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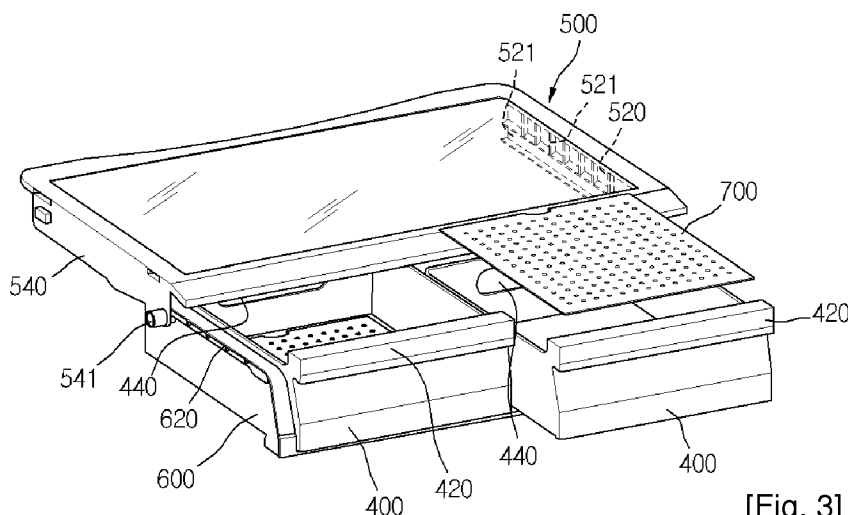
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[Fig. 3]

(57) Abstract: The present invention relates to an in-and-out structure of a food storage container provided in a refrigerator, wherein in case that a plurality of storage containers are provided in a layer, all of the storage containers are pulled out at a time or any one of the storage containers is pulled out according to the user's choice.

Abstract

The present invention relates to an in-and-out structure of a food storage container provided in a refrigerator, wherein in case that a plurality of storage containers are provided in a layer, all of the storage containers are pulled out at a time or any one of the storage containers is pulled out according to the user's choice.

Description

REFRIGERATOR

Technical Field

- [1] This document relates to a storage container withdrawing structure of a refrigerator.

Background Art

- [2] Generally, a refrigerator is an apparatus for storing various foodstuffs at a low temperature, and is divided into the refrigerator for freezing and the refrigerator for refrigerating depending on the state of the foodstuffs to be stored therein.
- [3] Cold air, which is to be supplied into the refrigerator, is generated by heat-exchanging a refrigerant with air, and is consistently supplied into the refrigerator by repeating a cycle consisting of compression, condensation, expansion and evaporation.
- [4] And, the supplied cold air is uniformly transferred into the refrigerator, so that the foodstuffs stored in the refrigerator may be stored at a desired temperature.
- [5] Figure 1 shows an in-and-out structure of a shelf provided in the conventional refrigerator in a partial perspective view.
- [6] Referring to Fig. 1, the conventional refrigerator includes a body 1 in which a freezing chamber 10 and a refrigerating chamber 20 are provided, a door 22 opening/closing the freezing chamber 10 or the refrigerating chamber 20, and a plurality of storage containers 40 and shelves 50 provided in the freezing chamber 10 and/or the refrigerating chamber 20.
- [7] Specifically, a storage space is formed, as an inner space of the freezing chamber 10 and the refrigerating chamber 20 is partitioned by the plurality of storage containers 40 and shelves 50.
- [8] Also, the storage container is formed to have the shape of an approximate rectangular box, wherein an upper surface thereof is opened. And, a guide rail 60, which allows the storage container 40 to be slidably moved in and out of the body 1, is further formed on an inner surface of the body 1. Of course, a structure engaged to the guide rail 60 may be provided on an outer circumferential surface of the storage container 40.
- [9] However, the conventional refrigerator has problems as follows:
- [10] The storage container 40 of the refrigerator according to the prior art is moved, for the entrance and exit, in the front and rear directions, as the guide rail 60 formed on the inner surface of the body 1 is directly connected with the structure formed on the outside of the storage container 40. Accordingly, the width of the storage container 40 must correspond to the width of the inner space of the freezing chamber 10 or refrigerating chamber 20. Therefore, there is a disadvantage in that different kinds of foodstuffs cannot be separately stored in different storage containers 40. In other

words, as various kinds of foodstuffs are received in one storage container 40, there are inconveniences that the foodstuffs cannot be classified by the type of the foodstuffs and that all of the stored foodstuffs have to be taken out in order to seek for specific foodstuff.

- [11] In addition, where a plurality of storage containers are provided in one layer, each of the whole drawers has to be opened in order to seek for specific foodstuff.

Disclosure of Invention

Technical Problem

- [12] The present invention is proposed to resolve these inconveniences, and therefore, an object of the present invention is to provide a storage container withdrawing structure of a refrigerator, wherein a plurality of storage containers are provided in one layer, and some or all of the plurality of storage containers are withdrawn at a time.

Technical Solution

- [13] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a refrigerator includes a body in which a refrigerating chamber and a freezing chamber are provided; at least one shelf which horizontally divides the refrigerating chamber or the freezing chamber; a housing movably provided at a lower side of the shelf; a plurality of storage containers movably received in the housing; and an interference means provided in the housing and the storage containers to pull out any one of the plurality of storage containers or all of the plurality of storage containers at a time.

- [14] According to another embodiment of the present invention, there is provided a refrigerator, including: a body in which a food storage space is provided; a shelf, of which both ends are connected to a side wall of the storage space; a housing movably connected to the shelf or the side wall of the storage space; and a plurality of storage containers, of which a side portion, a bottom portion and a rear portion are supported by the housing and an upper opening is covered by the shelf.

Advantageous Effects

- [15] According to the storage container withdrawing structure of the refrigerator of the present invention, the foodstuffs may be easily received and taken out because the user may withdraw all of the plurality of storage containers by pulling one storage container.
- [16] And, the convenience in using the storage container is improved, since the user may withdraw all of the plurality of storage containers at a time or may respectively withdraw each of the plurality of storage containers.
- [17] Furthermore, there is an advantage in that the user, who purchased the product, feels satisfaction with the product as the convenience of the storage container for storing

foodstuffs is increased. Accordingly, the overall reliability of the product is improved and the corporate image is increased.

Brief Description of the Drawings

- [18] Fig. 1 is a partial perspective view showing an in-and-out structure of a shelf provided in the conventional refrigerator.
- [19] Fig. 2 is a perspective view showing an inner structure of a refrigerator having a storage container withdrawing structure according to a preferred embodiment of the present invention.
- [20] Fig. 3 is a perspective view showing a storage container withdrawing structure of a refrigerator according to a preferred embodiment of the present invention.
- [21] Fig. 4 is a side cross-sectional view of the storage container.
- [22] Fig. 5 is a partial perspective view showing a state that any one of a plurality of storage containers is withdrawn.
- [23] Fig. 6 is a side cross-sectional view of a storage container and a housing showing the withdrawing process in Fig. 5.
- [24] Fig. 7 is a perspective view showing a state that all of the plurality of storage containers are withdrawn.
- [25] Fig. 8 is a side cross-sectional view of a storage container and a housing showing the withdrawing process in Fig. 5.
- [26] Fig. 9 is an exploded perspective view showing a storage container withdrawing structure of a refrigerator according to another embodiment of the present invention.

Mode for the Invention

- [27] Hereinafter, a storage container withdrawing structure of a refrigerator according to the present invention will be explained in detail with reference to the accompanying drawings.
- [28] Figure 2 shows an inner structure of a refrigerator having a storage container withdrawing structure according to a preferred embodiment of the present invention in a perspective view.
- [29] Referring to Fig. 2, the refrigerator 100 according to the embodiment of the present invention is laterally divided by a barrier 120, so that a freezing chamber 300 for storing foodstuffs in a frozen state is disposed at the left side and a refrigerating chamber 200 for storing foodstuffs in a fresh state is disposed at the right side thereof.
- [30] Further, an inner space of the freezing chamber 300 and the refrigerating chamber 200 is selectively closed by a freezing chamber door 320 and a refrigerating chamber door 220, respectively. And, the freezing chamber door 320 and the refrigerating chamber door 220 are pivotably installed at the left side and right side of a body of the refrigerator 100 by hingedly coupling them thereto.

- [31] Also, the convenience for the user is improved by providing a home-bar 240 at the refrigerating chamber door 220 and by providing a dispenser 340 at the freezing chamber door 320. That is, the user may take out foodstuffs such as a bottle of soda water via the home-bar 240 without opening the refrigerating chamber door 220. And, the user may dispense ice cubes or water via the dispenser 340 without opening the freezing chamber door 320.
- [32] In addition, a plurality of door baskets 360 are provided at the rear surface of the refrigerating chamber door 220 and the freezing chamber door 320 so that various foodstuffs may be classified and stored therein.
- [33] Meanwhile, the freezing chamber 300 and the refrigerating chamber 200 are divided into a plurality of layers by a plurality of shelves 140, and a plurality of storage containers 400 for storing the foodstuffs are provided in the layers.
- [34] The storage containers 400 are divided into a vegetable box for storing vegetables and a drawer forming an all-purpose storage space, the vegetable box and the drawer are slidably installed inside the freezing chamber 300 and the refrigerating chamber 200 in a forward direction.
- [35] Hereinafter, the sliding structure of the above storage container 400 will be explained in detail with reference to the accompanying drawings.
- [36] Figure 3 shows a storage container withdrawing structure of a refrigerator according to a preferred embodiment of the present invention in a perspective view, and Figure 4 shows the storage container in a side cross-sectional view.
- [37] Referring to Figs. 3 and 4, the storage container 400 according to the embodiment of the present invention is the vegetable box provided in the refrigerating chamber 200 to store vegetables, wherein it is provided at the lower side of a shelf 500.
- [38] First of all, the shelf 500 will be explained.
- [39] The shelf 500 laterally divides the inner space of the refrigerator 200, of which foodstuffs or receptacles are seated on the upper surface, and the lower side thereof closes the upper surface of the storage container 400. That is, it is to minimize water evaporation of the foodstuffs received in the storage container 400, and is fitted into the inner wall of the refrigerating chamber 200.
- [40] Specifically, a shelf mounting member 540 is downwardly extended and formed at both sides of the shelf 500. And, at least one mounting projection 541, which is fitted into the inner wall of the refrigerating chamber 200, is formed at the outer circumferential surface of the shelf mounting member 540.
- [41] Also, a storage container guide 520 for guiding the sliding of the storage container 400 is formed at an inner circumferential surface of the shelf mounting member 540. Specifically, a rail receiving portion 521, in which a sliding rail 620 formed in the storage container 400 is fitted, is formed in the storage container guide 520. And, a

plurality of reinforcement ribs 522 for reinforcing the shelf mounting member 540 is formed at the upper side of the rail receiving portion 521. And, the inner part of the shelf 500, except edge portions, is made of a transparent material to check the foodstuffs received in the storage container 400.

[42] Meanwhile, a housing 600 for accommodating the storage container 400 is slidably connected to the shelf mounting member 540.

[43] Specifically, the housing 600 is configured to surround the bottom surface, both sides and some of the rear surface of the storage container 400. And, the upper surface and the front surface of the housing 600 is fully opened, so that the storage container 400 may be freely withdrawn therefrom. And, the sliding rail 620 is extended to a predetermined width at the upper edge of the both sides of the housing 600, and is inserted into the rail receiving portion 521. Specifically, the sliding rail 620 is formed from the rear end to the front end of the housing 600, as it is horizontally extended parallel to the edge portion of the housing 600.

[44] Here, the housing 600 is slid at the inner part of the shelf 500, however the present invention is not limited thereto, for example a separate groove in which the sliding rail 620 is received may also be formed in the side wall of the refrigerating chamber 200. In other words, the shelf 500 may not be exactly required for the connection of the housing 600. Specifically, it is noted that the shelf 500 may be fixed at the side surface of the refrigerating chamber 200 or movably inserted therein as it is formed as a plane plate, and that the housing 600, apart from the shelf 500, may be movably installed at the side wall of the refrigerating chamber 200. For this end, a groove or a rail receiving structure, in which the sliding rail 620 is received, must be provided in the side wall of the refrigerating chamber 200.

[45] Meanwhile, a latch projection 640, which is upwardly protruded and formed, is formed on the bottom of the housing 600. And the latch projection 640 is extended from the left end to the right end of the housing 600. And, the latch projection 640 is selectively inserted into a latch groove 460 (will be described) formed in the bottom of the storage container 400 according to the type of taking out the storage container 400. The latch projection 640 and the latch groove 460 correspond to an interference means for respectively or simultaneously taking out the plurality of storage containers 400. And, the rear surface of the latch projection 640 is vertically formed, and the front surface thereof is obliquely formed at a predetermined angle. And, a slanted surface is slanted from the front to the rear.

[46] Specifically, the plurality of storage containers 400 are forwardly pulled out together with the housing 600 at a time when the interference means are fastened to each other. On the contrary, the desired storage container 400 between the plurality of storage containers 400 is respectively pulled out when the interference means are not fastened.

The operational method thereof will be explained in detail with reference to the following drawings.

- [47] Also, one or more storage container 400 may be accommodated according to the size and requirement thereof, hereinafter two storage containers 400 which are received in the housing 600 will be explained.
- [48] Specifically, the storage containers 400 are formed to have the shape of an approximate rectangular box, wherein an upper surface thereof is opened, and a knob 420 which is forwardly protruded is provided on the front surface so that it can be easily grabbed by the user.
- [49] The knob 420 is formed to be further protruded from the side surface of the storage container 400 in an upward direction, so that the front end of the shelf 500 and the rear surface of the knob 420 is contacted to each other. Therefore, in case that the storage container 400 is fully inserted in the lower side of the shelf 500, the upper surface of the storage container 400 is tightly contacted to the front end of the shelf 500 and is closed.
- [50] An cold air introduction hole 440 is formed in the rear surface of the storage container 400 so that the cold air supplied into the refrigerating chamber 200 is freely introduced into the storage container 400. And, a crisper 700 is further provided on the bottom surface of the storage container 400 to reduce water evaporation. And, a plurality of minute holes are perforated into the crisper 700, and water film is formed by the moisture introduced into the holes, thereby minimizing water evaporation.
- [51] Also, the rear surface of the housing 600 is extended below the cold air introduction hole 440 of the storage container 400 so that the cold air introduction hole 440 is not blocked by the rear surface of the housing 600. That is, this allows the cold air in the refrigerating chamber to be freely introduced into the storage container 400 via the cold air introduction hole 440. Alternately, a cold air hole communicating with the cold air introduction hole 440 may be formed in the rear surface of the housing 600 while the rear surface of the housing 600 completely surrounds the rear surface of the storage container 400.
- [52] In addition, as described in the above, the latch groove 460 which allows the latch projection 640 formed on the bottom surface of the housing 600 to be selectively inserted therein is formed in the lower surface of the storage container 400.
- [53] Hereinafter, in-and-out structure of the storage container according to the present invention will be explained with reference to the accompanying drawings.
- [54] Figure 5 shows a state that only one of a plurality of storage containers is withdrawn in a partial perspective view, and Figure 6 is a side cross-sectional view of a storage container and a housing showing the withdrawing process in Fig. 5.
- [55] Referring to Figs. 5 and 6, in order to respectively pull out the storage container 400,

the user must operate it as follows.

- [56] Specifically, the user lifts the storage container 400 and pulls it toward the front while grabbing the knob 420 of the storage container 400. And then, the latch projection 640 is separated from the latch groove 460, and therefore the storage container 400 grabbed by the user is only pulled toward the front.
- [57] Also, after the user respectively pulls out the specific storage container 400 by means of this operation, the storage container 400 will be pushed toward the rear if the received foodstuffs are taken out or the foodstuffs to be stored are received therein.
- [58] Here, if the storage container 400 is pushed in a backward direction, the latch projection 640 is inserted into the latch groove 460. And, even if the latch groove 460 is stopped at a location spaced from the latch projection 640 while the user presses the storage container 400, the latch projection 640 is accurately inserted into the latch groove 460. Because the front surface of the latch projection 640 is obliquely formed, the lower surface of the storage container 400 is fastened to the latch projection 640 and is slightly raised along the latch projection 640 while it is backwardly moved. In this state, the user recognizes that the latch projection 640 is fastened to the latch groove 460, the storage container 400 is descended along the slanted surface of the latch projection 640 if the user release the storage container 400. And, the latch projection 640 is received in the latch groove 460, thereby completing the backward entry of the storage container 400.
- [59] Figure 7 shows a state that all of the plurality of storage containers are withdrawn in a perspective view, and Figure 8 is a side cross-sectional view of a storage container and a housing showing the withdrawing process in Fig. 5.
- [60] Referring to Figs. 7 and 8, in the storage container in-and-out structure of the refrigerator according to the embodiment of the present invention, the plurality of storage containers 400 can be pulled out together with the housing 600 at a time.
- [61] Specifically, in order to withdraw two storage containers 400 in a forward direction, the user horizontally pulls one of the two storage containers 400 while grabbing the knob 420 of the storage container 400. And then, the storage containers 400 are pulled out in a state that the latch projection 640 is fastened to the latch groove 460. And then, since the housing 600 is pulled out together with the storage containers 400, all of the plurality of storage containers 400 received in the housing 600 are pulled out at a time. Therefore, it is possible to pull out two storage containers 400 in a forward direction in a state that the knob formed in one of the two storage containers 400 is grabbed.
- [62] Figure 9 shows a storage container withdrawing structure of a refrigerator according to another embodiment of the present invention in an exploded perspective view.
- [63] Referring to Fig. 9, the interference means for pulling out the storage container according to the present embodiment includes a guide groove 660 formed in both sides

of the housing 600 in the shape of a letter "L," and a projection 480 protruded from the side of the storage container 400.

[64] Specifically, the guide groove 660 is configured to connect a vertical part with a horizontal part, and the projection 480 is disposed at the lower end of the vertical part of the guide groove 660 in a state that the storage container 400 is fully closed. And, the projection 480 is formed on the right side surface of the storage container 400 disposed at the right side and on the left side surface of the storage container 400 disposed at the left side between two storage containers 400.

[65] More particularly, in order to pull out any one of the plurality of storage containers 400, the user grabs the desired storage container 400 and pulls out the storage container 400 in a horizontal direction. And then, the projection 480 is forwardly moved along the horizontal part of the guide groove 660, and only the selected storage container 400 is forwardly moved out.

[66] In addition, in order to pull out the plurality of storage containers 400 at a time, the user grabs any one of the plurality of storage containers 400 and upwardly lifts them, and pulls them in a forward direction. And then, the projection 480 is inserted into the vertical part of the guide groove 660 and is pulled out together with the housing 600. That is, if the housing 600 is pulled out, all of the plurality of storage containers 400 are pulled out.

[67] the operation process of the present embodiment is contrary to that of the above described embodiment. In other words, in order to withdraw all of the plurality of storage containers 400 at a time, according to the above described embodiment, any one of the storage containers 400 has to be horizontally pulled, however according to the present embodiment, any one of the storage containers 400 has to be raised and horizontally pulled.

[68] On the contrary, in order to withdraw only one storage container 400, according to the above described embodiment, the selected storage container 400 is raised and horizontally pulled, however according to the present embodiment, the selected storage container 400 is just horizontally pulled.

[69] The scope of the present invention is not restricted to the above embodiments, but on the contrary it will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the inventions.

[70] For example, instead of the latch groove 460 and the latch projection 640 which are used as an interference means, projections corresponding to each other may be formed on the housing 600 and the storage container 400 so that they can be selectively interfered with each other when the storage container 400 is moved in/out.

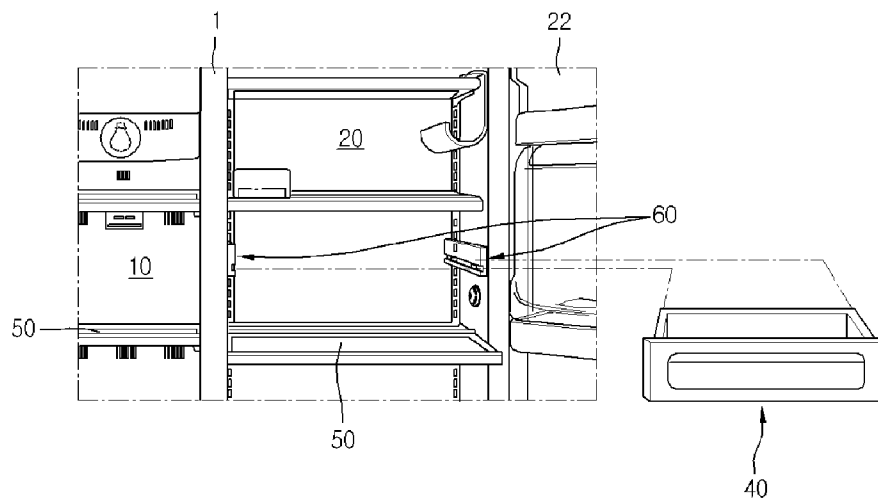
Claims

- [1] A refrigerator, comprising:
a body in which a refrigerating chamber and a freezing chamber are provided;
at least one shelf which horizontally divides the refrigerating chamber or the freezing chamber;
a housing movably provided at a lower side of the shelf;
a plurality of storage containers movably received in the housing; and
an interference means provided in the housing and the storage containers to pull out any one of the plurality of storage containers or all of the plurality of storage containers at a time.
- [2] The refrigerator according to claim 1, wherein the interference means includes a latch projection protruded at any one of bottom surfaces of the housing and the storage containers, and
a latch groove formed at the other of bottom surfaces of the housing and the storage containers, in which the latch projection is received.
- [3] The refrigerator according to claim 2, wherein only a selected storage container is pulled out by lifting and pulling any one of the plurality of storage containers.
- [4] The refrigerator according to claim 2, wherein the housing and the storage container are pulled out together by horizontally pulling any one of the plurality of storage containers.
- [5] The refrigerator according to claim 1, wherein the interference means includes a guide groove which is bent and respectively formed in both walls of the housing, and
a projection which is protruded from a side wall of each storage container and is inserted into the guide groove.
- [6] The refrigerator according to claim 5, wherein only a selected storage container is pulled out by horizontally pulling any one of the plurality of storage containers.
- [7] The refrigerator according to claim 5, wherein the housing and the storage container are pulled out together by lifting and pulling any one of the plurality of storage containers.
- [8] The refrigerator according to claim 1, wherein the shelf is fixedly connected to the body.
- [9] The refrigerator according to claim 1, wherein the shelf is configured to be moved independently from the housing and the storage container in a back-and-forth direction.
- [10] A refrigerator, comprising:

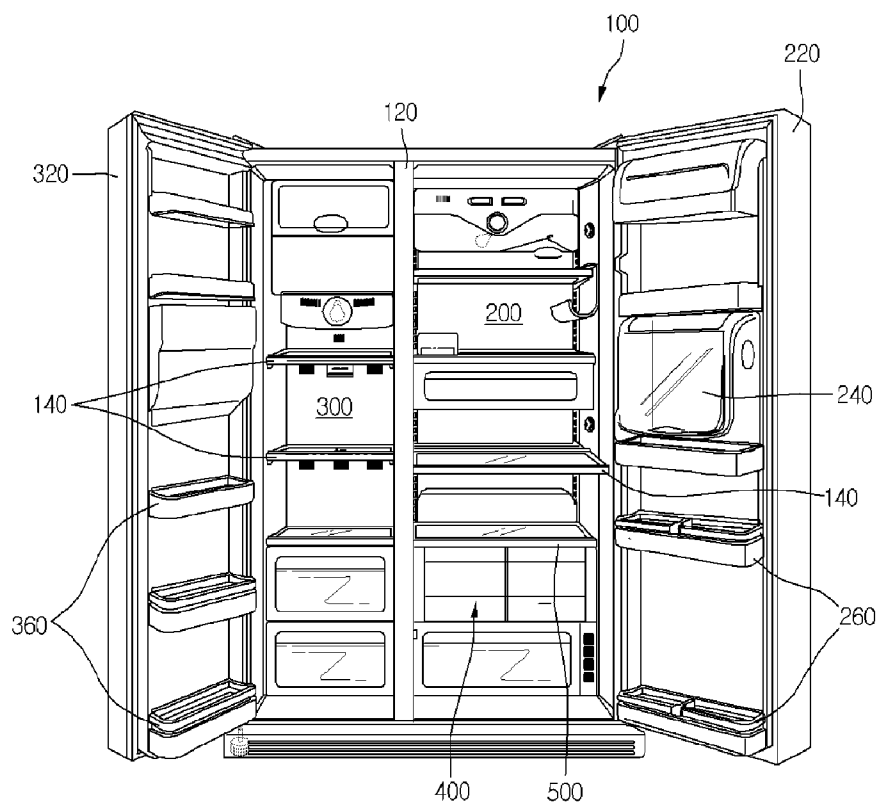
a body in which a food storage space is provided;
a shelf, of which both ends are connected to a side wall of the storage space;
a housing movably connected to the shelf or the side wall of the storage space;
and
a plurality of storage containers, of which a side portion, a bottom portion and a rear portion are supported by the housing and an upper opening is covered by the shelf.

- [11] The refrigerator according to claim 10, wherein a front surface and an upper surface of the housing are opened.
- [12] The refrigerator according to claim 10, wherein a cold air introduction hole is formed at a rear surface of the storage container.
- [13] The refrigerator according to claim 12, wherein a rear surface of the housing is extended from a bottom surface to a point which is lower than the cold air introduction hole.
- [14] The refrigerator according to claim 12, wherein the rear surface of the housing is leveled with the rear surface of the storage container,
and wherein a cold air hole is formed at the rear surface of the housing which is leveled with cold air introduction hole.
- [15] The refrigerator according to claim 10, wherein some of the plurality of storage containers can be moved independently from the housing, or all of the plurality of storage containers can be moved in/out together with the housing.
- [16] The refrigerator according to claim 10, further comprising:
a sliding rail provided at side edges of the housing, and
a rail receiving portion provided at a side surface of the shelf or a side wall of the storage container to receive the sliding rail therein.

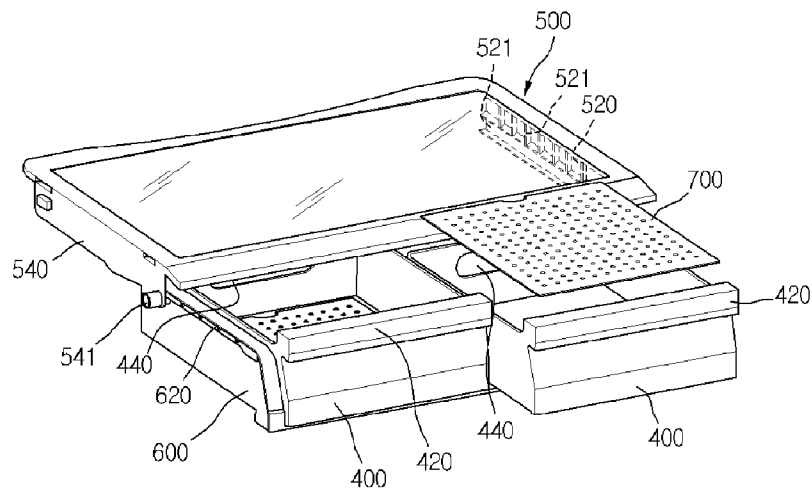
[Fig. 1]



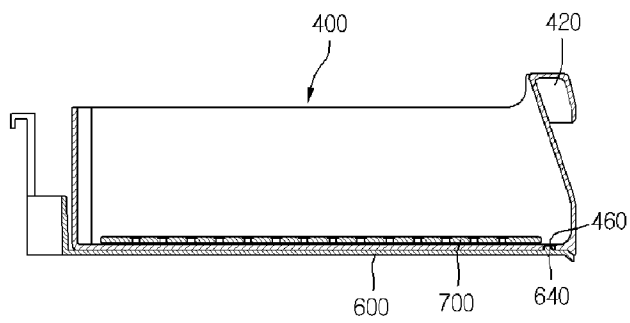
[Fig. 2]



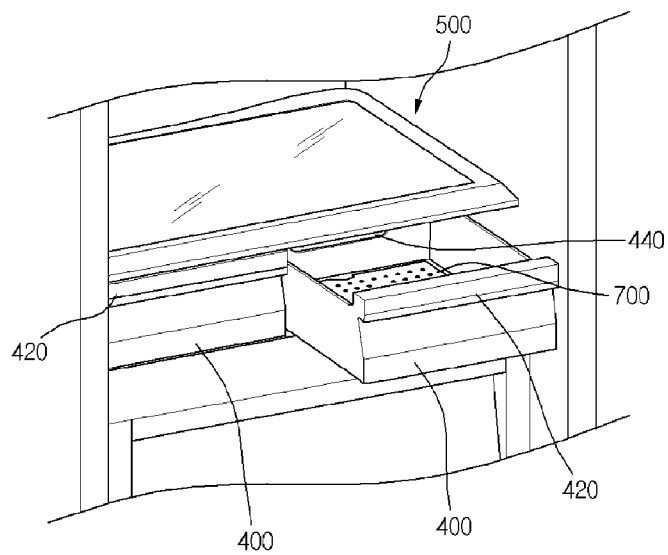
[Fig. 3]



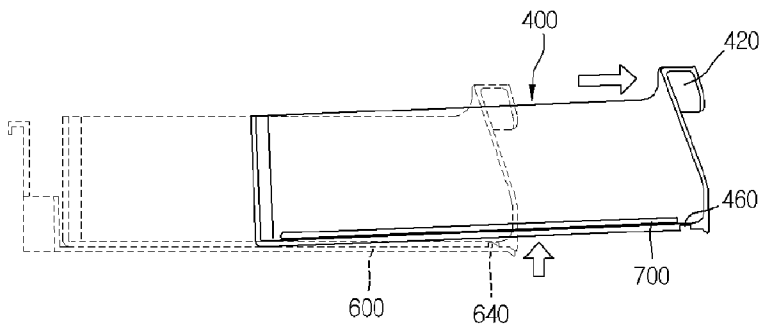
[Fig. 4]



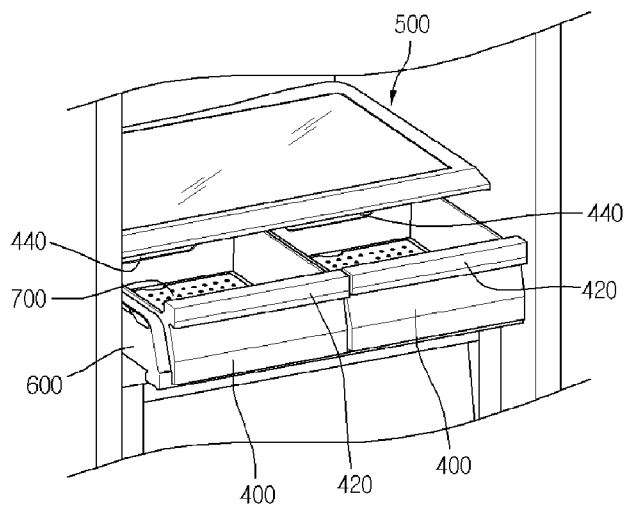
[Fig. 5]



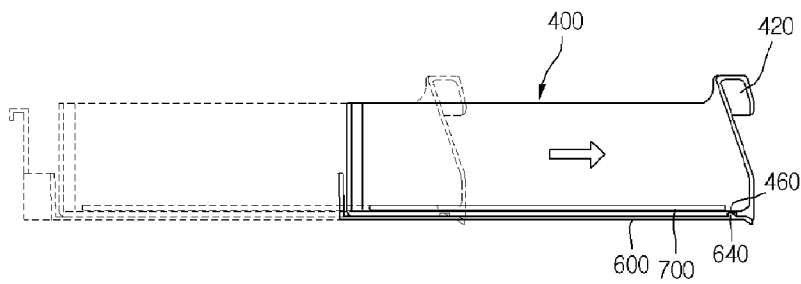
[Fig. 6]



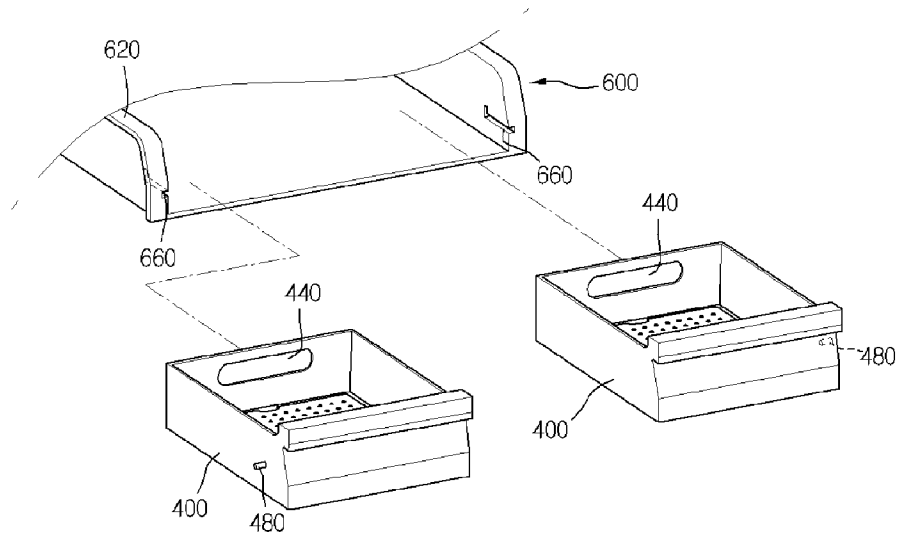
[Fig. 7]



[Fig. 8]



[Fig. 9]



INTERNATIONAL SEARCH REPORT

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PCT/KR2008/001810**A. CLASSIFICATION OF SUBJECT MATTER****F25D 25/02(2006.01)i**

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)

IPC 8: F25D 25/00, 23/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

KIPASS (KIPO internal): "Keyword: shelf, housing, container, interference means, and similar terms"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 20-1992-0012868 U (LG ELECTRONICS INC.) 25 July 1992 See claims 1 and 2; figures 1 and 2.	1-16
A	KR 10-2000-0050415 A (LG ELECTRONICS INC.) 5 August 2000 See abstract; claim 1; figures 2-5.	1-16
A	KR 10-2006-0022428 A (LG ELECTRONICS INC.) 10 March 2006 See abstract; claim 1; figures 3-7.	1-16

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

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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