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(54) **System for containing food products in horizontal freezers and horizontal freezer provided with such system**

(57) A system for containing food products in horizontal freezers (C) comprises removable baskets (14) and a plurality of support frames (10) capable of being rested on a bottom part of the freezer and having an

upper portion (10c) capable of supporting the baskets in a substantially intermediate position inside the freezer cavity.

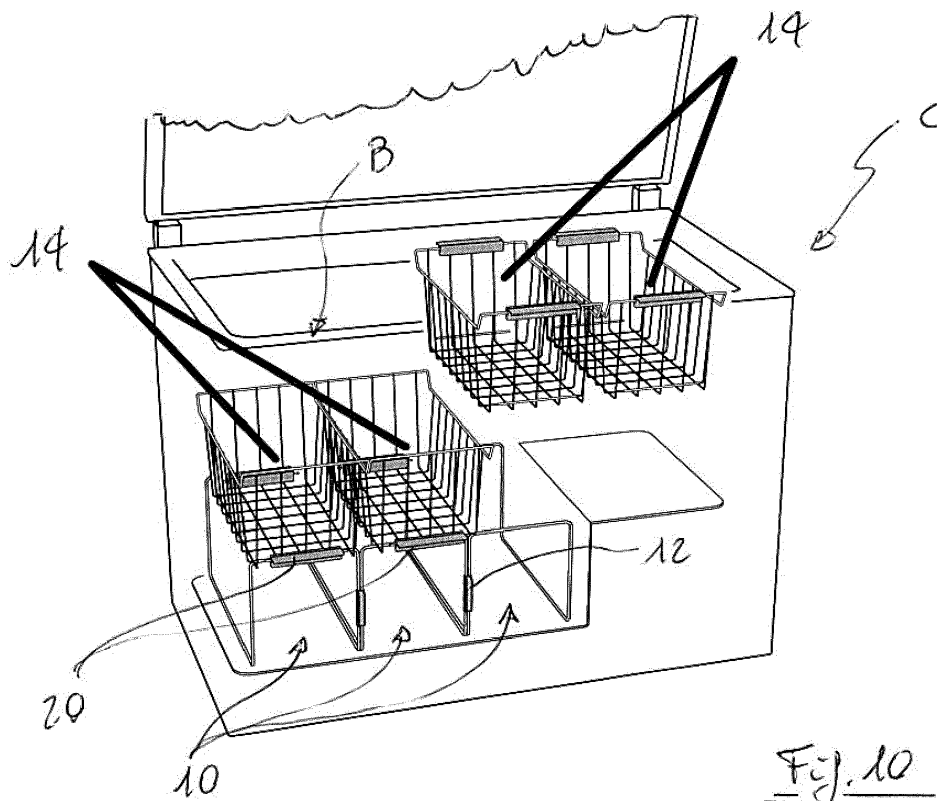


Fig. 10

Description

[0001] This invention relates to a system for containing food products in horizontal freezers, of the type comprising at least one basket.

[0002] There are known food containment systems for horizontal freezers (known also as "chest freezers") in which the baskets, made by means of wires or metal rods shaped and welded together, having integrated handles capable or co-operating with an upper edge of the freezer cavity in order to make use of an upper area of the cavity which otherwise would not be easy to use. In these known horizontal freezers, the user therefore places a first quantity of food products directly on the bottom of the freezer and a second quantity in said baskets. The intermediate area of the freezer is difficult to use without recourse to a sort of upward layering of the food products. This layering has the drawback of making access to the food products placed at the bottom difficult (with the need to remove the intermediate food products one at a time) and of limiting the circulation of air inside the cavity, with a relative reduction in the energy efficiency of the domestic appliance.

[0003] The aim of this invention is to provide a containment system of the type specified at the beginning of the description that allows the above-mentioned drawbacks to be overcome and is simple and economical to produce. According to the invention, this aim is achieved thanks to the characteristics listed in the accompanying claims.

[0004] To make better use of the freezer cavity, particularly of its intermediate loading area, the invention uses support frames also made of shaped metal rods and formed like an upturned "saddle" and in which are defined two straight parallel base portions (horizontal in the configuration mounted inside the cavity) capable of coming into contact with a bottom wall of the freezer cavity and two U-shaped vertical portions like a gantry that continue said horizontal portions and are capable of arranging themselves substantially in contact with the vertical walls of the cavity. On said gantry portions of the frames, preferably adjacent and in contact with each other, baskets are arranged that thus enable a rational and convenient use of the intermediate space of the cavity without limiting the loading capacity of its bottom area (thanks to the very small space occupied by the support frames). The dimensions of the support frames and baskets are chosen so that it is possible, above the baskets supported by the support frames, to position and slide the baskets supported by the upper parallel edges of the cavity.

[0005] The solution according to the invention enables increased circulation of air by convection between the food products for better heat exchange and therefore for faster freezing, particularly for food products that otherwise would be placed in the middle area of the cell simply by stacking them on top of the underlying food products.

[0006] According to a preferred characteristic of the invention, the support frames are joined together two by

two by means of joining devices made of a polymer material, that are easy to snap fit onto two areas of the rod that are vertical and in contact with each other.

[0007] According to another characteristic of the invention, the baskets are equipped with removable handles, of a polymer material for example, to allow the basket to be inserted deep into the cavity without any problem of interference with the vertical walls of the cavity. For this purpose, the quadrangular upper area of the basket is wider than a lower area of the basket so that the handles, once fitted to the upper edge of the basket, can interact with the edges of the cavity, whereas once fitted to the bottom tapered area of the basket, the handles do not interfere with said walls and can rest on the above-mentioned support frames. Another advantage of the present invention is the versatility of the system which makes it possible to choose how many baskets to position in the intermediate area of the cavity and how many in the upper area.

[0008] Further advantages and characteristics of the present invention will emerge from the following detailed description, given purely by way of a non-limiting example, with reference to the accompanying drawings in which:

- Figure 1 is a perspective view of a component of the containment system for horizontal freezers according to the invention;
- Figure 2 is a perspective view of a basket of the containment system according to the invention;
- Figure 3a is an enlarged perspective view of an additional component of the system capable of enabling the assembly of several of the components according to Figure 1 adjacent and in contact with each other;
- Figure 3b is a plan view of the component in Figure 3a;
- Figure 4 is a perspective view of a removable handle to be used with the basket in Figure 2;
- Figure 5 is a perspective view of several of the components in Figure 1 assembled together;
- Figure 6 shows the assembled components of Figure 5 installed inside a horizontal freezer;
- Figure 7 is an enlarged perspective view of the component in Figure 4; and
- Figure 8 is a view that illustrates the fitting of the handle in Figures 4 and 7 in its different positions on the basket;
- Figure 9 is a schematic view that illustrates a configuration of the containment system according to the invention in which only one basket is placed in an intermediate position inside the cavity; and
- Figure 10 is similar to Figure 9 and illustrates the configuration that results when one basket of the configuration in Figure 9 is transferred to the intermediate position after changing the position of the handles as shown in Figure 8.

[0009] With reference to the drawings, 10 shows a support frame made by bending/shaping a piece of plasticised metal rod whose ends are butt-welded together. In particular, the frame 10 has two straight and parallel base portions 10a that extend into four vertical uprights 10b in their turn joined by crossmembers 10c. As clearly illustrated in Figure 6, each frame is designed to rest in a sliding manner, on its parallel portions 10a, on a bottom wall F of a horizontal freezer C. The frames 10 are joined together at their uprights 10b by means of plastic profiles 12 with a substantially U-shaped cross section which are snap fitted elastically onto said adjacent uprights (Figures 5 and 6). In particular, each profile 12 (Figures 3a and 3b) has a pair of adjacent recesses 12a having a diameter substantially corresponding to the diameter of the rod of the frames 10 and a pair of parallel wings 12b that serve to distance the uprights 10b from the vertical walls of the cavity of the freezer C for reasons that will become clear later in the description.

[0010] The baskets 14 (Figure 2) can be rested on the frames 10, said baskets also being made from plasticised metal rod and having a downward tapering configuration. The baskets 14 have at the top a shaped rod 16 that defines the upper edge of the basket and that has two lower parallel portions 16a and two raised parallel portions 16b. In the bottom area of the basket 14, parallel to the raised portions 16b, pieces of rod 18 are welded. To the raised portions 16b or pieces of rod 18 it is possible to fit removable handles 20 of a polymer material (Figures 4, 7). Each handle 20 has a fitting portion 20a with a substantially U-shaped cross section and a flat portion 20b for grip and support. On the fitting portion 20a are a plurality of notches 22 to enable the insertion into them of vertical rods fixed to the rod 16 and to the pieces of rod 18 on fitting the handle 20 to the basket. For this fitting, shown in Figure 8, it is sufficient to align said notches 22 with the vertical rods, exert a light lateral pressure to insert said rods into the notches 22 and then slide the handle 20 longitudinally so as to achieve an elastic snap-fit coupling (thanks to the presence of special locators, not shown, inside the fitting portion 20a). To inform the user of this simple method of assembly, on the flat grip and support portion indications can be provided in the form of arrows or suchlike.

[0011] The handles 20 can be fitted in pairs to the raised portions 16b of the rod 16 or to the pieces of rod 18 located at the bottom of the basket 14. The first fitting configuration is shown for three top baskets in Figure 9, where the handles 20 are resting on the upper edge B of the freezer cavity. The second fitting configuration is shown in Figure 10 for two baskets 14 supported by the crossmembers 10c of as many support frames 10 (and where a third basket is still shown in the first fitting configuration). The second fitting configuration, in which the portions 20b of the handles rest and slide on the support frames 10, is made possible by the above-mentioned tapering of the baskets 14 which enables the handles 20 to be fitted with two different side clearances, as well as

the fact that the uprights 10b of the frames 10 are kept away from the walls of the cavity thanks to the wings 12b of the profiles 12, thus allowing the baskets 14 that rest on the frames 10 by means of the handles 20, converted to guides when fixed to the bottom of the baskets 14, to slide.

[0012] Clearly visible in Figures 9 and 10 is the subdivision of the cavity space into three different areas of depth, thanks in particular to the use of support frames 10 and the tapering of the baskets 14 in combination with the removable and reconfigurable handles 20.

[0013] Clearly, although the support frames and the baskets have been described as made of profiled, welded and plasticised metal rod, it is possible for them to be made entirely of polymer material.

Claims

1. System for containing food products in horizontal freezers (C), of the type comprising at least one basket (14), **characterised in that** it comprises at least one support frame (10) capable of being rested on a bottom wall of the freezer (C) and having an upper portion (10c) capable of supporting said basket (14) in a substantially intermediate position inside the cavity of the freezer (C).
2. System according to claim 1, in which the support frame (10) is made of metal rod or suchlike and has two straight parallel portions (10a) capable of resting on the bottom wall of the freezer (C) and two substantially U-shaped end portions (10b, 10c) at right angles to a plane defined by said straight parallel portions (10a), the basket (14) being supported at said end portions (10b, 10c).
3. System according to claim 1 or 2, in which a plurality of support frames (10) are placed side by side and joined by means of removable connecting elements (12).
4. System according to claim 2, in which each U-shaped end portion (10b, 10c) of the support frame (10) comprises straight parallel uprights (10b) at right angles to said straight parallel portions (10a) and an intermediate crossmember (10c) at right angles to said uprights (10b).
5. System according to claims 3 and 4, in which each removable connecting element (12) comprises an elongated profile, preferably of polymer material, with a substantially U-shaped cross section and capable of being snap fitted elastically onto two adjacent uprights (10b) of adjacent support frames (10).
6. System according to claim 5, in which said removable connecting element (12) has a pair of circular

adjacent seats (12a) having a diameter substantially corresponding to the diameter of the rod of the support frame (10) and a spacer portion (12b) capable of co-operating with a wall of the cavity of the freezer (C) in its configuration fitted on two adjacent support frames (10). 5

7. System according to claim 6, in which said spacer portion of the removable connecting element (12) has a pair of parallel wings (12b). 10
8. System according to any of the preceding claims, in which each basket (14) is equipped with removable handles (20) capable of assuming a first configuration for fitting at the upper edges (16b) of the basket (14) in order to support it on the edges (B) of the cavity of the freezer (C) in a substantially upper position inside said cavity and a second configuration for fitting at the lower areas (18) of the basket (14) in order to support the basket (14) on at least one support frame (10) in a substantially intermediate position inside the cavity of the freezer (C). 15
20
9. System according to claim 8, in which each basket (14) has a tapered shape with a bottom portion smaller than an upper portion in order allow said handles (20) to be fitted in the second configuration without interference with the vertical walls of the cavity of the freezer (C). 25
30
10. System according to claim 8 or 9, in which each handle (20) has a U-shaped fitting portion (20a) integral with a flat grip and support portion (20b), the U-shaped fitting portion being capable of being fitted on horizontal portions (16b, 18) of rods of the basket (14) and having a plurality of notches (22) for insertion at vertical portions of the basket (14). 35
11. System according to claim 10, in which each handle (20) has, within the fitting portions (20a), locating surfaces capable of enabling, after a longitudinal sliding of the handle (20) on the relative horizontal portion (16b, 18) of the basket (14), an elastic snap fit onto the basket (14). 40
45
12. Horizontal freezer (C) provided with a product containment system according to any of the preceding claims. 50
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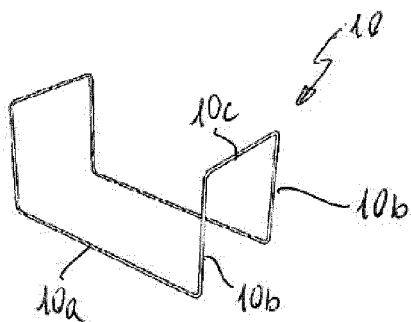


Fig. 1

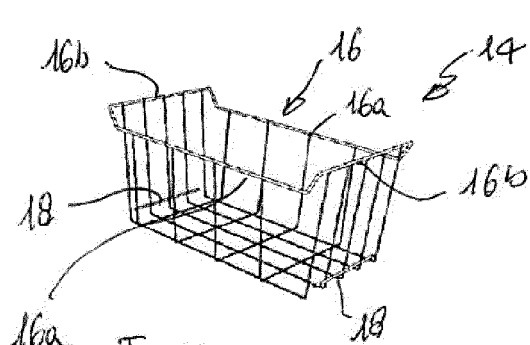


Fig. 2

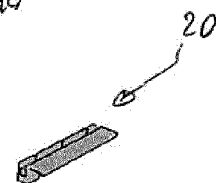


Fig. 4

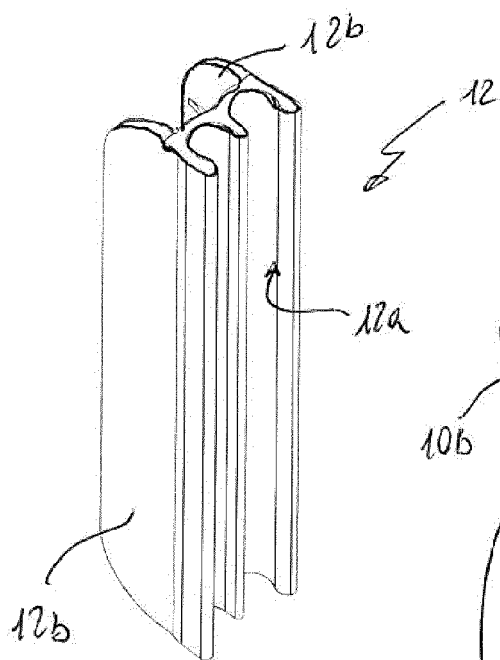


Fig. 3a

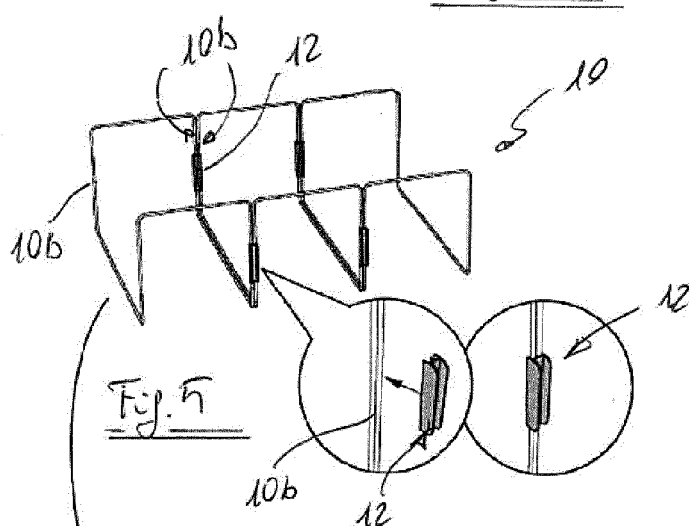


Fig. 5

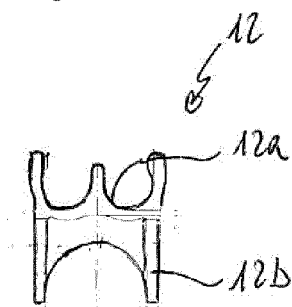
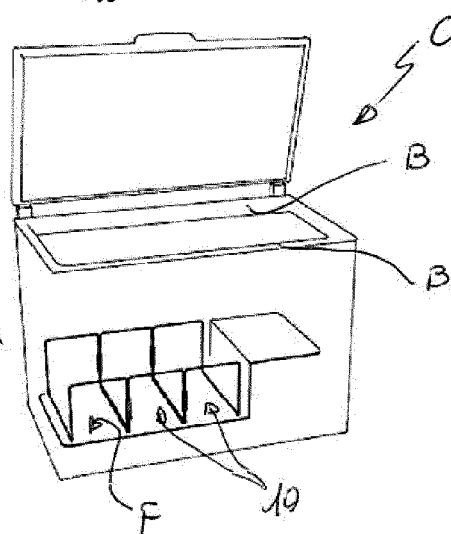


Fig. 3b

Fig. 6



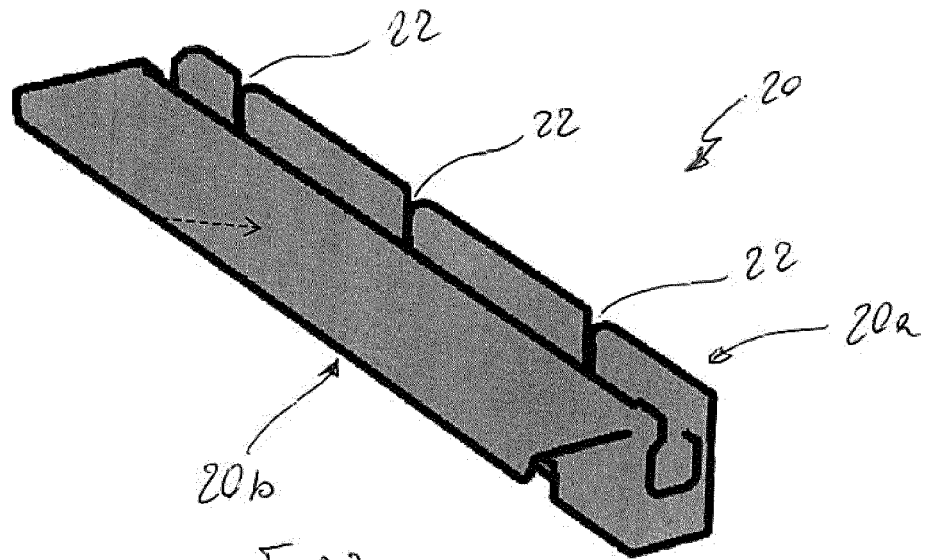


Fig. 7

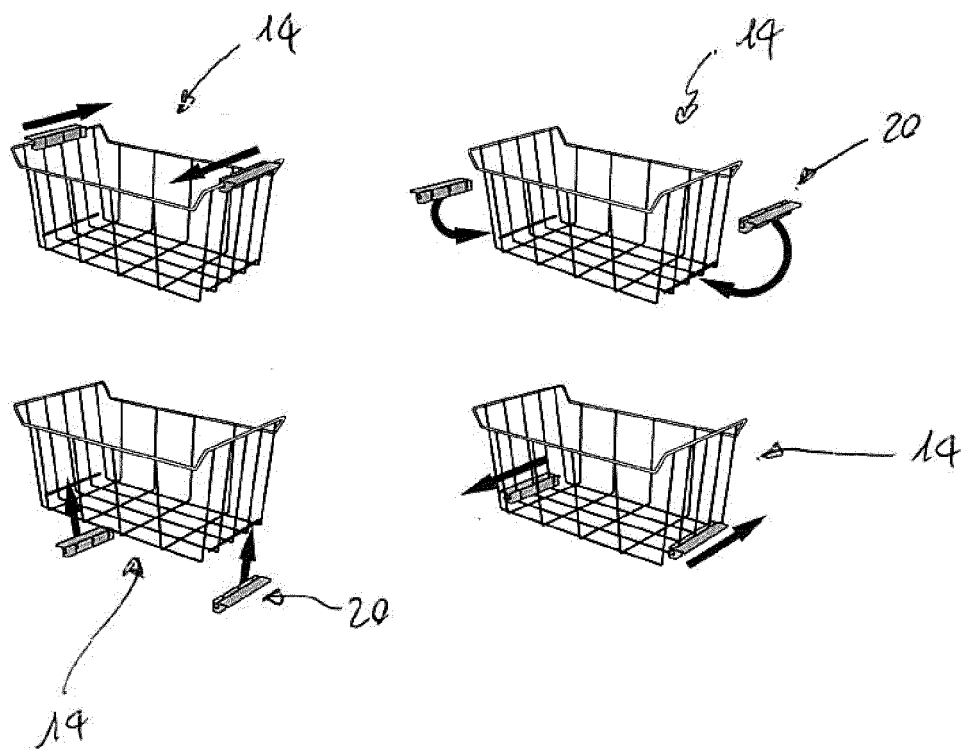


Fig. 8

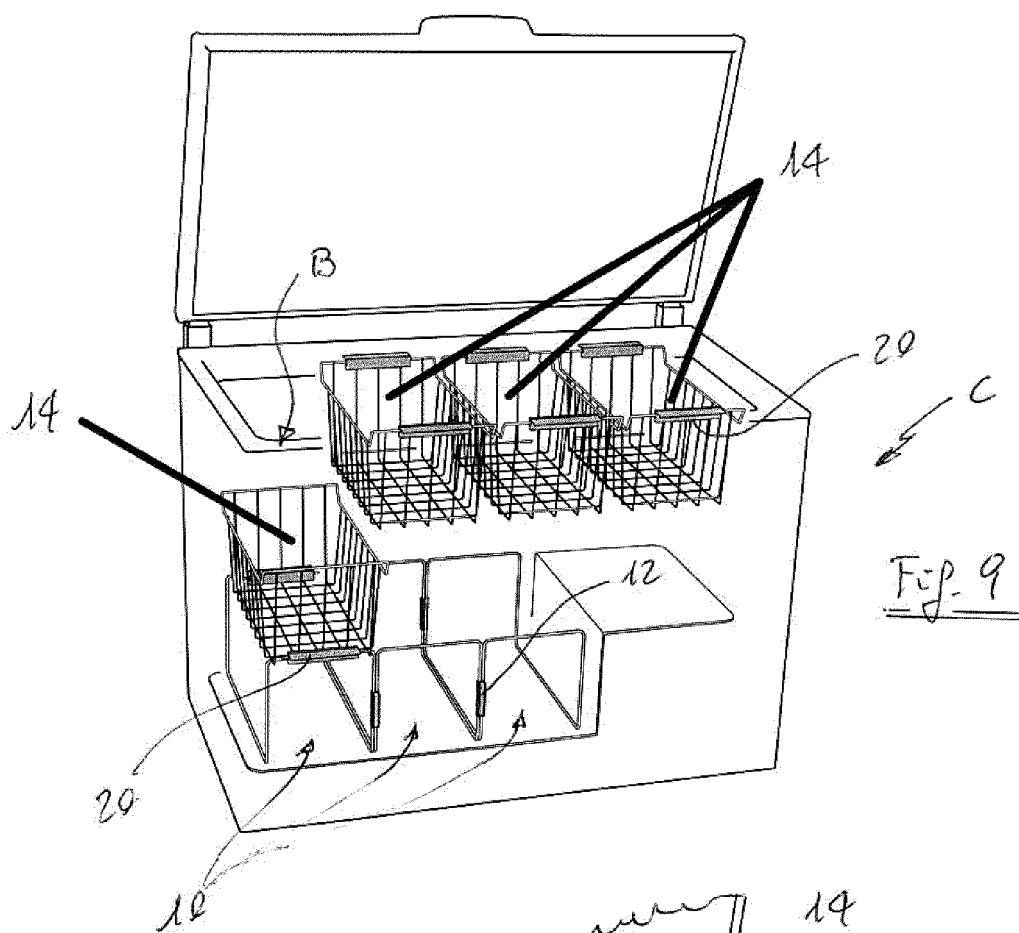


Fig. 9

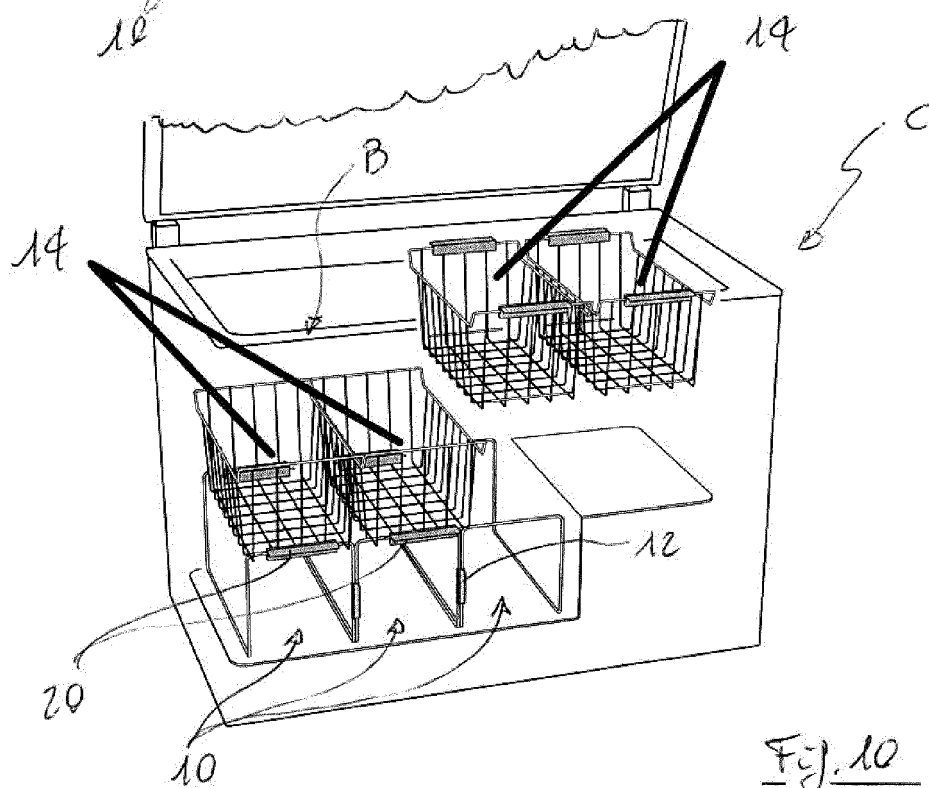


Fig. 10



EUROPEAN SEARCH REPORT

 Application Number
 EP 14 16 8878

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	US 2 155 284 A (CHRISTIAN STEENSTRUP) 18 April 1939 (1939-04-18)	1,2,4, 7-12	ADD. F25D23/02 F25D25/02
Y	* column 2, line 2; figure 1 * -----	3,5,6	
Y	JP H10 53249 A (SANYO ELECTRIC CO) 24 February 1998 (1998-02-24) * abstract; figure 11 * -----	3	
Y	US 6 691 382 B1 (SU LIEN-CHENG [TW]) 17 February 2004 (2004-02-17) * abstract; figures 3, 7 * -----	5,6	
A	WO 2007/029182 A2 (ARCELIK AS [TR]; GUNDUZ NIHAT [TR]; MUTLU SATI [TR]; TUNCEL TUNC [TR];) 15 March 2007 (2007-03-15) * abstract; figures 5, 11 * -----	8-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			F25D
Place of search		Date of completion of the search	Examiner
The Hague		8 September 2014	Melo Sousa, Filipe
CATEGORY OF CITED DOCUMENTS		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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 16 8878

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08-09-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2155284 A	18-04-1939	NONE	
JP H1053249 A	24-02-1998	NONE	
US 6691382 B1	17-02-2004	NONE	
WO 2007029182 A2	15-03-2007	EP 1922518 A2 WO 2007029182 A2	21-05-2008 15-03-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82