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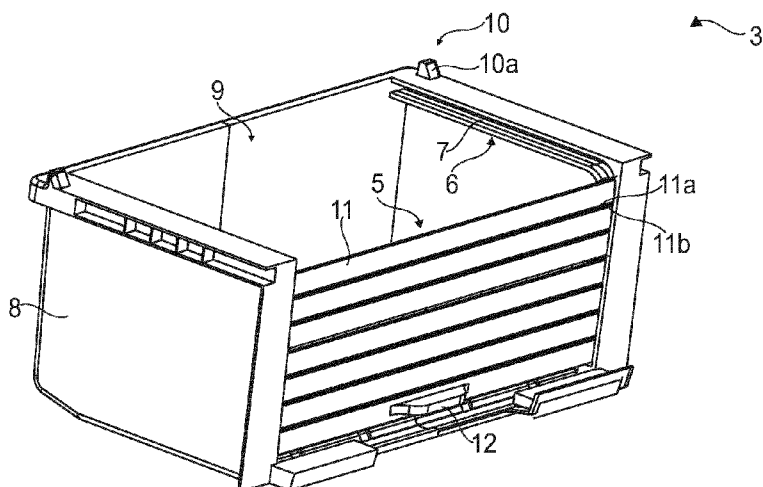
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(54) **Title:** REFRIGERATOR HAVING A VEGETABLE COMPARTMENT WITH IMPROVED USABILITY

Fig. 3



(57) **Abstract:** The present invention relates to a refrigerator (1) comprising a cabinet (2), one or more compartments (3) each for storing and refrigerating vegetables/fruits, wherein each compartment (3) is disposed into the cabinet (2). The refrigerator (1) of the present invention further comprises one or more front apertures (4) each formed into the front side of the respective compartment (3) so as to allow access to the user and flexible covers (5) each adapted to allow the user to selectively close or open the front side of the respective compartment (3) respectively, by way of sliding the flexible cover (5) onto the front side or off from the front side of the respective compartment.



Description**REFRIGERATOR HAVING A VEGETABLE COMPARTMENT WITH IMPROVED
USABILITY**

- [0001] The present invention relates to the vegetable compartments of a refrigerator.
- [0002] Refrigerators are commonly known in the art. Fig. 1 shows a refrigerator (1') which is known from the prior art. The refrigerator (1') comprises a cabinet (2') and one or more compartments (3') each for storing and refrigerating articles such as vegetables and fruits, wherein each compartment (3) is disposed into the cabinet (2). The compartments (3') are each provided as a box-like storage drawer which is releasably and extendably disposed into the cabinet (2'). The user stores various vegetables and various fruits by placing them side by side and one above the other into the box-like storage drawers. When the user desires to retrieve a frozen article, then he/she slides the box-like storage drawer horizontally out of the cabinet (2'), and accesses the frozen article through the top aperture of the box-like storage drawer.
- [0003] A problem with the prior art refrigerator is that there is a risk that the box-like storage drawer falls out of the cabinet (2') when the user pulls the same too much in order to store or retrieve the articles.
- [0004] WO2015000525 (A1) discloses a refrigerator.
- [0005] An objective of the present invention is to provide a refrigerator which has one or more compartments that overcome the aforementioned problems of the prior art in a cost effective way and which enables the user to easily and quickly access the interior of the compartment when storing or retrieving articles.
- [0006] This objective has been achieved by the refrigerator as defined in claim 1. Further achievements have been attained by the subject-matters respectively defined in the dependent claims.
- [0007] The refrigerator of the present invention comprises one or more front apertures which are formed into the front side of the respective compartment so as to allow access to the user; and one or more flexible covers which are each adapted to allow the user to selectively close or

open the front side of the respective compartment respectively by way of sliding the flexible cover onto the front side or off from the front side of the respective compartment and one or more guiding means which are each adapted to slidably guide the flexible cover onto the front side and off from the front side of the respective compartment.

- [0008] A major advantageous effect of the present invention is that the user can access the space inside each compartment more easily and quickly through the front side by virtue of the respective sliding flexible cover regardless whether the compartment is stationary or releasably extendable. For instance, the user can manipulate the flexible cover from the closed state to the open state when he/she needs to store or retrieve one or more articles through the front side of the compartment. Thereby, the usability of the compartment has been further improved, and the user satisfaction can be increased.
- [0009] In alternative embodiments, the flexible cover is guided in the closed state to the top side, the bottom side or one of the lateral sides of the compartment. These embodiments are particularly advantageous as the flexible cover can be smoothly moved off from the front side of the compartment, and prevented from obstructing the user when accessing the compartment through the front side.
- [0010] In another embodiment, the opposing sides of the respective flexible cover are slidably accommodated in respective grooves. This embodiment is particularly advantageous as the grooves can securely hold the flexible cover, and prevent from becoming loose.
- [0011] In an alternative embodiment, one or more compartments are stationary. In this embodiment, the stationary compartment is defined through the walls of the cabinet, wherein the guiding means are formed onto the walls of the cabinet. This embodiment is particularly advantageous as the space utilization efficiency can be increased, and the costs can be reduced.
- [0012] In another alternative embodiment, one or more compartments are each releasably extendable. In this embodiment, the guiding means are formed directly onto the body of the compartment. This embodiment is particularly advantageous as the user can release the compartment for cleaning. In

addition, the user can release and remount the compartment to another level inside the cabinet. Furthermore, the user can release and transport the compartment to another location.

- [0013] In another embodiment, the releasable and extendable compartment has a top aperture so as to allow access to the user when the front side is entirely closed by the respective flexible cover. This embodiment is particularly advantageous as the user can store or retrieve articles through the top aperture. In addition, the releasable and extendable compartment can be more easily cleaned through the top aperture.
- [0014] In another embodiment, the compartment is blocked through a respective stopping means against horizontally sliding out of the cabinet. This embodiment is particularly advantageous as the releasable and extendable compartment can be securely prevented from falling out of the cabinet.
- [0015] In another embodiment, a plurality of slats are side by side flexibly joined by means of respective hinges so as to form the flexible cover. These embodiments are particularly advantageous as the flexible cover can be rendered flexible without compromising its mechanical strength.
- [0016] In another embodiment, a grip is formed onto the flexible cover. In another embodiment, the grip is formed onto the leading slat. This embodiment is particularly advantageous as the grip facilitates manipulation of the flexible cover.
- [0017] Additional features and additional advantageous effects of the refrigerator of the present invention will become more apparent with the detailed description of the embodiments with reference to the accompanying drawings in which:
- [0018] Figure 1 - is a schematic perspective view of a refrigerator according to the prior art;
- [0019] Figure 2 - is a schematic perspective view of a compartment which has been released from the refrigerator according to an embodiment of the present invention, wherein the flexible cover of the compartment is open;
- [0020] Figure 3 - is another schematic perspective view of the compartment of Fig. 2, wherein the flexible cover of the compartment is closed;

- [0021] Figure 4 - is a schematic perspective view of the refrigerator according to an embodiment of the present invention, wherein the flexible cover of the compartment is open;
- [0022] Figure 5 - is a schematic perspective enlarged view of the detail A of Fig. 4;
- [0023] Figure 6 - is another schematic perspective view of the refrigerator of Fig.4, wherein the flexible cover of the compartment is partly closed;
- [0024] Figure 7 - is a schematic perspective enlarged view of the detail B of Fig. 6;
- [0025] Figure 8 - is another schematic perspective view of the refrigerator of Fig.4, wherein the flexible cover of the compartment is completely closed;
- [0026] Figure 9 - is a schematic perspective enlarged view of the detail C of Fig. 8;
- [0027] Figure 10 - is another schematic perspective view of the refrigerator of Fig.4, wherein the flexible cover of the compartment is completely closed;
- [0028] Figure 11 - is a schematic perspective enlarged view of the detail D of Fig. 10;
- [0029] Figure 12 - is another schematic perspective view of the refrigerator of Fig.4, wherein the compartment is partly extended out of the cabinet, and wherein the flexible cover of the compartment is completely closed;
- [0030] Figure 13 - is a schematic perspective enlarged view of the detail E of Fig. 12;
- [0031] Figure 14 - is another schematic perspective view of the refrigerator of Fig.4, wherein the compartment is partly extended out of the cabinet, and wherein the flexible cover of the compartment is open;
- [0032] Figure 15 - is a schematic perspective enlarged view of the detail F of Fig. 14.
- [0033] The reference signs appearing on the drawings relate to the following technical features.
1. Refrigerator
 2. Cabinet
 3. Compartment
 4. Front aperture

- 5. Flexible cover
- 6. Guiding means
- 7. Groove
- 8. Body
- 9. Top aperture
- 10. Stopping means

[0034] 10a. Projection

[0035] 10b. Indent

[0036] 11. Slat

[0037] 11a. Bearing

[0038] 11b. Shaft

[0039] 12. Grip

[0040] The refrigerator (1) comprises a cabinet (2), one or more compartments (3) each for storing and refrigerating vegetables and fruits, wherein each compartment (3) is disposed into the cabinet (2) (Fig. 4).

[0041] The refrigerator (1) of the present invention further comprises one or more front apertures (4) which are each formed into the front side of the respective compartment (3) so as to allow access to the user, one or more flexible covers (5) which are each adapted to allow the user to selectively close or open the front side of the respective compartment (3) respectively by way of sliding the flexible cover (5) onto the front side or off from the front side of the respective compartment (3); and one or more guiding means (6) which are each adapted to slidably guide the flexible cover (5) onto the front side and off from the front side of the respective compartment (3) (Fig. 2 and Fig. 3).

[0042] In an embodiment, one or more guiding means (6) are each further adapted to slidably guide the flexible cover (5) onto the front side of the respective compartment (3) and onto the top side of the respective compartment (3) (Fig. 2 and Fig. 3).

[0043] In another embodiment, one or more guiding means (6) each comprises a pair of grooves (7) which are adapted to respectively receive the opposing sides of the flexible cover (5) (Fig. 2 and Fig. 3).

[0044] In another embodiment, one or more compartments (3) are each

releasably and extendably disposed into the cabinet (2). In this embodiment, one or more guiding means (6) are each formed onto the body (8) of the respective compartment (3) (Fig. 13).

- [0045] In another embodiment, one or more top apertures (9) are formed into the top side of the respective compartment (3) so as to allow access to the user. In this embodiment, the top aperture (9) remains open when the front side is entirely closed by the respective flexible cover (5) (Fig. 13).
- [0046] In another embodiment, the refrigerator (1) comprises one or more stopping means (10) each for blocking the respective compartment (3) from sliding horizontally out of the cabinet (2) (Fig. 13).
- [0047] In another embodiment, the stopping means (10) comprises a projection (10a) which is formed onto the body (8) of the respective compartment (3). In this embodiment, the stopping means (10) also comprises an indent (10b) which restricts the forward movement of the projection (10a) (Fig. 13).
- [0048] In another embodiment, the flexible cover (4) comprises a plurality of slats (11) which are side by side flexibly joined (Fig. 2 and Fig. 3).
- [0049] In another embodiment, the slat (11) comprises one or more bearings (11a) and one or more shafts (11b) which are each received by the respective bearing (11a) (Fig. 2 and Fig. 3).
- [0050] In another embodiment, the flexible cover (4) comprises a grip (12) (Fig. 2 and Fig. 3).
- [0051] A major advantageous effect of the present invention is that the user can access the space inside each compartment (3) more easily and quickly through the front side by virtue of the respective flexible cover (5) regardless whether the compartment (3) is stationary or releasably extendable. For instance, the user can manipulate the flexible cover (5) from the closed state to the open state when he/she needs to store or retrieve one or more articles through the front side of the compartment (3). Thereby, the usability of the compartment (3) has been further improved, and the user satisfaction can be increased. Other advantageous effects of the present invention can be taken from the above-described embodiments.

Claims

1. A refrigerator (1) comprising a cabinet (2) and one or more compartments (3) each for storing and refrigerating vegetables and fruits, wherein each compartment (3) is disposed into the cabinet (2), **characterized in that**
 - one or more front apertures (4) which are each formed into the front side of the respective compartment (3) so as to allow access to the user,
 - one or more flexible covers (5) which are each adapted to allow the user to selectively close or open the front side of the respective compartment (3) respectively by way of sliding the flexible cover (5) onto the front side or off from the front side of the respective compartment (3) and
 - one or more guiding means (6) which are each adapted to slidably guide the flexible cover (5) onto the front side and off from the front side of the respective compartment (3).
2. The refrigerator (1) according to claim 1, **characterized in that** one or more guiding means (6) are each further adapted to slidably guide the flexible cover (5) onto the front side of the respective compartment (3) and onto the top side of the respective compartment (3).
3. The refrigerator (1) according to claim 1, **characterized in that** one or more guiding means (6) each comprises a pair of grooves (7) which are adapted to respectively receive the opposing sides of the respective flexible cover (5).
4. The refrigerator (1) according to any one of claims 1 to 3, **characterized in that** one or more compartments (3) are each releasably and extendably disposed into the cabinet (2), wherein one or more guiding means (6) are each formed onto the body (8) of the respective compartment (3).
5. The refrigerator (1) according to claim 4, **characterized in that** one or more top apertures (9) which are each formed into the top side of the respective compartment (3) so as to allow access to the user, wherein the top aperture (9) remains open when the front side is entirely closed by the respective flexible cover (5).
6. The refrigerator (1) according to claim 4 or 5, **characterized in that** one or more stopping means (10) each for blocking the respective compartment (3) from sliding horizontally out of the cabinet (2).
7. The refrigerator (1) according to claim 1, **characterized in that** the flexible cover

- (4) comprises a plurality of slats (11) which are side by side flexibly joined.
8. The refrigerator (1) according to claim 1, **characterized in that** the flexible cover (5) comprises a grip (12).

Fig. 1

PRIOR ART

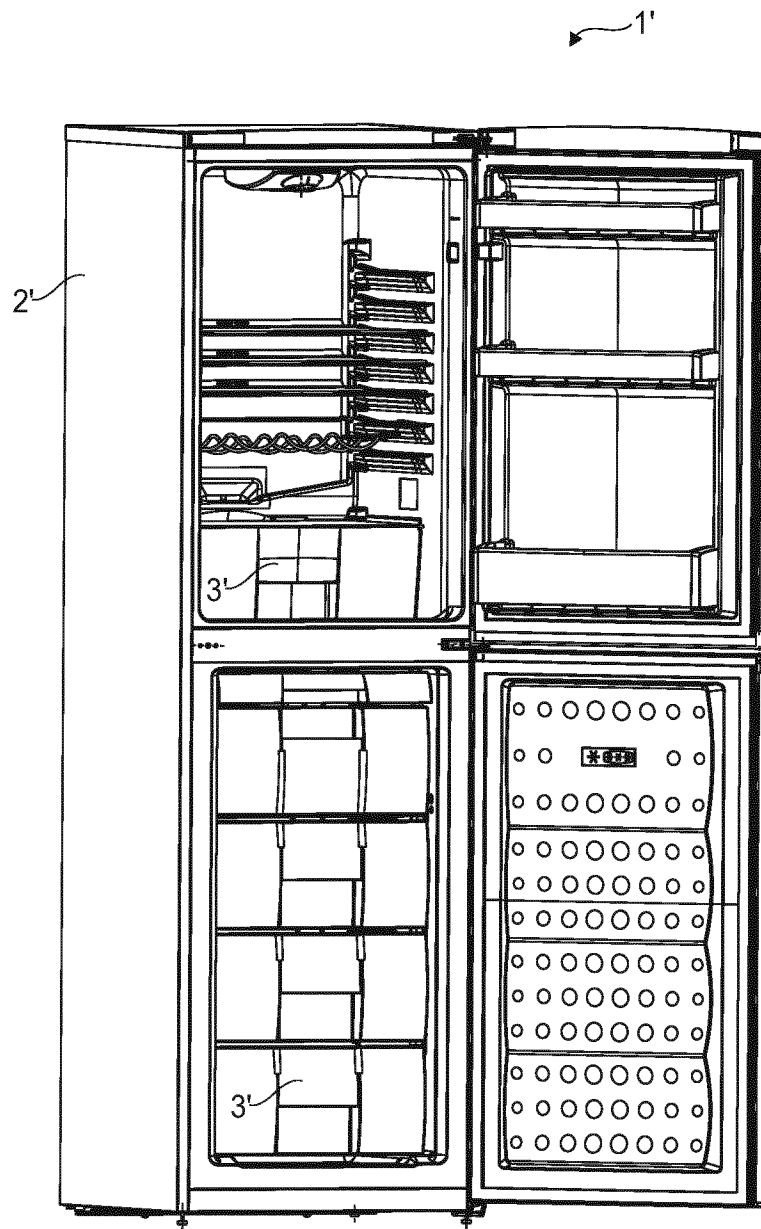


Fig. 2

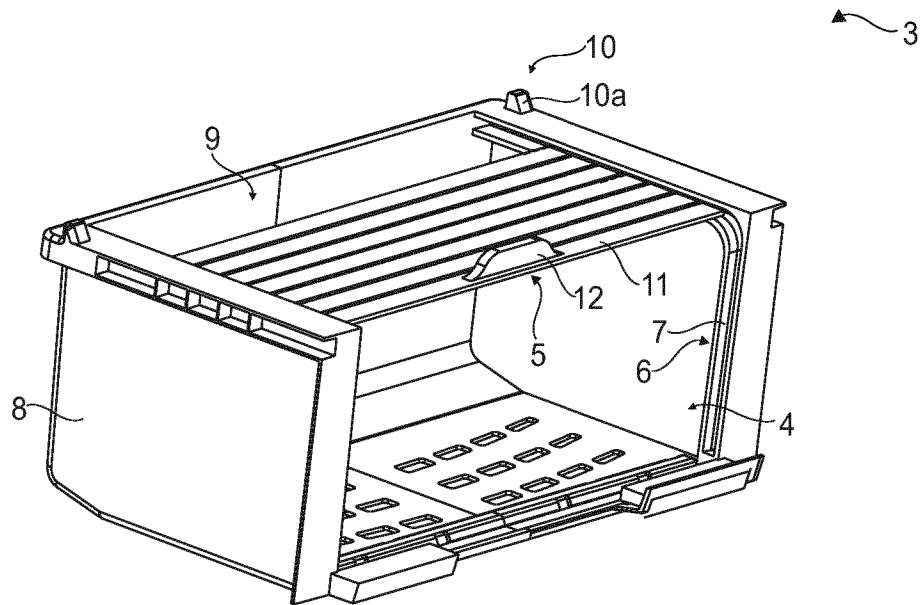


Fig. 3

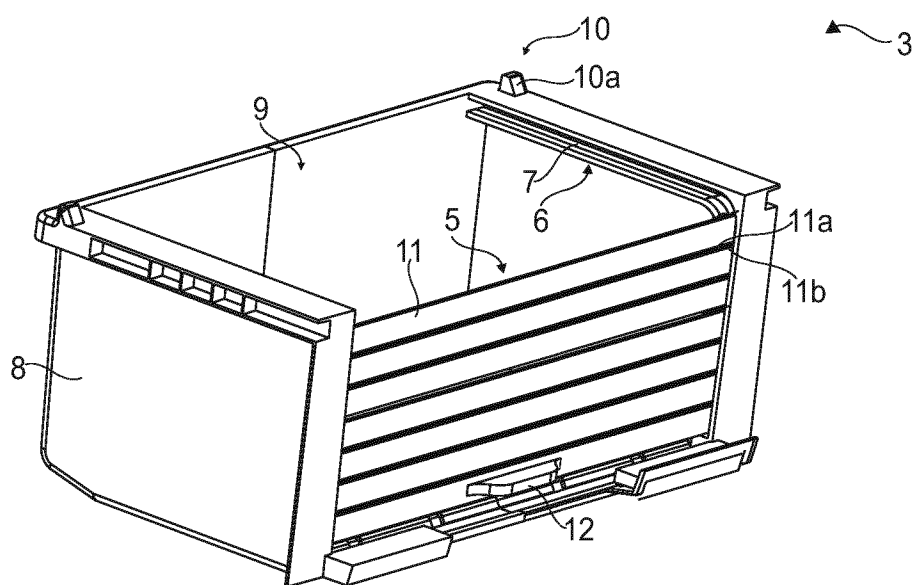


Fig. 4

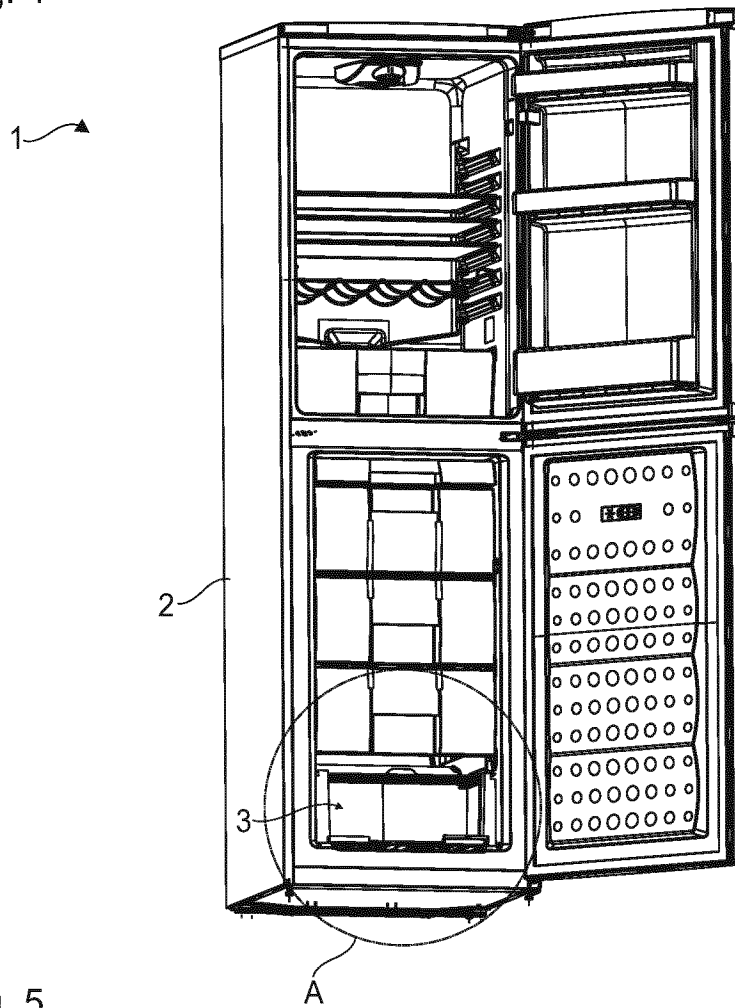


Fig. 5

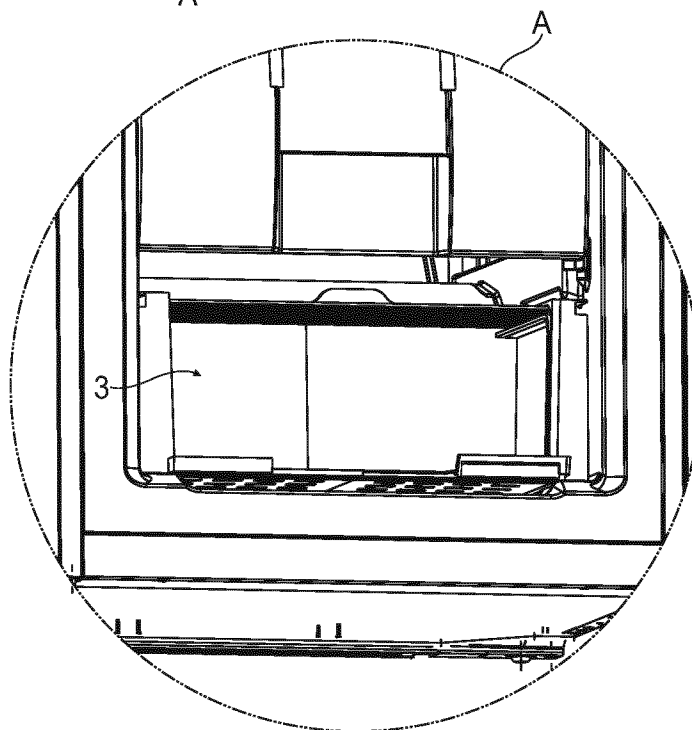


Fig. 6

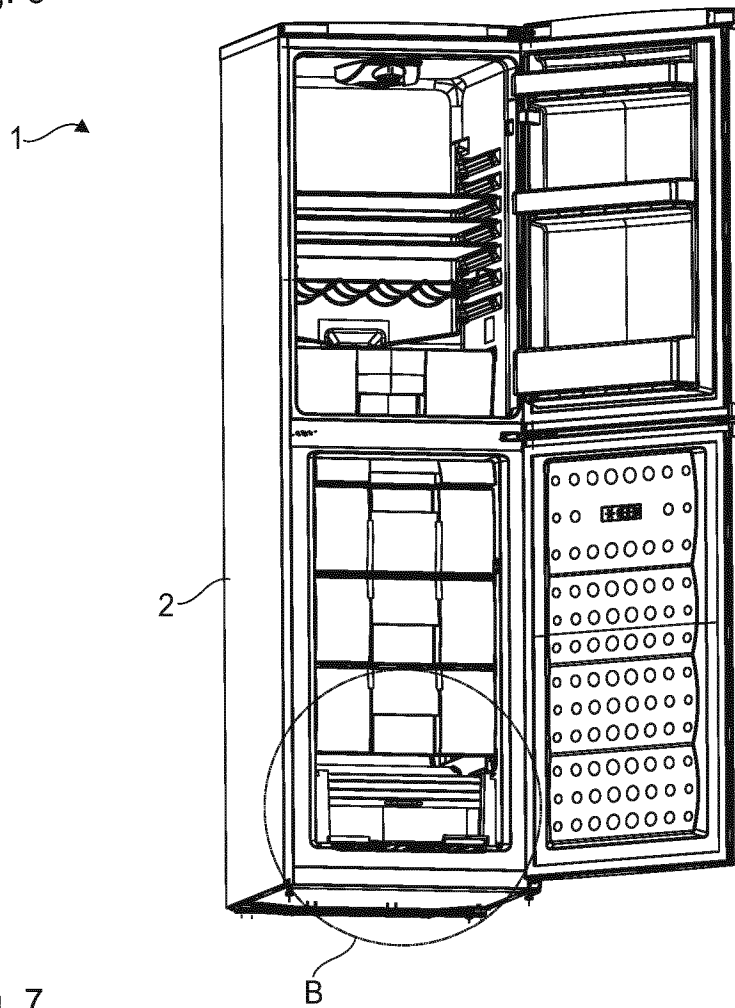


Fig. 7

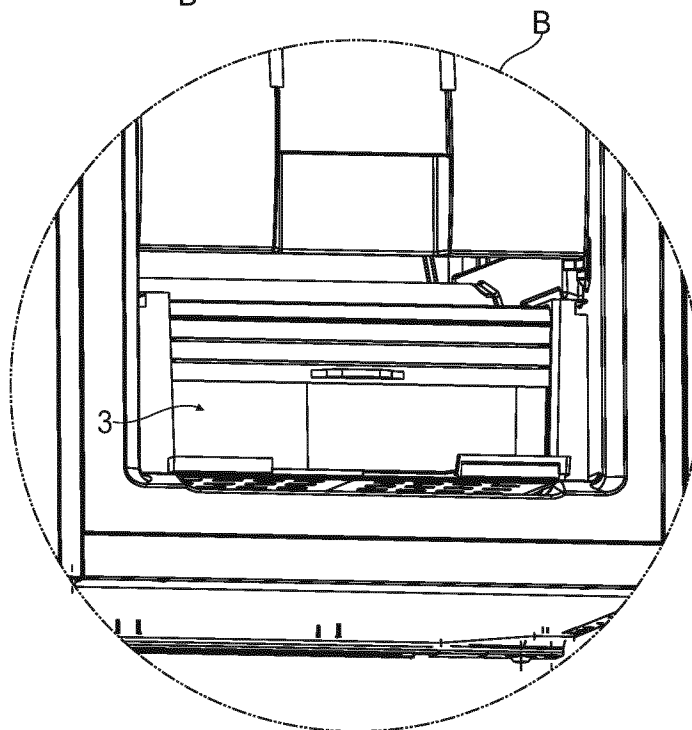


Fig. 8

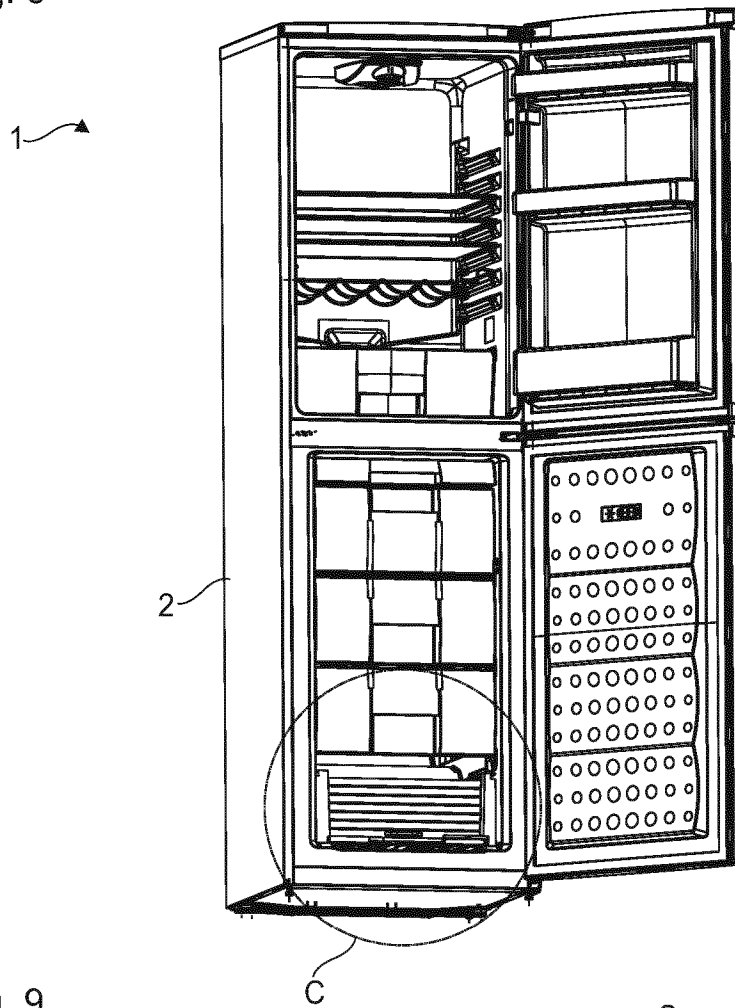


Fig. 9

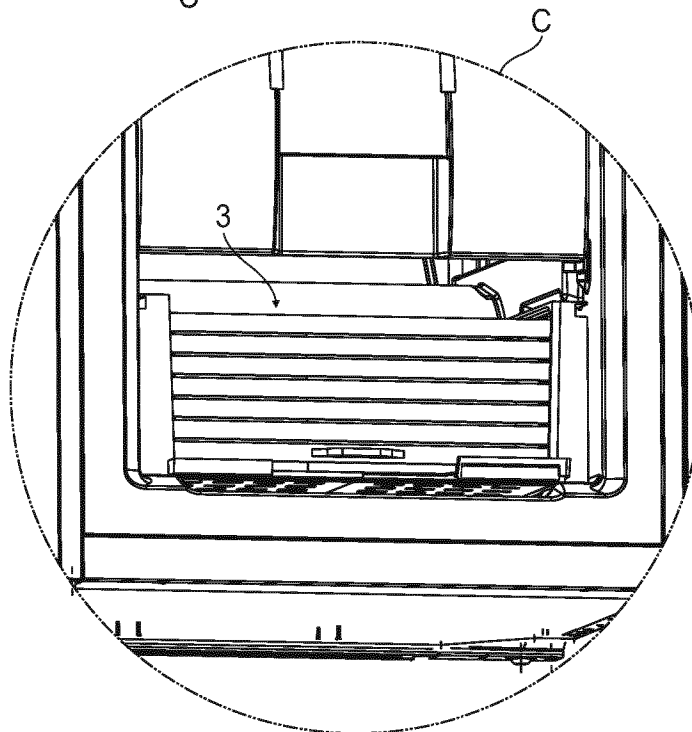


Fig. 10

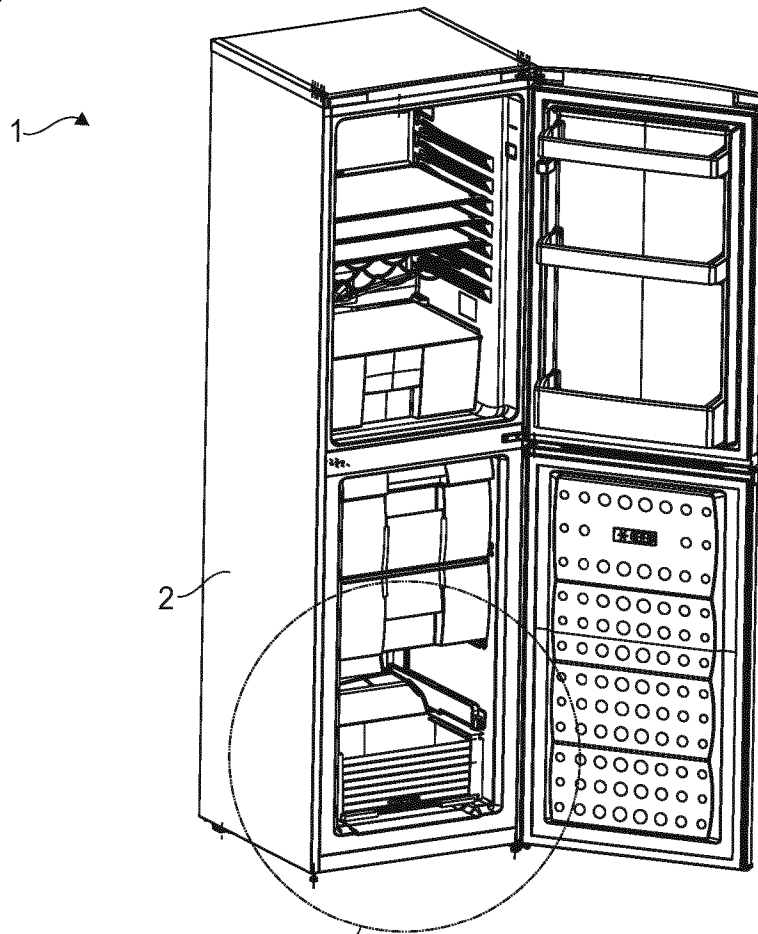


Fig. 11

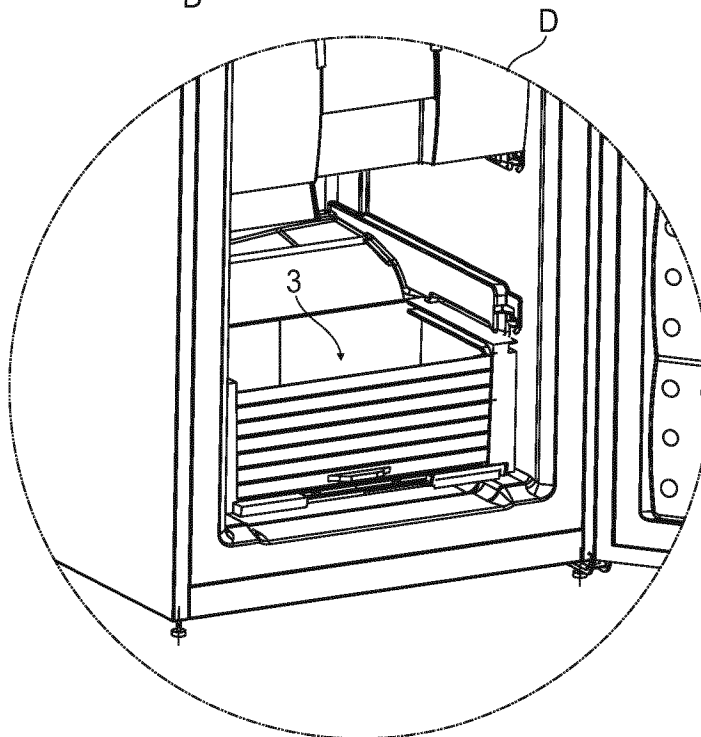


Fig. 12

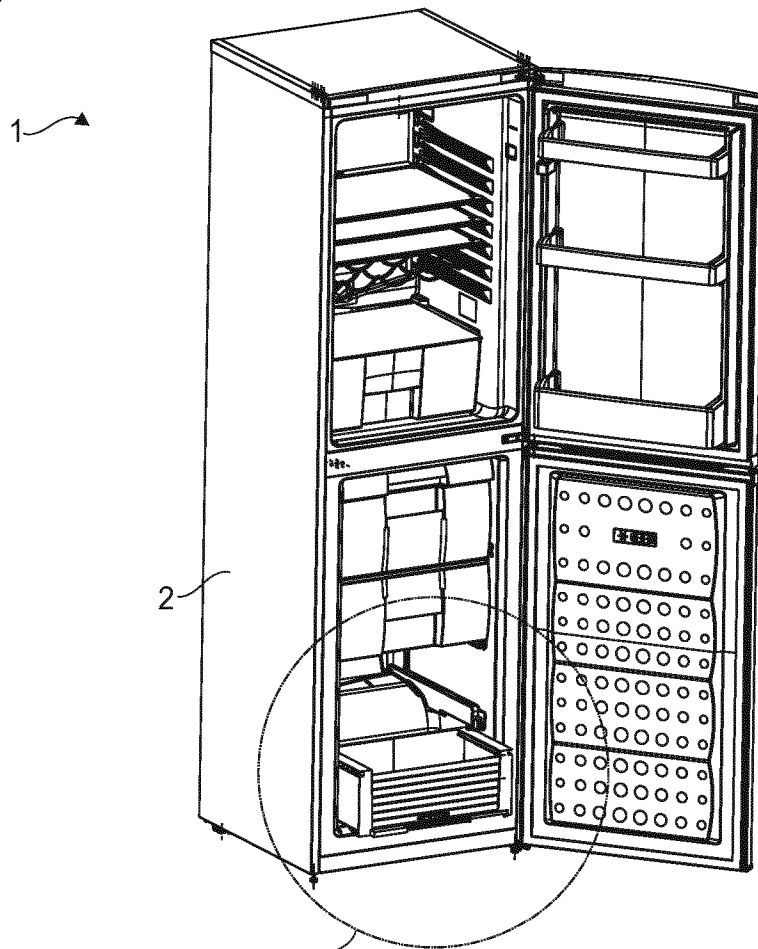


Fig. 13

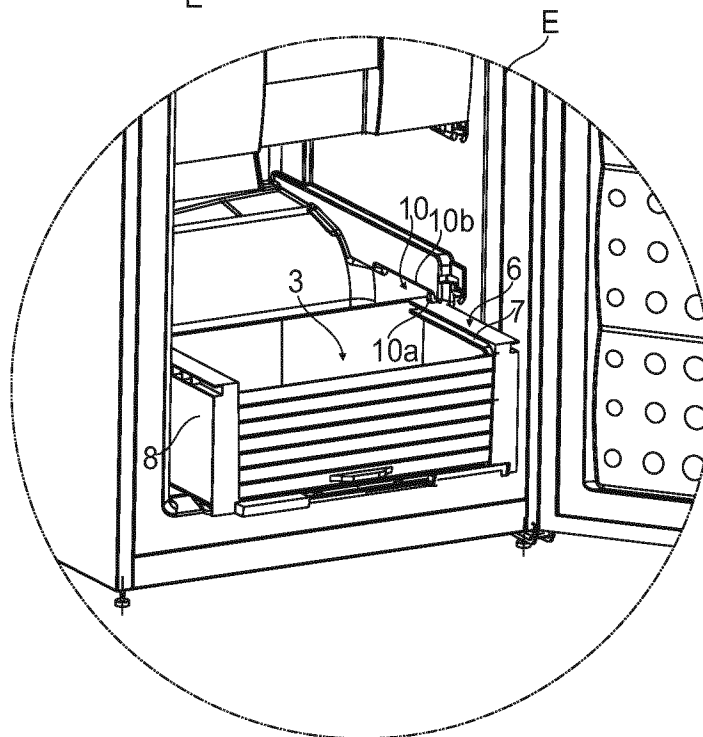


Fig. 14

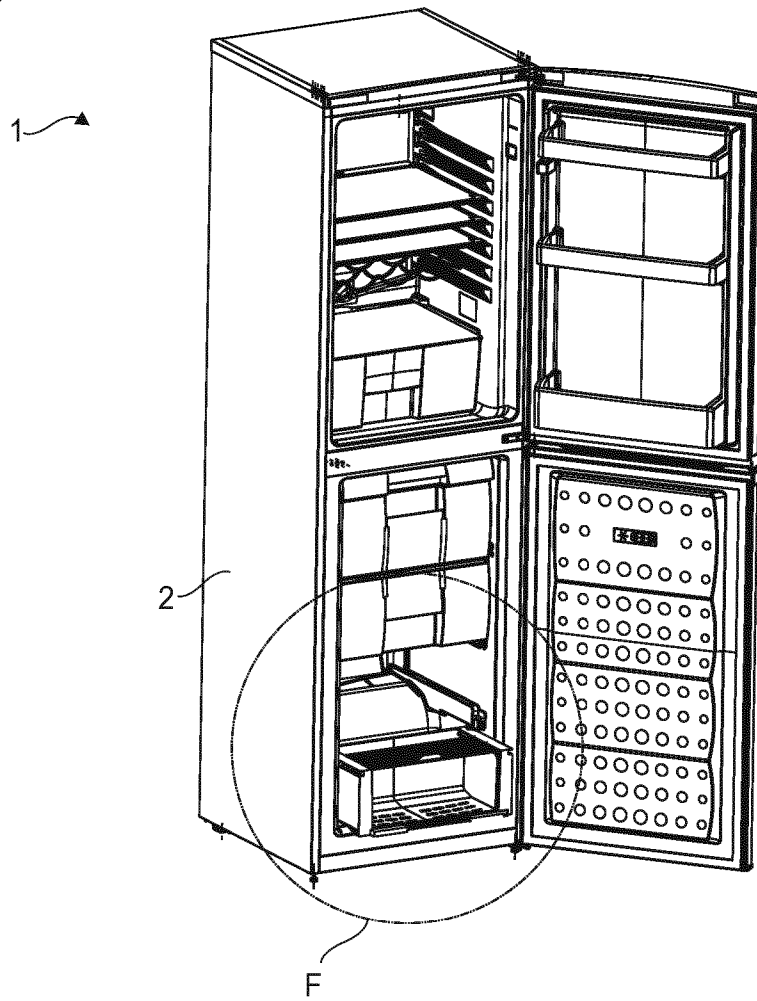
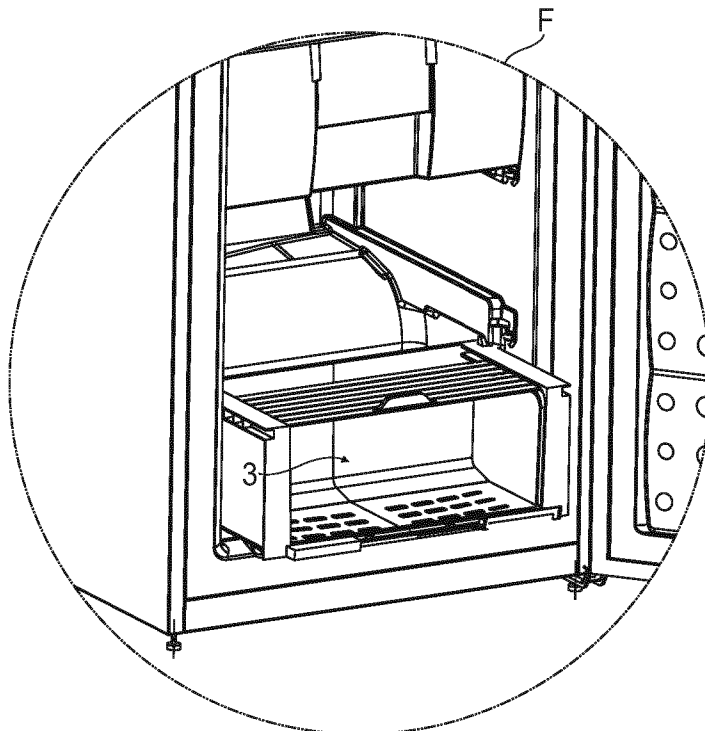


Fig. 15



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2015/078933

A. CLASSIFICATION OF SUBJECT MATTER
INV. F25D25/02
ADD. E06B9/15

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 E06B A47B B65D

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

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 204 313 575 U (HEFEI JINGHONG ELECTRICAL CO LTD) 6 May 2015 (2015-05-06)	1-5,8
Y	page 1; figures	6,7
X	----- KR 2013 0055173 A (LG ELECTRONICS INC [KR]) 28 May 2013 (2013-05-28) figures	1-5,8
X	----- CN 204 141 932 U (HEFEI ROYALSTAR SANYO ELECTRIC APPLIANCE CO LTD) 4 February 2015 (2015-02-04) abstract; figures	1-5,8
X	----- CN 104 949 448 A (HAIER GROUP CORP; QINGDAO HAIGAO DESIGN MANUFACTURE CO LTD) 30 September 2015 (2015-09-30) abstract; figures	1,2,8
	----- -/-	



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

11 August 2016

Date of mailing of the international search report

22/08/2016

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2015/078933

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 947 573 A (TOVAR VIRGILIO O [US] ET AL) 7 September 1999 (1999-09-07) column 3, line 5; figures 3-5 -----	6
Y	US 3 351 405 A (FERDINAND IRWIN J ET AL) 7 November 1967 (1967-11-07) column 3, line 43; figures 1,2 -----	7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2015/078933

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KR 20130055173	A	28-05-2013	NONE	

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CN 104949448	A	30-09-2015	NONE	

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