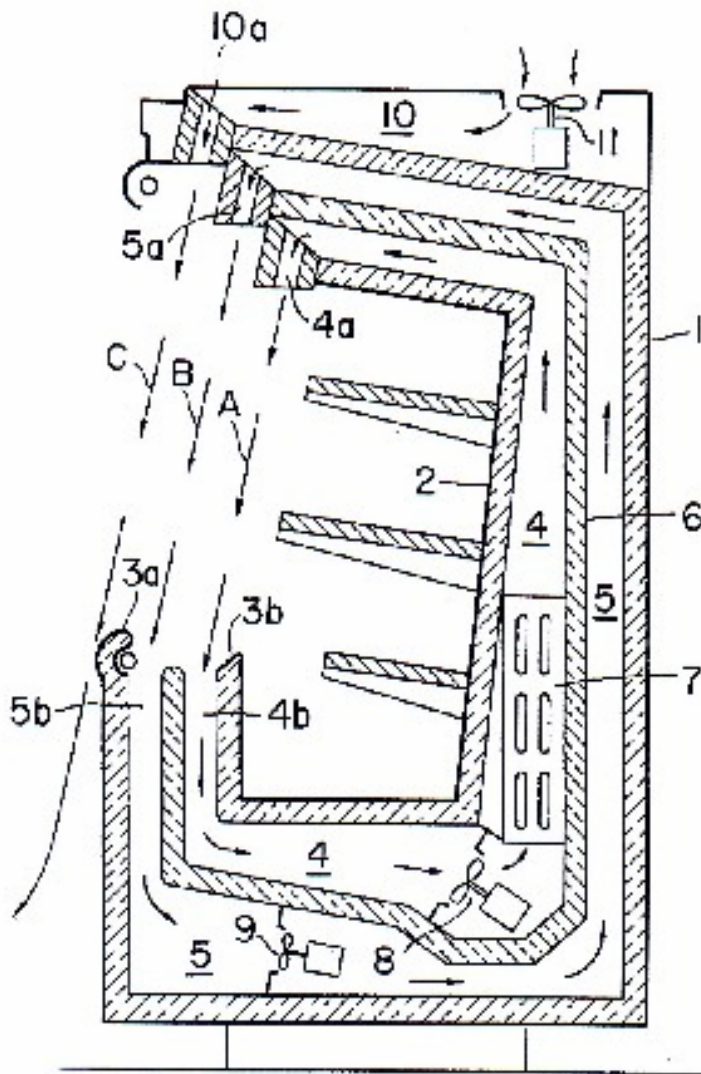
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FIG. 2



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Document D - Brochure of Frezor Product (1/4)

Welcome to the Frezor – a refrigerated display cabinet like no other!

5 As shown in FIGS. 1 and 2, the Frezor is a refrigerated display cabinet 1. The cabinet includes a body composed of a heat insulating wall 2 with an upper opening 2A. A partition 3 is located over the heat insulating wall 2 to define a storage chamber 4. The storage chamber has a rack 4A slanted downwardly toward the front of the display cabinet 1.

10

An inner wall surface of the heat insulating wall 2 and the partition plate 3 jointly define between them a cooled air passage 5 including a front space 5a, a rear space 5b accommodating a plate-fin refrigerating unit 6 and a lower space 5C accommodating an axial-flow air blower 7 having a propeller fan 7A.

15

A critical portion of the Frezor is the region marked A in Fig. 2. In this region, the cooled air passage 5 includes an outlet 5A defined along a rear edge of the opening 2A for forcibly circulating cooled air from the refrigerating unit 6 in the direction of the arrows (FIG. 2) by means of the air blower 7. The outlet 5A is shaped to form an air curtain AC across the opening 2A for cooling the storage chamber 4, and preventing ingress of heat and moisture from the ambient atmosphere. An inlet 5B is disposed in confronting relation to the outlet 5A for receiving the air curtain, and directing the air flow into the front space 5a. Thus, the air circulates endlessly.

20

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Document D (2/4)

Designated at 8 is a drain pipe disposed on a bottom wall 2b of the heat insulating wall 2, 9 a base supporting the heat insulating wall 2 therein, and 10 a humidity sensor positioned in the front space 5a of the cooled air passage 5 in the vicinity of the inlet 5B for controlling a humidifier unit. A plurality of upstanding columns 11 of metal are attached to a rear wall 2c of the heat insulating wall 2 and spaced at intervals. To upper ends of the columns 11, there are attached: an inner top wall 13A of metal having a fluorescent lamp 12 mounted on a front lower edge thereof for illuminating the storage chamber 4; and an outer top wall 13B of metal.

Two mirrored panels 14 are provided which are separable from the rest of the cabinet. The panels 14 are inclined rearwardly at their lower edges. The panels 14 have upper edges releasably supported by an upper edge support 14A fixed to the inner top wall 13A, the lower edges of the panels 14 being supported by a lower edge support 14B fixed to an upper wall 2a of the heat insulating wall 2. The lower edge support 14B has guide paths 14C which serve as slots for insertion of hands at the time of slightly lifting the panels 14 and also as passages for communication pipes.

A dehumidifier unit 15 is mounted on the upper wall 2a of the heat insulating wall 2, using an upper surface of a support 11A (FIG. 2) mounted on the column 11. The dehumidifier unit discharges water using a flexible communication pipe 57 which passes through the guide paths 14c in the lower edge support 14B and across the outlet 5A. From there water falls to be collected by the drain pipe 8.

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Document E - Extract from GB 1,000,000 (1/2)

Filed 2 Jan 1995

5 Published 2 July 1996

A display cabinet refrigerator is disclosed. It is shown in cross-section in Fig. 1. The cabinet includes a base 1a and an upper portion 1, which functions as a refrigerated storage cabinet. The cabinet 1 has a storage space 3 and a front window 5, which
10 can be opened. For example, the window 5 may be connected by a hinge at its upper edge to the rest of cabinet 1.

The cabinet 1 is provided with a refrigeration unit which comprises an evaporator 2 for cooling down the storage space 3 of the cabinet 1, and a compressor and a
15 condenser both of which are disposed in a working chamber within the base 1a. The merchandise storage space 3 is cooled down by forced convection. The air in the storage space 3 is driven through the evaporator 2, disposed at an upper and/or lower portion of the storage space 3, by fan 4 movement. In Fig. 1, the air flow within the storage space 3 is indicated by arrows. The operation of refrigeration unit is
20 controlled by a temperature control device, for example, a thermostat, to maintain the predetermined temperature in the storage space 3.

In this construction of the refrigerated storage cabinet 1, part of the cooled air which is passed through the evaporator 2 strikes against and flows down along the inner
25 surface of the front glass window 5.

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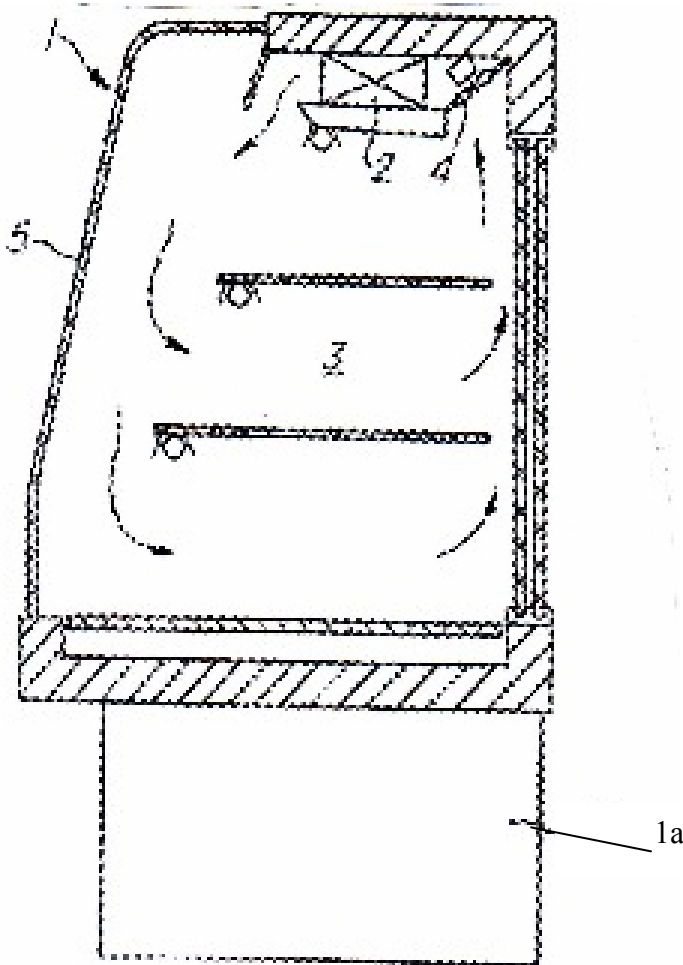


Fig. 1.

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Document F - Extract from GB1,500,000 (1/2)

Filed 1 March 1995

5

Published 1 September 1996

Title: Laboratory workbench

10 Many laboratory experiments are performed on tissue samples in a frozen condition. Conventionally, the tissue is located within vessels which are placed on a refrigerated surface. However, it has been found that diffusion of heat from the ambient atmosphere can still lead to undesirable warming of the samples. Furthermore, moisture in the ambient air may condense on the samples, corrupting
15 them.

While it would be possible to ensure that the samples remain at a low temperature by simply ensuring that the refrigerated surface is sufficiently cold, this may would lead to a vertical temperature gradient through the samples, between the top of the
20 sample (exposed to the ambient atmosphere) and the bottom of the samples (closest to the refrigerated surface).

The present invention proposes a system as illustrated in cross-section in Fig. 1.

25 A cabinet is provided defining a working volume 102 which opens upwardly, and onto which samples to be investigated are placed, e.g. on microscopic slides.

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Parallel air curtains 100, 101 of cooled air are formed over the top of the working
5 volume 102 by evaporators A, B (which cool the air) and fans (not shown). The air
curtains are directed by nozzles 107. The upper air curtain 100 is in contact with the
environmental air and therefore absorbs the majority of the moisture. The inner air
curtain 101 cools the samples in the working volume 102 but is also protected by the
upper curtain 100 from the humid environmental air. This air curtain 101 will be
10 relatively dry and is re-circulated through the evaporator B. The evaporator A draws
in environmental air through a vent.

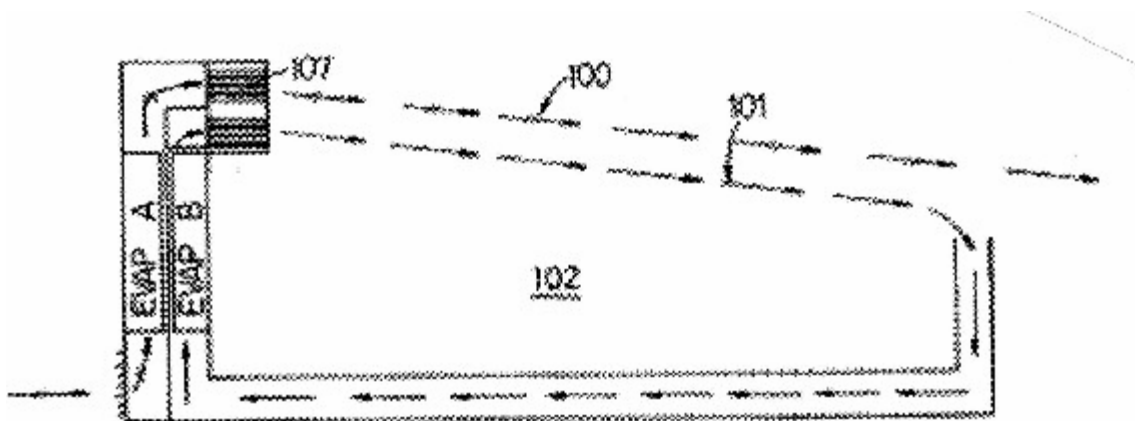


Fig. 1

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Document G - WO 04/10000 (1/4)

Filed 1 June 2003 (without priority claim)

5 Published 1 December 2004

All PCT countries are designated, and the application has not yet entered the Singapore national phase.

10 Title: Refrigeration System.

The present invention is a refrigerator having an air curtain covering a display volume. The air curtain prevents heat and/or moisture entering the display volume.

15 An embodiment A of the invention is shown in Fig. 1 in perspective view. It includes a base 2, a rear portion 3, and a top portion 4. These partially surround a display volume 1, within which are located shelves 5. A number of short plastic sheets 7, separated by gaps 8, depend from the front of the top portion 4.

20 Note that the two ends of the embodiment (i.e. the portions of the embodiment at the ends of the shelves 5) are shown open for the sake of illustration, but more typically they will be closed by panels (not shown), so that only the front side of the display volume 1 is exposed. Thus, the shelves 5 are only accessible from the front of the embodiment, that is from the side furthestmost from the rear portion 3. No doors (or
25 other closure members) are provided extending over the open side of the display volume.

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Referring now to Fig 2, the embodiment is shown in cross-section. The cross-section is in the plane B-B shown in Fig. 1. It will be appreciated that Fig. 2 would appear
5 substantially the same if B-B were replaced by any other parallel plane, between the two ends of the embodiment.

It will be seen from Fig. 2 that piping is defined within the base 2, the rear portion 3 and the top portion 4. A fan (not shown) drives a flow of air in an endless loop
10 indicated by the arrows. This endless loop includes the piping, but also includes an air curtain on the front side of display volume 1. This air curtain covers substantially the whole of the open front side of the display volume. Note that, as the air leaves the upper portion 4 of the embodiment, the plastic sheets 7 direct the air downwardly, ensuring that in this region the air curtain is vertical.

15 As mentioned above, the cross-section of Fig. 2 would be substantially the same whichever plane were chosen parallel to the plane B-B. Thus, it will be understood that the air curtain is substantially uniform along the length of the embodiment.

20 A refrigeration mechanism is provided within the embodiment. This may be of any conventional design, and includes a thermostat for ensuring that the temperature remains within the conventional food display temperature range. Optionally, the circulating air flow may be refrigerated by this mechanism, but this is not required. The air curtain provides a useful barrier to heat and moisture from the ambient
25 atmosphere, even if it is not refrigerated itself.

Claim

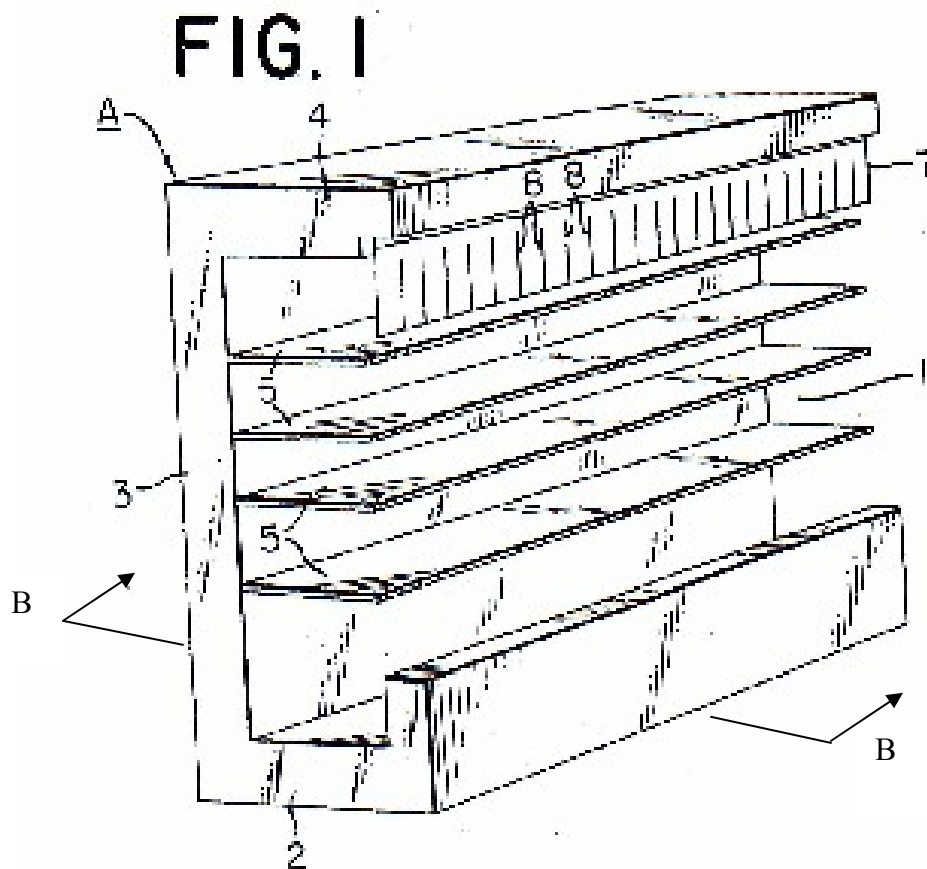
1. A refrigeration system having a display volume protected by an air-curtain.

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Document G (3/4)



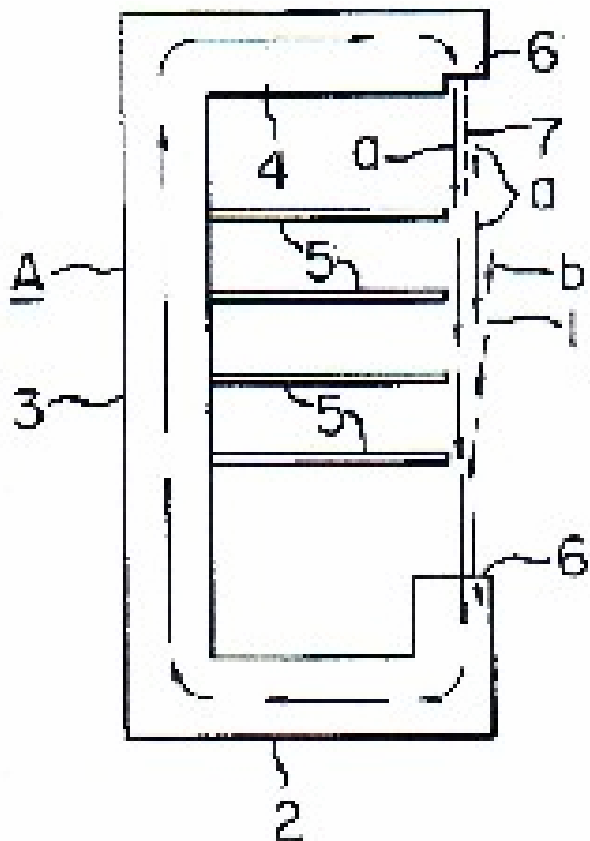
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FIG. 2



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