Title: REFRIGERATOR HAVING A MOVABLE SHELF

Abstract: The present invention relates to a refrigerator (1) comprising: a fresh food compartment (2); and a shelf (3) disposed into the fresh food compartment (2), wherein the shelf (3) has a support surface (4) for storing the articles. The refrigerator (1) of the present invention further comprises: a movable shelf (5) which includes: containers (6) for storing the articles; a support (7) which holds the containers (6); a lid (8) for opening/closing the containers (6); and an opening/closing means (9) adapted to vertically movably attach the support (7) onto the underside of the shelf (3), to selectively allow the user to lower the support (7) to the open state where the lid (8) is relatively removed from the containers (6), to lift the support (7) to the closed state where the lid (8) closes the containers (6), and to lock/unlock the vertical movement of the support (7) in the closed state.
Description

REFRIGERATOR HAVING A MOVABLE SHELF

[0001] The present invention relates to a refrigerator. The present invention more particularly relates to the shelves of the refrigerator.

[0002] Refrigerators are commonly known in the art. A refrigerator generally comprises a fresh food compartment for refrigerating the articles to the set temperatures. In order to increase the user convenience, the fresh food compartment is generally provided with a plurality of shelves. The user can store the various articles by placing them onto the support surfaces of the shelves inside the fresh food compartment.

[0003] A problem with the prior art refrigerator is that many users put the various articles into individual storage cases or bags and place them disorderly in the empty areas on the storage surface of the shelves. Afterwards, the users have difficulties in finding a particular article on the shelves.


[0005] An objective of the present invention is to provide a refrigerator which overcomes the aforementioned problem of the prior art in a cost effective way and which enables the user to easily access the desired articles in the fresh food compartment.

[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 a movable shelf which includes: a plurality of containers for storing the articles respectively; a support which holds the containers; a lid for opening/closing the containers; and an opening/closing means which is adapted to vertically movably attach the support onto the underside of the shelf, to selectively allow the user to lower the support to the open state where the lid is relatively removed from the containers, to lift the support to the closed state where the lid closes the containers, and to lock/unlock the vertical movement of the support in the closed state.

[0008] A major advantageous effect of the present invention is that the user can simultaneously open/close the lid of the containers in the movable shelf,
and thus easily access the desired article on the movable shelf or quickly check the contents of the containers in the movable shelf. Thereby, the user can also save a lot of time when searching for the desired articles. Another major advantageous effect of the present invention is that the user can personalize the containers of the movable shelf to his/her exact requirements, and effectively sort a selection of articles into the containers of the movable shelf, and thus save a lot of place on the support surface of the shelves. Thereby, the articles can be orderly stored in the containers of the movable shelf, and thus the support surface of the shelves can be prevented from becoming untidy. Moreover, the user can dispense with buying additional individual storage cases or bags, and just use the containers of the movable shelf. Thereby, the kitchen can be kept tidy. Another major advantageous effect of the present invention is that the space utilization efficiency of the fresh food compartment has been improved. Thereby, the user satisfaction can be increased.

[0009] In an embodiment, the support rotatably holds the containers. This embodiment is particularly advantageous as the user can rotate the containers form the rear side to the front side, and thus more easily access the articles in the movable shelf.

[0010] In another embodiment, the containers are each removably accommodated in the recesses of the receptacle in the support. This embodiment is particularly advantageous as the user can remove the containers from the receptacle.

[0011] In another embodiment, the lid has closure members which respectively fit into the containers. This embodiment is particularly advantageous as the containers can be more tightly closed, and thus the articles can be kept fresh for a longer time.

[0012] In another embodiment, the opening/closing means has a first bayonet connection which releasably mounts the lid to the underside of the shelf. This embodiment is particularly advantageous as the movable shelf can be easily installed onto the underside of the shelf. The movable shelf can also be uninstalled for cleaning or the like.

[0013] In another embodiment, the opening/closing means comprises a
telescoping connection which vertically movably mounts the support to the
lid. This embodiment is particularly advantageous as the movable shelf
can be easily moved up and down between the closed state and the open
state.

[0014] In another embodiment, the opening/closing means comprises a second
bayonet connection which locks/unlocks the vertical movement of the
support. This embodiment is particularly advantageous as the movable
shelf can be easily locked in place at closed state.

[0015] Additional features and additional advantageous effects of the refrigerator
and the movable shelf of the present invention will become more apparent
with the detailed description of the embodiments with reference to the
accompanying drawings in which:

[0016] Figure 1 - is a schematic front view of a refrigerator which has a movable
shelf according to an embodiment of the present invention, wherein the
movable shelf is in the closed state;

[0017] Figure 2 - is a schematic front view of a refrigerator which has a movable
shelf according to an embodiment of the present invention, wherein the
movable shelf is in the open state;

[0018] Figure 3 - is a schematic perspective view of the refrigerator of Fig. 1;

[0019] Figure 4 - is a schematic perspective view of the refrigerator of Fig. 2;

[0020] Figure 5 - is a schematic side view of a movable shelf according to an
embodiment of the present invention, wherein the movable shelf is in the
closed state;

[0021] Figure 6 - is a schematic side view of a movable shelf according to an
embodiment of the present invention, wherein the movable shelf is in the
open state;

[0022] Figure 7 - is a schematic top view of the movable shelf of Fig. 6;

[0023] Figure 8 - is a schematic sectional perspective view of the movable shelf
of Fig. 7, taken along the line A-A;

[0024] Figure 9 - is a schematic sectional side view of the movable shelf of Fig. 7,
taken along the line A-A;

[0025] Figure 10 - is a schematic exploded perspective view of the movable shelf
of Fig. 6;
[0026] Figure 11 is another schematic exploded perspective view of the movable shelf of Fig. 6;

[0027] Figure 12 is another schematic exploded side view of the movable shelf of Fig. 6.

[0028] The reference signs appearing on the drawings relate to the following technical features.
1. Refrigerator
2. Fresh food compartment
3. Shelf
4. Support surface
5. Movable shelf
6. Container
7. Support
8. Lid
9. Opening/closing means
10. Receptacle
11. Recess
12. Closure member
13. 1st bayonet connection

[0029] 13a. 1st female receptor
[0030] 13b. 1st radial protrusion
[0031] 14. telescoping connection
[0032] 14a. 1st telescoping member
[0033] 14b 2nd telescoping member
[0034] 15. 2nd bayonet connection
[0035] 15a. 2nd female receptor
[0036] 15b. 2nd radial protrusion
[0037] 16. Centering hole

[0038] The refrigerator (1) comprises: a fresh food compartment (2) for refrigerating articles; and a shelf (3) which is disposed into the fresh food compartment (2), wherein the shelf (3) has a support surface (4) for storing the articles (Fig. 1 and Fig.2).

[0039] The refrigerator (1) of the present invention further comprises: a movable
shelf (5) which includes: a plurality of containers (6) for storing the articles respectively; a support (7) which holds the containers (6); a lid (8) for opening/closing the containers (6); and an opening/closing means (9) which is adapted to vertically movably attach the support (7) onto the underside of the shelf (3), to selectively allow the user to lower the support (7) to the open state where the lid (8) is relatively removed from the containers (6), to lift the support (7) to the closed state where the lid (8) closes the containers (6), and to lock/unlock the vertical movement of the support (7) in the closed state (Fig. 3 to Fig. 8).

[0040] In an embodiment, the support (7) is adapted to rotatably hold the containers (6) (Fig. 9).

[0041] In another embodiment, the support (7) comprises a receptacle (10) which has recesses (11) for removably accommodating the containers (6) respectively. In this embodiment, the receptacle (10) is rotatably disposed onto the support (7) (Fig. 10 and Fig. 11).

[0042] In another embodiment, the lid (8) has closure members (12) which respectively fit into the containers (6) (Fig. 11).

[0043] In another embodiment, the opening/closing means (9) comprises a first bayonet connection (13) which releasably mounts the lid (8) to the underside of the shelf (3). The bayonet connection (13) includes: a first female receptor (13a) which can be fixed to the underside of the shelf (3), for instance, through bonding; and first radial protrusions (13b) which engage with the first female receptor (13a), wherein the first radial protrusions (13b) are formed onto the lid (8) (Fig. 10).

[0044] In another embodiment, the opening/closing means (9) comprises a telescoping connection (14) which vertically movably mounts the support (7) to the lid (8). The telescoping connection (14) includes: a first telescoping member (14a) and a second telescoping member (14b) which are nested and relatively rotatable. The first telescoping member (14a) is formed onto the lid (8) whereas the second telescoping member (14b) is formed onto the support (7) (Fig. 9).

[0045] In another embodiment, the opening/closing means (9) comprises a second bayonet connection (15) which locks/unlocks the vertical
movement of the support (7). The second bayonet connection (15) includes: a second female receptor (15a) which is formed into the lid (8); and second radial protrusions (15b) which engage with the second female receptor (15a), wherein the second radial protrusions (15b) are formed onto the second telescoping member (14b) (Fig. 8).

[0046] In another embodiment, the receptacle (10) has a centering hole (16) which receives the 2nd telescoping member (14b) (Fig. 11).

[0047] In the subsequent description, the use of the movable shelf (5) will be briefly explained by way of example.

[0048] First, the user holds the support (7) with the hands, and rotates it in the clockwise or anticlockwise direction to unlock the second bayonet connection (15). Next, the user lowers the support (7) until the telescoping connection (14) is entirely extended (Fig. 3 and Fig. 4). Next, the user rotates the containers (6), if necessary, and removes the desired one for service (Fig. 9). Next, the user performs the above steps in the reversed order to stow away the movable shelf (5) on the underside of the shelf (3) (Fig. 1 and Fig. 2).

[0049] A major advantageous effect of the present invention is that the user can simultaneously open/close the lid (8) of the containers (6) in the movable shelf (5), and thus easily access the desired articles on the movable shelf (5) or quickly check the contents of the containers (6) in the movable shelf (5). Thereby, the user can also save a lot of time when searching for the desired articles. Another major advantageous effect of the present invention is that the user can personalize the containers (6) of the movable shelf (5) to his/her exact requirements, and effectively sort a selection of articles into the containers (6) of the movable shelf (5), and thus save a lot of place on the support surface (4) of the shelves (3). Thereby, the articles can be orderly stored in the containers (6) of the movable shelf (5), and thus the support surface (4) of the shelves (3) can be prevented from becoming untidy. Moreover, the user can dispense with buying additional individual storage cases or bags, and just use the containers (6) of the movable shelf (5). Thereby, the kitchen can be kept tidy. Another major advantageous effect of the present invention is that the space utilization
efficiency of the fresh food compartment (2) has been improved. Thereby, 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 fresh food compartment (2) for refrigerating articles; and a shelf (3) which is disposed into the fresh food compartment (2), wherein the shelf (3) has a support surface (4) for storing the articles, characterized in that a movable shelf (5) which includes: a plurality of containers (6) for storing the articles respectively; a support (7) which holds the containers (6); a lid (8) for opening/closing the containers (6); and an opening/closing means (9) which is adapted to vertically movably attach the support (7) onto the underside of the shelf (3), to selectively allow the user to lower the support (7) to the open state where the lid (8) is relatively removed from the containers (6), to lift the support (7) to the closed state where the lid (8) closes the containers (6), and to lock/unlock the vertical movement of the support (7) in the closed state.

2. The refrigerator (1) according to claim 1, characterized in that the support (7) is adapted to rotatably hold the containers (6).

3. The refrigerator (1) according to claim 2, characterized in that the support (7) comprises a receptacle (10) which has recesses (11) for removably accommodating the containers (6) respectively, wherein the receptacle (10) is rotatably disposed onto the support (7).

4. The refrigerator (1) according to claim 3, characterized in that the lid (8) has closure members (12) which respectively fit into the containers (6).
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. F25D25/02

ADD.

According to International Patent Classification (IPC) and/or national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F25D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.

See patent family annex.

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Name and mailing address of the ISA:
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Authorized officer: Kol ev, Iveli n
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