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(54) **Improved refrigerated exhibitor**

(57) An improved refrigerated exhibitor (1) is disclosed, having a substantially circular or partially arc-shaped plan which is a support structure of a refrigerating cell (5) composed of arc-shaped lateral walls (7), further comprising a door assembly (10) composed of an arc-shaped sliding door (11) equipped with small sliding rollers (14), an arc-shaped upper guide (15) and an arc-shaped lower guide (16) for sliding the sliding door (11) along the arc-shaped lateral wall (7), such arc-shaped lower guide (16) being equipped with an arc-shaped rail (17) for sliding the small rollers (14); a mechanical closing system and a sliding door blocking device (11).

EP 1 703 237 A1

Description

[0001] The present invention refers to an improved refrigerated exhibitor, such as those used in particular for exhibiting beverages or the like.

[0002] As known, there are refrigerated exhibitors equipped with one or more sliding doors: such exhibitors however have a series of inconveniences; in case of exhibitors equipped with a single sliding door, such door needs a supplementary lateral space in which it can slide when opening, with a consequent and clear waste of space; moreover, in case of exhibitors equipped with at least two sliding doors, it is known that such doors, when opening, are overlapped, allowing to access always and only inside part of the exhibitor. In order to solve such problems, the art has provided refrigerated exhibitors with a totally or partially circular plan equipped with arc-shaped sliding doors, so that such doors can slide when opening along the similarly arc-shaped walls of the exhibitor, consequently not needing the lateral space required by traditional sliding doors for their opening. In such exhibitors, however, the use of arc-shaped sliding rails has always created problems or even prevented the use of efficient sealing and insulating systems, such as traditional gaskets or other devices, with consequent negative effects on exhibitors heat efficiency and on related energy consumptions for keeping the desired temperatures.

[0003] The art further provides for refrigerated exhibitors with sliding doors connected to a mechanical closing system comprising a vertically sliding counterweight in a guide which is typically provided along exhibitor opening risers, such counterweight being suitably connected and transmitted to the door so that, when the door is opened, the counterweight rises, while, when the open sliding door is free from constraints, the fall movement of the counterweight due to gravity makes it close; such mechanical system however compels the user who wishes to take foodstuff from inside the exhibitor, to take care, during such operation, to impair the door closure, for example with his hand, arm or shoulder, the door otherwise being closed by itself due to the counterweight fall, thereby being uncomfortable and scarcely useful.

[0004] A counterweight-type mechanical system is typically used only in refrigerated exhibitors with linearly sliding doors, due to the easiness with which it is possible to arrange the transmission cable along the rectilinear opening lintel; in fact, no refrigerated exhibitors are known with arc-shaped sliding doors equipped with a mechanical closing system as previously described.

[0005] Therefore, object of the present invention is solving the above prior art problems, by providing an improved refrigerated exhibitor comprising at least one door assembly with arc-shaped sliding door equipped with a mechanical automatic closing system.

[0006] Another object of the present invention is providing an improved refrigerated exhibitor equipped with a mechanical automatic closing system and a sliding door blocking device.

[0007] Moreover, an object of the present invenzione is providing an improved refrigerated exhibitor comprising at least one arc-shaped sliding door equipped with an improved thermal sealing member.

[0008] The above and other objects and advantages of the invention, as will appear from the following description, are reached with an improved refrigerated exhibitor as claimed in claim 1. Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0009] The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- FIG. 1 shows a perspective view of a preferred embodiment of the improved refrigerated exhibitor according to the present invention;
- FIG. 2 shows a perspective view of the improved refrigerated exhibitor of FIG. 1 free from its external cover;
- FIG. 3 shows an exploded perspective view of the door assembly of the improved refrigerated exhibitor of FIG. 1 and 2;
- FIG. 4 shows an exploded perspective view of a part of the door assembly in FIG. 3;
- FIG. 5 shows another exploded perspective view of a part of the door assembly in FIG. 3;
- FIG. 6 shows a perspective view of a part of the improved refrigerated exhibitor in FIG. 2; and
- FIG. 7 shows another perspective view of a part of the improved refrigerated exhibitor in FIG. 2.

[0010] As it is possible to note with reference to FIGG. 1 and 2, the improved refrigerated exhibitor 1 according to the present invention has a configuration having a substantially circular or partially arc-shaped plan at least in its front part; obviously, the improved refrigerated exhibitor 1 comprises a refrigerating cell 5 contained in a support structure substantially composed of arc-shaped lateral walls 7 defining, above and below the refrigerating cell 5, rooms 9 for housing the refrigerating system components which, since they are known, will not be described below. The support structure is then covered by arc-shaped external covering panels 3 and an upper cover 4. The refrigerating cell 5 interior, containing a plurality of shelves 6 aimed to support the exposed goods, is accessible through a door assembly 10 comprising an arc-shaped sliding door 11, whose radius of curvature is substantially complying with the one of arc-shaped side walls 7, equipped with a mechanical automatic closing system and a blocking device. With particular reference then to FIG. 3, it is possible to note that the door assembly 10 comprises:

- the arc-shaped sliding door 11 preferably composed of an arc-shaped insulating transparent panel supported by an external frame, such frame preferably comprising an arc-shaped lower frame section 12b and two side frame sections, respectively a left one 12c and a right one 12d, the lower frame section 12b being equipped with sliding rollers 14 described below; the arc-shaped insulating transparent panel can obviously, as known, be of the double-later type with internal thermal insulating chamber; moreover, the left side frame section 12c can be equipped with a handle 12 in order to make sliding door 11 opening and closing operations easier, and possibly with a lock (not shown);
- an arc-shaped upper guide 15 and an arc-shaped lower guide 16, suitably connected, as can be seen in particular in FIG. 2, 6 and 7, to the support structure of the improved refrigerated exhibitor 1, substantially above and below the access opening of the refrigerating cell 5, such guides 15, 16 shaped in such a way as to guide the circular sliding of the sliding door 11 around a rotation axis Z between arc-shaped lateral wall 7 and related external covering panel 3; the arc-shaped lower guide 16 further supports an arc-shaped rail 17 for sliding the small rollers 14; the arc-shaped rail 17, as is possible to note in particular in FIG. 5 and 6, is further connected to the arc-shaped lateral wall 7 by interposing small supporting blocks 19; in order to make the sliding door 11 sliding easier, also the upper frame section 12a can be equipped with small rollers 14 adapted to slide along the arc-shaped upper guide 15;
- a sliding door blocking device 11; in particular, such blocking device can be realised as a magnetic plate 18a placed on a bracket 18, externally connected to the arc-shaped lateral wall 7 next to the opening radial limit stroke of the sliding door 11, adapted to be magnetically connected to a respective metallic plate 18b suitably placed along the right lateral frame section 12d; obviously, it is possible to provide for the placement of the metallic plate 18b on the bracket 18 and the magnetic plate 18a along the right lateral frame section 12d;
- a mechanical automatic closing system; with particular reference to FIG. 4, it is possible to note that such system comprises a cable 21, an end of which is connected to the upper frame section 12a, preferably through a connection bracket 23, while the other end thereof is connected, by suitably transmitting the cable 11 through a transmission member 27, to a counterweight, suitably sized depending on the sliding door 11 weight, adapted to vertically slide in a sliding channel 25 placed along the arc-shaped lateral wall 7, preferably next to the sliding door 11 abutment risers: in this way, when the sliding door 11 is opened, the counterweight rides along the sliding channel 25 and the cable 11 is guided in an arc-shaped trajectory by the transmission member 27 and the arc-shaped upper guide 15, in such a way as not to operatively interfere with other door assembly 10 components; at the end of its opening stroke, the sliding door 11 is advantageously kept open by the blocking device, this allowing to easily access the refrigerating cell 5 to take therefrom or place therein goods without having to manually retain it; after having ended all operations, it is enough to unlock the sliding door 11 from the blocking device by applying a slight traction and the fall movement of the counterweight due to gravity drags it towards its closing position.

[0011] As can be seen in particular from FIG. 5, in order to guarantee and improve the thermal seal of the refrigerating cell 5, a vertical rib 28 can be provided, placed under the lower frame section 12b, which by sliding almost in contact with or skimming the arc-shaped rail 17, very highly reduces thermal exchanges and air passage between outside and inside the cell 5, consequently increasing the global thermal efficiency of the improved refrigerated exhibitor 1 according to the present invention. Similarly, also the upper frame section 12a can be equipped with the vertical rib 28.

[0012] Moreover, the upper frame section 12a and possibly the upper 12b and lateral 12c, 12d frame sections can be equipped with an internal net-shaped or honeycomb-shaped structure for structural reinforcement.

[0013] As described, the door assembly 10 members like the sections composing the sliding door 11 frame, the upper 15 and lower 16 guides, the small supporting blocks 19 and the support structure of the improved refrigerated exhibitor 1 can be easily manufactured in plastic material through molding, injection or extrusion, thereby resulting in an inexpensive realisation and an easy assembling, though they keep a high use practicality and a high operating efficiency.

Claims

1. Improved refrigerated exhibitor (1) having a substantially circular or partially arc-shaped plan, comprising a support structure of a refrigerating cell (5) composed of four arc-shaped lateral walls (7), **characterised in that** it comprises:
 - a door assembly (10) comprising an arc-shaped sliding door (11) equipped with small sliding rollers (14), an arc-shaped upper guide (15) and an arc-shaped lower guide (16) for sliding said sliding door (11) along said arc-shaped lateral wall (7), said arc-shaped lower guide (16) being equipped with an arc-shaped rail (17) for sliding said small rollers (14);
 - a mechanical closing system for said sliding door (11); and
 - a blocking device for said sliding door (11).

2. Improved refrigerated exhibitor (1) according to claim 1, **characterised in that** said sliding door (11) comprises an external support frame of an arc-shaped insulating transparent panel, said support frame being composed of an arc-shaped upper frame section (12a), an arc-shaped lower frame section (12b) and two lateral frame sections (12c; 12d), said lower frame section (12b) being equipped with said small sliding rollers (14).
3. Improved refrigerated exhibitor (1) according to claim 1 or 2, **characterised in that** said upper frame section (12a) is equipped with said small rollers (14).
4. Improved refrigerated exhibitor (1) according to claim 2, **characterised in that** said lower frame section (12b) is equipped with a vertical rib (28) adapted to slide when skimming said arc-shaped rail (17).
5. Improved refrigerated exhibitor (1) according to claim 2 or 4, **characterised in that** said upper frame section (12a) is equipped with said vertical rib (28).
6. Improved refrigerated exhibitor (1) according to claim 2, **characterised in that** said lower frame section (12b) is equipped with an internal net-shaped or an honeycomb-shaped structure.
7. Improved refrigerated exhibitor (1) according to claim 2 or 6, **characterised in that** said upper frame section (12a) and/or said lateral frame sections (12c; 12d) are equipped with said internal net-shaped or honeycomb-shaped structure.
8. Improved refrigerated exhibitor (1) according to claim 1, **characterised in that** said arc-shaped rail (17) is connected to said arc-shaped lateral wall (7) by interposing small supporting blocks (19).
9. Improved refrigerated exhibitor (1) according to claim 1, **characterised in that** said blocking device of said sliding door (11) comprises a magnetic plate (18a) placed on a bracket (18), said bracket (18) being externally connected to said arc-shaped lateral wall (7) next to a radial opening limit stroke of said sliding door (11), and a respective metallic plate (18b) placed on said sliding door (11).
10. Improved refrigerated exhibitor (1) according to claim 1, **characterised in that** said mechanical automatic closing system comprises a cable (21), an end of which being connected to said sliding door (11) and another end being connected to a counterweight adapted to vertically slide in a sliding channel (25) along said arc-shaped lateral wall (7).



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EUROPEAN SEARCH REPORT

Application Number
EP 06 00 4177

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) -& JP 2005 009698 A (HOSOI YUJI; HOSOI TERUKO; HOSOI HIROKI; HOSOI YOJI; HOSOI RIEKO), 13 January 2005 (2005-01-13)	1-3,9	INV. F25D23/02 A47F3/04
Y	* abstract * * figures 1-12b * http://dossier1.ipdl.ncipi.go.jp/AIPN/aipn_call_transl.ipdl?N0000=7413&N0120=01&N2001=2&N3001=2005-009698 * paragraphs [0002], [0011] - [0013], [0017], [0021] - [0024], [0033] - [0037] *	4-8,10	
Y	GB 1 287 916 A (BARROERO LOUIS FRANCIS) 6 September 1972 (1972-09-06) * page 2, right-hand column, line 88 - page 3, left-hand column, line 38 * * page 5, left-hand column, line 8 - page 5, left-hand column, line 29 * * figures 1-26 *	4-8	
Y	PATENT ABSTRACTS OF JAPAN vol. 2003, no. 09, 3 September 2003 (2003-09-03) -& JP 2003 148863 A (HOSHIZAKI ELECTRIC CO LTD), 21 May 2003 (2003-05-21) * abstract * * figures 1-6c *	10	
A	US 2 596 316 A (WHITE CHARLES C) 13 May 1952 (1952-05-13) * the whole document *	1-9	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 July 2006	Examiner CORREIA DOS REIS, I
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EUROPEAN SEARCH REPORT

Application Number
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 6 309 034 B1 (CREDLE, JR. WILLIAM S ET AL) 30 October 2001 (2001-10-30) * column 7, line 1 - column 7, line 59 * * figures 5-7 *	1-3	
A	----- PATENT ABSTRACTS OF JAPAN vol. 017, no. 077 (M-1367), 16 February 1993 (1993-02-16) -& JP 04 278165 A (HITACHI LTD), 2 October 1992 (1992-10-02) * abstract * * figures 1-5 *	1-3	
A	----- PATENT ABSTRACTS OF JAPAN vol. 2002, no. 12, 12 December 2002 (2002-12-12) -& JP 2002 228339 A (OTOMO YAYOI), 14 August 2002 (2002-08-14) * abstract * * figure 4 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 July 2006	Examiner CORREIA DOS REIS, I
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

6
EPO FORM 1503 03.82 (F04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 06 00 4177

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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12-07-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2005009698 A	13-01-2005	NONE	
GB 1287916 A	06-09-1972	NONE	
JP 2003148863 A	21-05-2003	NONE	
US 2596316 A	13-05-1952	NONE	
US 6309034 B1	30-10-2001	AT 291868 T	15-04-2005
		AU 1595601 A	06-06-2001
		BR 0015495 A	23-07-2002
		CN 1390101 A	08-01-2003
		DE 60019150 D1	04-05-2005
		DE 60019150 T2	26-01-2006
		EP 1227743 A1	07-08-2002
		ES 2235996 T3	16-07-2005
		JP 2003513688 T	15-04-2003
		MX PA02004321 A	07-11-2002
		WO 0133999 A1	17-05-2001
		US 2001054297 A1	27-12-2001
JP 04278165 A	02-10-1992	NONE	
JP 2002228339 A	14-08-2002	NONE	