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(54) **REFRIGERATOR AND CONTROL METHOD THEREFOR**

(57) A refrigerator and method for controlling the same. The refrigerator includes a first motion mechanism (11) for opening and closing a drawer (10), a second motion mechanism for raising and retracting the first storage space (20) within the drawer (10), and a third motion mechanism for raising and retracting the second storage space (30). The control method includes controlling the motion mechanisms based on the direction of a foot movement detected by a sensor. The present arrangement allows for the storage spaces of items to be separated.

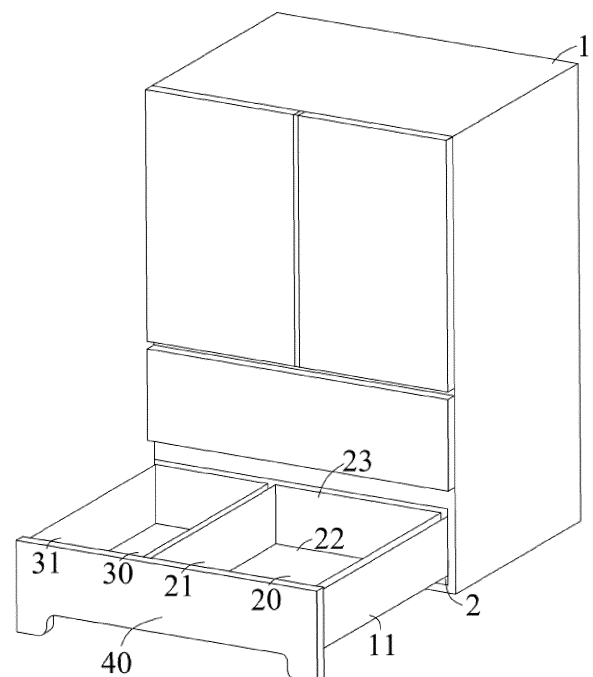


Fig. 2

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Description

TECHNICAL FIELD

[0001] The present application relates to a refrigerator and method for controlling the same, and in particular, to a refrigerator used for storing items and method for controlling the same.

BACKGROUND

[0002] Refrigerators, especially French-style refrigerators, typically feature large pull-out drawers at the bottom. While this pull-out drawer design provides ample storage space, low placement of the drawer necessitates that users bend over and exert force to open it, which could potentially cause chronic spinal injuries over time, particularly inconveniencing elderly users. Existing technologies include designs that adjust the height of the lower drawer using a specific motion mechanism, which automatically or manually raises the drawer to an appropriate height when the drawer door is opened. However, these designs have a drawback: the drawer is a single large compartment, which does not allow for differentiation of storage spaces to meet the diverse needs of users for placing and retrieving items.

SUMMARY

[0003] An object of the present application is to provide a refrigerator and method for controlling the same that capable of distinguishing the storage space of items.

[0004] To achieve the above object, the present application provides a refrigerator, comprising:

a cabinet with a storage compartment formed at lower inside of the cabinet;
a drawer provided within the storage compartment;
and
a first motion mechanism provided between the cabinet and the drawer for opening and closing the drawer;
wherein the drawer comprises a first storage space, a first shell formed around the first storage space, a second motion mechanism connected to the first shell for raising and retracting the first storage space, a second storage space provided laterally adjacent to the first storage space, a second shell formed around the second storage space, and a third motion mechanism connected to the second shell for raising and retracting the second storage space.

[0005] As a further improvement of the present application, both the first shell and the second shell have a base wall and sidewalls extending upward from around the base wall, with both the first and second shells being open at the top in a box-like configuration.

[0006] As a further improvement of the present appli-

cation, the first shell comprises a base wall and sidewalls extending upward from around the base wall, the sidewalls comprise a first sidewall provided along the opening direction of the drawer, the second shell comprises a second sidewall provided parallel to and spaced from the first sidewall, the second sidewall extending toward the first sidewall to form a third sidewall and a fourth sidewall, the second shell further comprises a movable wall formed between the third sidewall and the fourth sidewall and perpendicular to the third sidewall and the fourth sidewall, one end of the movable wall is pivotally connected to an lower edge of the second sidewall and the other end is pivotally connected to an upper edge of the first sidewall.

[0007] As a further improvement of the present application, the volume of the second storage space is smaller than the volume of the first storage space, and the movable wall is sloping between the first sidewall and the second sidewall with the drawer is closed.

[0008] As a further improvement of the present application, the drawer is provided with a sensor module for detecting a moving state of a person's foot, and the refrigerator comprises a control module provided on the cabinet, wherein the control module is in communication with the sensor module, the first motion mechanism, the second motion mechanism, and the third motion mechanism.

[0009] As a further improvement of the present application, the drawer comprises a drawer door for closing the storage compartment, a lower end of the drawer door is recessed upwards to form a recessed area, with the sensor module located within the recessed area.

[0010] As a further improvement of the present application, the second motion mechanism and the third motion mechanism comprises gears, racks, stepper motors, and rails working in conjunction.

[0011] To achieve the above object, the present application further provides a control method for a refrigerator, characterized in that, the control method comprising the following steps:

acquiring an open door signal;
controlling the first motion mechanism to open the drawer after acquiring the open door signal;
controlling the sensor module to detect direction of a foot movement;
determining the foot moves from right to left to control the second motion mechanism to raise the first storage space;
determining the foot moves from left to right to control the third motion mechanism to raise the second storage space.

[0012] As a further improvement of the present application, the control method further comprising:

detecting a range of the foot movement by the sensor module;
controlling an operating range of the second and

third motion mechanisms based on the range of the foot movement, the operating range of the second and third motion mechanisms are directly proportional to the range of the foot movement.

[0013] As a further improvement of the present application, the control method further comprising:

determining whether a door closing signal is acquired;
controlling the second motion mechanism to retract the first storage space to an initial position, controlling the third motion mechanism to retract the second storage space to an initial position, and controlling the first motion mechanism to close the drawer, in a case of a door closing signal is acquired;
determining whether the foot has left by controlling the sensor module in a case of none of a door closing signal is acquired;
controlling the second motion mechanism to retract the first storage space to the initial position, controlling the third motion mechanism to retract the second storage space to the initial position, and controlling the first motion mechanism to close the drawer, in a case of determining the foot has left and without acquiring the door closing signal after "a" seconds.

[0014] Compared to the prior art, the beneficial effect of the present application is that it is possible to differentiate the storage space of the items.

BRIEF DESCRIPTION OF DRAWINGS

[0015] Further detailed explanations of the specific embodiments of the present application are provided below, in conjunction with the accompanying figures:

FIG. 1 is a schematic diagram of the refrigerator according to the present application;
FIG. 2 is a schematic diagram of the drawer in an open status, as seen in Figure 1;
FIG. 3 is schematic diagram where the first storage space is in a raised position, as shown in Figure 2;
FIG. 4 is a schematic diagram of the gear and rack interaction of the second and third motion mechanisms;
FIG. 5 is a schematic diagram of the arrangement of gears, stepper motors, and support rods of the second and third motion mechanisms;
FIG. 6 is a schematic diagram of the preferred structure of the drawer, as seen in Figure 2;
FIG. 7 is a schematic diagram of the second storage space in a retracted status, as shown in Figure 6;
FIG. 8 is a schematic diagram of the structure of the gear and rack of the third motion mechanism, as seen in Figure 6;
FIG. 9 is a schematic diagram of the structure of the drawer door, as seen in Figure 2;

FIG. 10 is a flowchart illustrating the control method of the refrigerator as proposed by the present application;

FIG. 11 is a detailed flowchart illustrating the control method shown in Figure 10;

FIG. 12 is an optimized flowchart of the control method shown in Figure 10.

DETAILED DESCRIPTION OF EMBODIMENTS

[0016] The following detailed description of the embodiments of the present application is provided in conjunction with the accompanying drawings. However, these embodiments do not limit the invention; any structural, methodological, or functional modifications made by those skilled in the art based on these embodiments fall within the scope of protection of the present application.

[0017] Figure 1 is a schematic diagram of the refrigerator according to the present application.

[0018] Figure 2 is a schematic diagram of the drawer 10 in an open status, as seen in Figure 1.

[0019] Figure 3 is schematic diagram where the first storage space 20 is in a raised position, as shown in Figure 2.

[0020] As shown in Figure 1, the refrigerator includes a cabinet 1 with a storage compartment 2 formed at lower inside of the cabinet 1, a drawer 10 provided within the storage compartment 2, and a first motion mechanism 11 provided between the cabinet 1 and the drawer 10 for opening and closing the drawer 10. The drawer 10 includes a first storage space 20, a first shell 21 formed around the first storage space 20, a second motion mechanism connected to the first shell 21 for raising and retracting the first storage space 20, a second storage space 30 provided laterally adjacent to the first storage space 20, a second shell 31 formed around the second storage space 30, and a third motion mechanism connected to the second shell 31 for raising and retracting the second storage space 30.

[0021] The drawer 10 also includes a drawer door 40, drawer door 40 is connected to the third motion mechanism. When the drawer 10 is retracted into the storage compartment 2, the drawer door 40 can close the storage compartment 2, thereby preventing the leakage of cold air from inside the storage compartment 2.

[0022] The third motion mechanism only needs to facilitate the opening and closing of drawer 10, and it can be either electric or manual. For instance, the third motion structure might configured as rails installed on both sides of drawer 10 and grooves set on cabinet 1 to align with these rails, as well as a servo motor that drives the rails to move back and forth within the grooves.

[0023] Such a configuration allows drawer 10 to be divided into two independently accessible storage spaces, enabling users to raise or retract different storage spaces according to their specific access needs, thereby meeting the diverse storage and retrieval demands of users.

[0024] Both the first shell 21 and the second shell 31

may have a base wall 22 and sidewalls 23 extending upward from around the base wall 22, with both the first and second shells being open at the top in a box-like configuration.

[0025] This configuration facilitates the placement and retrieval of items, simplifies the structure, reduces manufacturing costs, and maximizes the utilization of the storage space.

[0026] Preferably, the volume of the second storage space 30 is smaller than that of the first storage space 20. The second storage space 30 is used for temporarily placing items, while the first storage space 20 is used for storing items.

[0027] With this structural design, in practical use, when a user has multiple items to place, they can initially place items in the second storage space 30, and then gradually transfer them to the first storage space 20. This arrangement prevents the need for users to frequently bend down to pick up items from the ground.

[0028] When users need to remove various items from the first storage space 20, they can remove the items one by one from the first storage space 20, place them back into the first storage space 20, and then take all the items to be removed at once from the first storage space 20.

[0029] Additionally, the first storage space 20, serving as a dedicated storage space, often contains a large number of items with a significant overall weight. Consequently, the load on the second motion mechanism is generally much greater than that on the third motion mechanism. Therefore, the lifting and lowering operations of the second motion mechanism tend to be slower, consume more energy, and suffer greater wear over prolonged use. In contrast, the third motion mechanism is more agile and flexible, incurs less wear, and uses less energy. Such a design enhances the operational flexibility and reliability of the drawer 10, increases the overall lifespan of the drawer 10, and saves energy.

[0030] For these reasons, dividing the storage space of the drawer 10 into dedicated spaces for placing and retrieving items facilitates the handling of items by users, meets their diverse usage needs, and improves the operational flexibility and reliability of drawer 10. This also enhances the overall lifespan of the drawer 10 while conserving energy.

[0031] Preferably, the second and third motion mechanisms include gears 12, racks 13, stepper motors 14, and rails working in conjunction.

[0032] Figure 4 is a schematic diagram of the gear 12 and rack 13 interaction of the second and third motion mechanisms.

[0033] As illustrated in Figure 4, the second and third motion mechanisms may utilize the interplay between gears 12 and racks 13 to achieve the raising and retracting of the first storage space 20 and the second storage space 30.

[0034] The gears 12 can be mounted on the first shell 21 and the second shell 31, while the corresponding

racks 13 can be set up on the drawer door 40 to engage with gears 12, or on the first motion mechanism 11.

[0035] Alternatively, the gears 12 may be provided on the drawer door 40 or the first motion mechanism 11, and the racks 13 may be configured to engage with them on the first shell 21 and the second shell 31.

[0036] This setup allows for high precision in movement, enabling accurate control of the speed, extent, and direction of operation of the second and third motion mechanisms. The structure is simple, easy to assemble, and cost-effective.

[0037] Figure 5 is a schematic diagram of the arrangement of gears 12, stepper motors 14, and support rods 15 of the second and third motion mechanisms.

[0038] As shown in Figure 5, the second and third motion mechanisms use stepper motors 14 to drive gears 12 to rotate relative to racks 13, thereby facilitating the raising and retracting of the first storage space 20 and the second storage space 30.

[0039] There can be two gears 12, connected by a support rod 15, which enables the synchronized operation of both gears 12. The support rod 15 can be placed under the front end of the first shell 21 or the second shell 31 to provide support. The rear end of the first shell 21 and the second shell 31 can provide a structure where vertically movable rails and tracks are coordinated with each other.

[0040] This setup ensures high motion precision and allows for accurate control of the operation speed, extent, and direction of the second and third motion mechanisms. The structure is simple, easy to assemble, and cost-effective.

[0041] Figure 6 is a schematic diagram of the preferred structure of the drawer 10, as seen in Figure 2.

[0042] As illustrated in Figure 6, the first shell 21 includes a base wall 22 and sidewalls 23 extending upward from around the base wall 22. The sidewalls 23 include a first sidewall 24 provided along the opening direction of the drawer 10. The second shell 31 includes a second sidewall 25 that is parallel to and spaced from the first sidewall 24, the second sidewall 25 extending to form a third sidewall 26 and a fourth sidewall 27 toward the first sidewall 24. Additionally, the second shell 31 includes a movable wall 28 formed between the third sidewall 26 and the fourth sidewall 27, perpendicular to the third sidewall 26 and the fourth sidewall 27. One end of the movable wall 28 is pivotally connected to the lower edge of the second sidewall 25, and the other end is pivotally connected to the upper edge of the first sidewall 24.

[0043] The movable wall 28 can be connected by hinges to the first sidewall 24 and the second sidewall 25. The second sidewall 25, the third sidewall 26, and the fourth sidewall 27 act as barriers, preventing items within the second storage space 30 from falling out.

[0044] When the movable wall 28 is slightly sloping downwards, horizontally, or upwards, it can be used for temporarily placing items. When the movable wall 28 is steeply sloping upwards, items resting on it can automat-

ically slide into the first storage space 20.

[0045] When there is sufficient space in the first storage space 20 and the items to be placed are suitable, users can raise the second storage space 30 to a certain height, place items into the second storage space 30, and then continue to slowly raise the second storage space 30, allowing the items to automatically slide into the first storage space 20.

[0046] This arrangement facilitates the placement and retrieval of items, meets the diverse usage needs of users, and enhances the operational flexibility and reliability of drawer 10. It also extends the overall lifespan of the drawer 10 while saving energy.

[0047] Figure 7 is a schematic diagram of the second storage space 30 in a retracted status, as shown in Figure 6.

[0048] As showing in Figure 7, preferably, the volume of the second storage space 30 is smaller than that of the first storage space 20. When drawer 10 is closed, the movable wall 28 is set at an incline between the first sidewall 24 and the second sidewall 25.

[0049] This configuration not only facilitates the placement and retrieval of items by users but also minimizes the occupation of storage space, allowing drawer 10 to accommodate more items.

[0050] Figure 8 is a schematic diagram of the structure of the gear 12 and rack 13 of the third motion mechanism of the second storage space 30, as seen in Figure 6.

[0051] As shown in Figure 8, the second storage space 30 not only moves vertically but also horizontally. The gear 12 can be positioned on the third sidewall 26, while the rack 13 can be set to mesh with the gear 12 and shaped according to the movement trajectory of the rack 13 into an arc.

[0052] This arrangement allows for high motion precision and enables accurate control of the operating speed, extent, and direction of the third motion mechanism. The structure is simple, easy to assemble, and cost-effective.

[0053] Preferably, the drawer 10 is provided with a sensor module 43 for detecting the moving state of a person's foot. The refrigerator includes a control module mounted on the cabinet 1, which is in communication with the sensor module 43, the first motion mechanism 11, the second motion mechanism, and the third motion mechanism.

[0054] The control module can control the first motion mechanism 11, the second motion mechanism, and the third motion mechanism based on the moving state of a person's foot detected by the sensor module 43. In practical use, when a user's hands are occupied, or it is inconvenient to use hands for other reasons, the user can control the drawer 10 with their foot.

[0055] The sensor module 43 can be a position movement sensor.

[0056] This setup allows for control of drawer 10 based on the moving state of a person's foot, thereby freeing the user's hands for easier access and placement of items, and meeting diverse user needs.

[0057] Figure 9 is a schematic diagram of the structure of the drawer door 40, as seen in Figure 2.

[0058] As illustrated in Figure 9, the drawer 10 includes a drawer door 40 for closing the storage compartment 2. A lower end 41 of the drawer door 40 is recessed upwards to form a recessed area 42, with the sensor module 43 can preferably be located. The recessed area 42 is designed to accommodate foot with moving inside. The sensing area of sensor module 43 is confined within this recessed area 42.

[0059] This arrangement enables the concealed installation of sensor module 43, preventing misidentification by the sensor module 43 and making the system easy to operate, simple in structure, and convenient to assemble and disassemble.

[0060] Figure 10 is a flowchart illustrating the control method for the refrigerator of the present application.

[0061] As shown in Figure 10, the control method includes the following steps:

- acquiring an open door signal;
- controlling the first motion mechanism 11 to open drawer 10 after acquiring the open door signal;
- controlling the sensor module 43 to detect direction of a foot movement;
- determining the foot moves from right to left to control the second motion mechanism to raise the first storage space 20;
- determining the foot moves from left to right to control the third motion mechanism to raise the second storage space 30.

[0062] The open door signal can be activated in various ways, such as by voice activation, knocking on the door, pulling the door, or using a touch screen.

[0063] This setup allows the control of drawer 10 based on the moving state of a person's foot, thereby freeing the user's hands for easier access and placement of items, fulfilling diverse user needs.

[0064] Figure 11 is a detailed flowchart illustrating the control method shown in Figure 10.

[0065] As shown in Figure 11, the control method further includes the following steps:

- detecting a range of the foot movement by the sensor module;
- controlling an operating range of the second and third motion mechanisms based on the range of the foot movement, the operating range of the second and third motion mechanisms are directly proportional to the range of the foot movement.

[0066] This setup allows the control of drawer 10 based on the moving state of a person's foot, thereby freeing the user's hands for easier access and placement of items, fulfilling diverse user needs.

[0067] Figure 12 is an optimized flowchart of the control method shown in Figure 10.

[0068] As illustrated in Figure 12, the control method includes the following steps:

determining whether a door closing signal is acquired;
controlling the second motion mechanism to retract the first storage space 20 to an initial position, controlling the third motion mechanism to retract the second storage space 30 to an initial position, and controlling the first motion mechanism 11 to close the drawer 10, in a case of a door closing signal is acquired;
determining whether the foot has left by controlling the sensor module 43 in a case of none of a door closing signal is acquired;
controlling the second motion mechanism to retract the first storage space 20 to the initial position, controlling the third motion mechanism to retract the second storage space 30 to the initial position, and controlling the first motion mechanism 11 to close the drawer 10, in a case of determining the foot has left and without acquiring the door closing signal after "a" seconds.

[0069] The door closing signal can be activated in various ways, such as a voice control, knocking on the door, pushing the door inward, or using a touchscreen.

[0070] This setup ensures that drawer 10 closes promptly when not in use, preventing the escape of cold air and spoilage of food, thereby enhancing the efficiency and user experience of the refrigerator.

[0071] In summary, the technical solutions provided by the present application effectively address the issues present in existing technology where drawer 10 is a single large compartment that cannot differentiate storage spaces, failing to meet the diverse needs of users for storing and retrieving items. The technical solutions offered by the present application enable the segregation of storage spaces, facilitating user access to and placement of items, satisfying a variety of user needs, and enhancing the operational flexibility and reliability of drawer 10. They also extend the overall lifespan of drawer 10 while saving energy, and allow the control of drawer 10 based on the moving state of a person's foot, thereby freeing the user's hands.

[0072] It should be understood that while this description is drafted in terms of embodiments for clarity, not every embodiment contains a single independent technical solution. The narrative style of this description is intended solely for clarity, and those skilled in the art should consider this description as a whole. The technical solutions in each embodiment may be appropriately combined to form other implementations understandable to those skilled in the art.

[0073] The series of detailed explanations listed above are merely specific explanations of feasible embodiments of the present application and are not intended to limit the scope of the present application. Any equivalent

implementations or modifications made without departing from the spirit of the present application should be included within the scope of the present application.

Claims

1. A refrigerator comprising:

a cabinet with a storage compartment formed at lower inside of the cabinet;
a drawer provided within the storage compartment; and
a first motion mechanism provided between the cabinet and the drawer for opening and closing the drawer;
characterized in that the drawer comprises a first storage space, a first shell formed around the first storage space, a second motion mechanism connected to the first shell for raising and retracting the first storage space, a second storage space provided laterally adjacent to the first storage space, a second shell formed around the second storage space, and a third motion mechanism connected to the second shell for raising and retracting the second storage space.

2. The refrigerator according to claim 1, **characterized in that** both the first shell and the second shell have a base wall and sidewalls extending upward from around the base wall, with both the first and second shells being open at the top in a box-like configuration.

3. The refrigerator according to claim 1, **characterized in that** the first shell comprises a base wall and sidewalls extending upward from around the base wall, the sidewalls comprises a first sidewall provided along the opening direction of the drawer, the second shell comprises a second sidewall provided parallel to and spaced from the first sidewall, the second sidewall extending toward the first sidewall to form a third sidewall and a fourth sidewall, the second shell further comprises a movable wall formed between the third sidewall and the fourth sidewall and perpendicular to the third sidewall and the fourth sidewall, one end of the movable wall is pivotally connected to a lower edge of the second sidewall and the other end is pivotally connected to an upper edge of the first sidewall.

4. The refrigerator according to claim 3, **characterized in that** the volume of the second storage space is smaller than the volume of the first storage space, and the movable wall is sloping between the first sidewall and the second sidewall with the drawer is closed.

5. The refrigerator according to claim 1, **characterized in that** the drawer is provided with a sensor module for detecting a moving state of a person's foot, and the refrigerator comprises a control module provided on the cabinet, wherein the control module is in communication with the sensor module, the first motion mechanism, the second motion mechanism, and the third motion mechanism. 5
6. The refrigerator according to claim 5, **characterized in that** the drawer comprises a drawer door for closing the storage compartment, a lower end of the drawer door is recessed upwards to form a recessed area, with the sensor module located within the recessed area. 10 15
7. The refrigerator according to claim 1, **characterized in that** the second motion mechanism and the third motion mechanism comprises gears, racks, stepper motors, and rails working in conjunction. 20
8. A control method for a refrigerator, **characterized in that**, the control method comprising the following steps: 25
- acquiring an open door signal;
controlling the first motion mechanism to open the drawer after acquiring the open door signal;
controlling the sensor module to detect direction of a foot movement; 30
determining the foot moves from right to left to control the second motion mechanism to raise the first storage space;
determining the foot moves from left to right to control the third motion mechanism to raise the second storage space. 35
9. The control method according to claim 8, **characterized in that**, the control method further comprising: 40
- detecting a range of the foot movement by the sensor module;
controlling an operating range of the second and third motion mechanisms based on the range of the foot movement, the operating range of the second and third motion mechanisms are directly proportional to the range of the foot movement. 45
10. The control method according to claim 9, **characterized in that**, the control method further comprising: 50
- determining whether a door closing signal is acquired;
controlling the second motion mechanism to retract the first storage space to an initial position, controlling the third motion mechanism to retract the second storage space to an initial position, 55

and controlling the first motion mechanism to close the drawer, in a case of a door closing signal is acquired;
determining whether the foot has left by controlling the sensor module in a case of none of a door closing signal is acquired;
controlling the second motion mechanism to retract the first storage space to the initial position, controlling the third motion mechanism to retract the second storage space to the initial position, and controlling the first motion mechanism to close the drawer, in a case of determining the foot has left and without acquiring the door closing signal after "a" seconds.

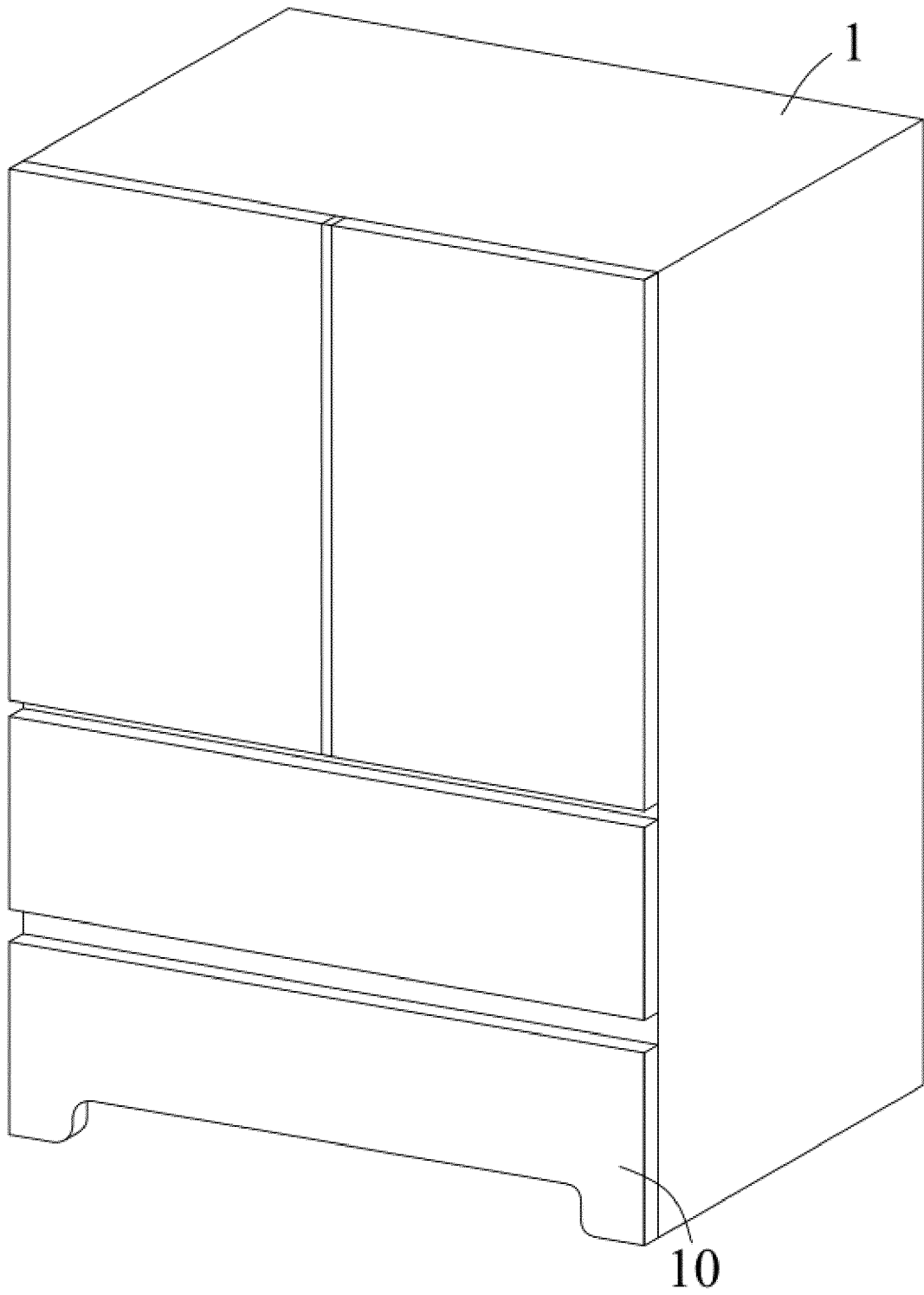


Fig. 1

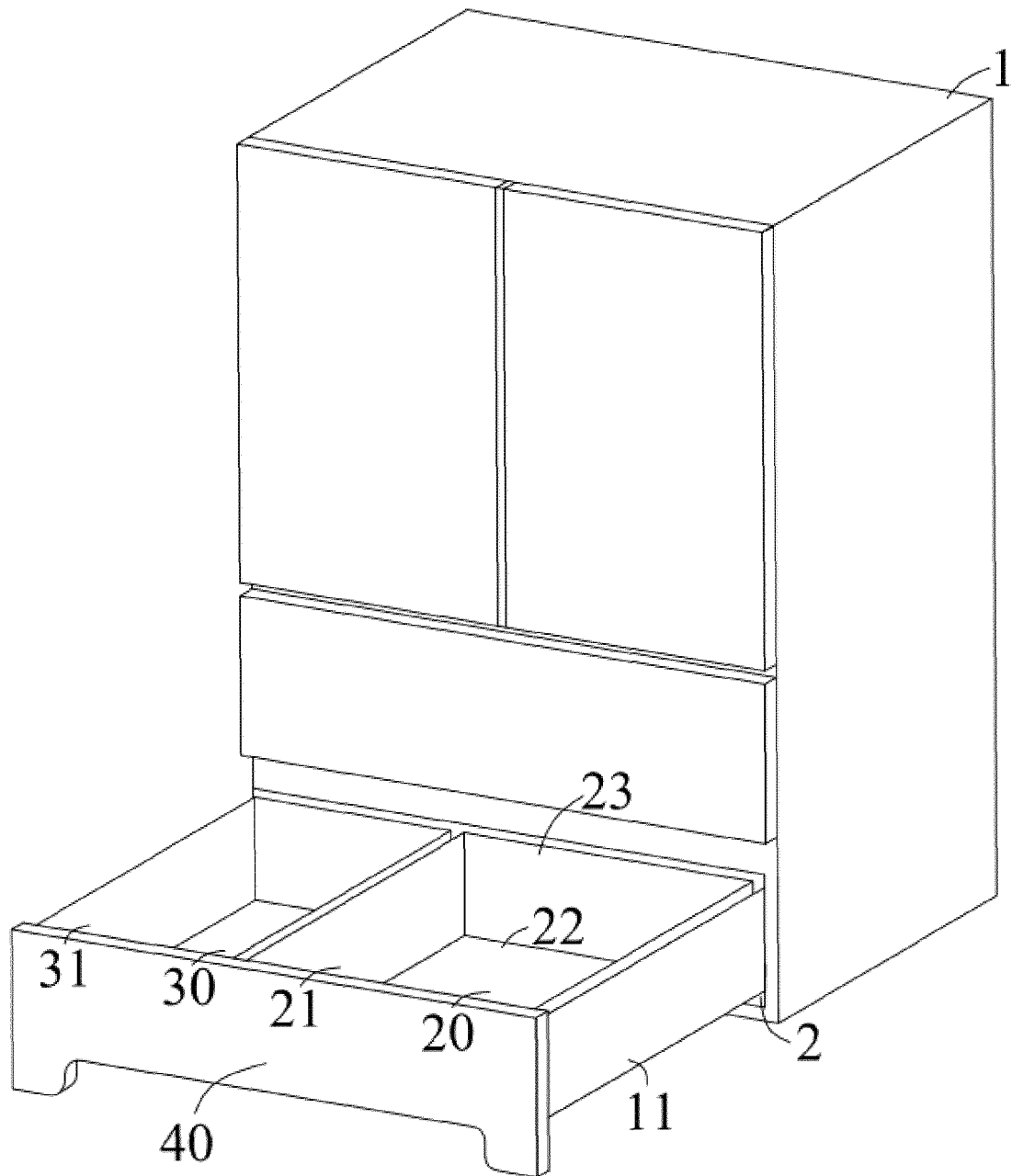


Fig. 2

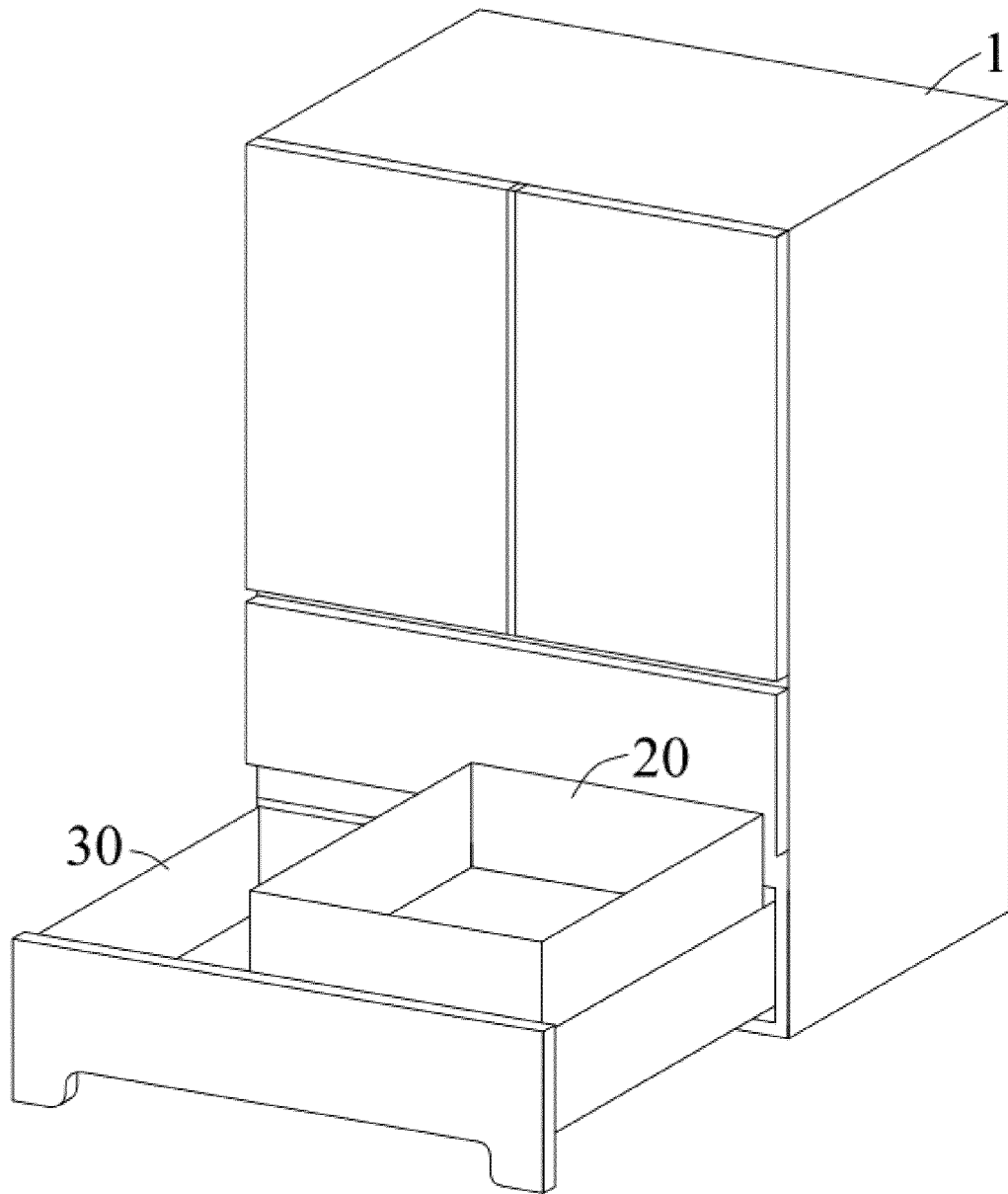


Fig. 3

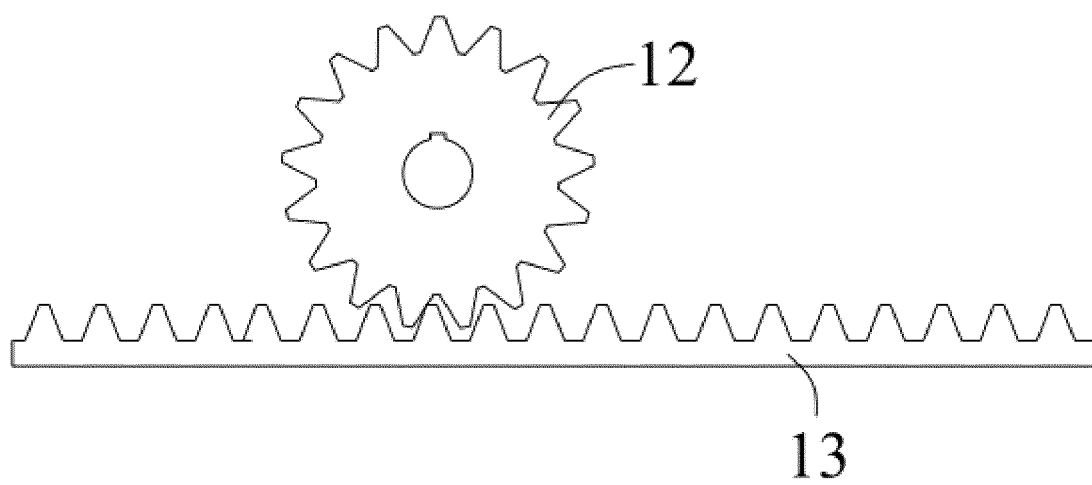


Fig. 4

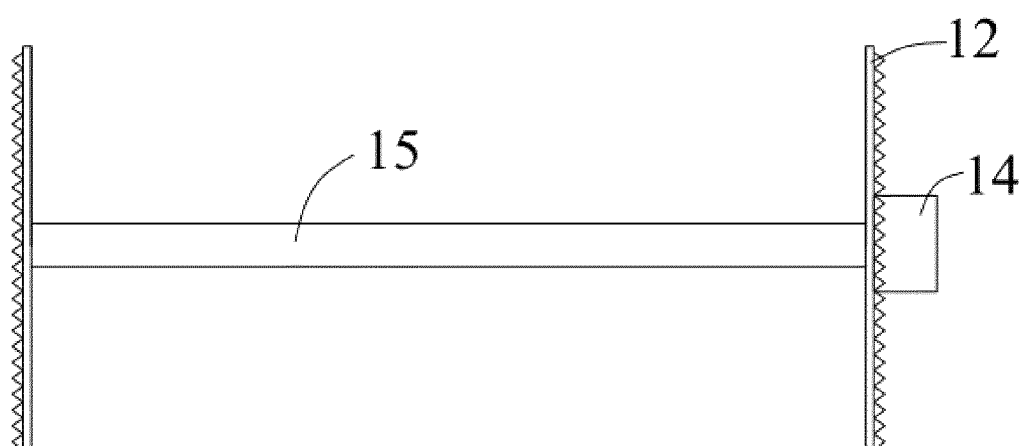


Fig. 5

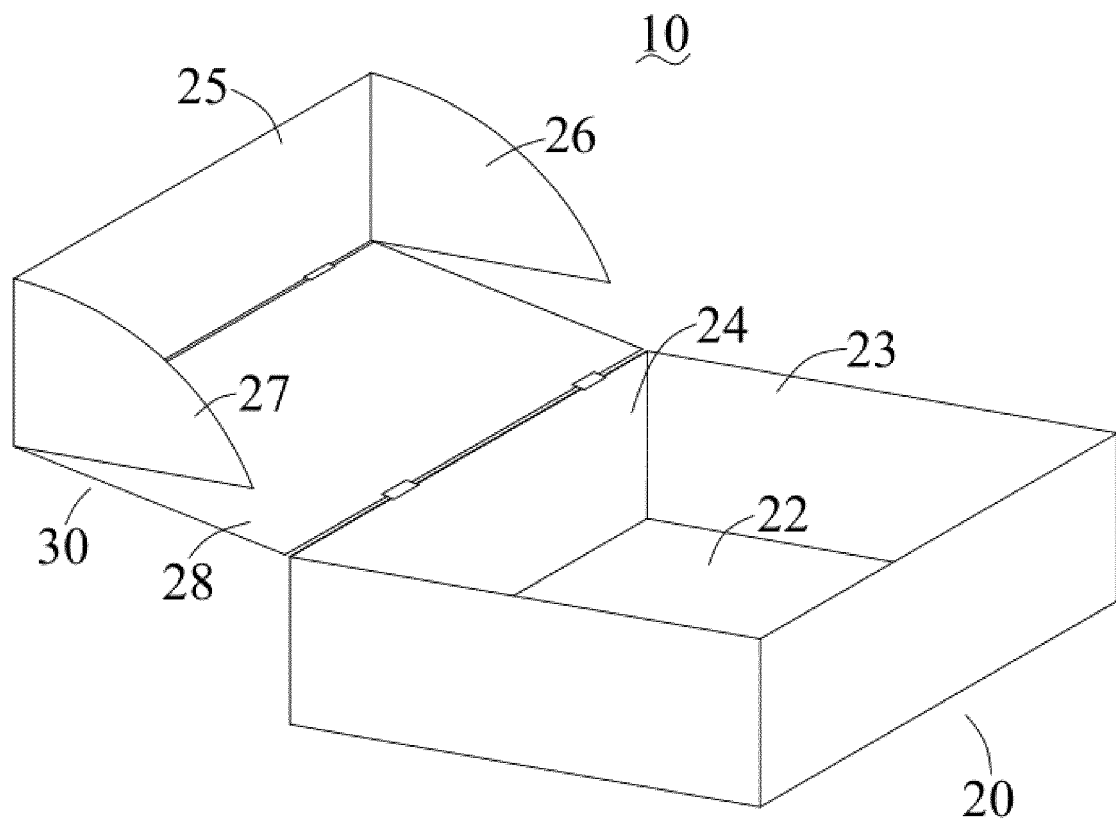


Fig. 6

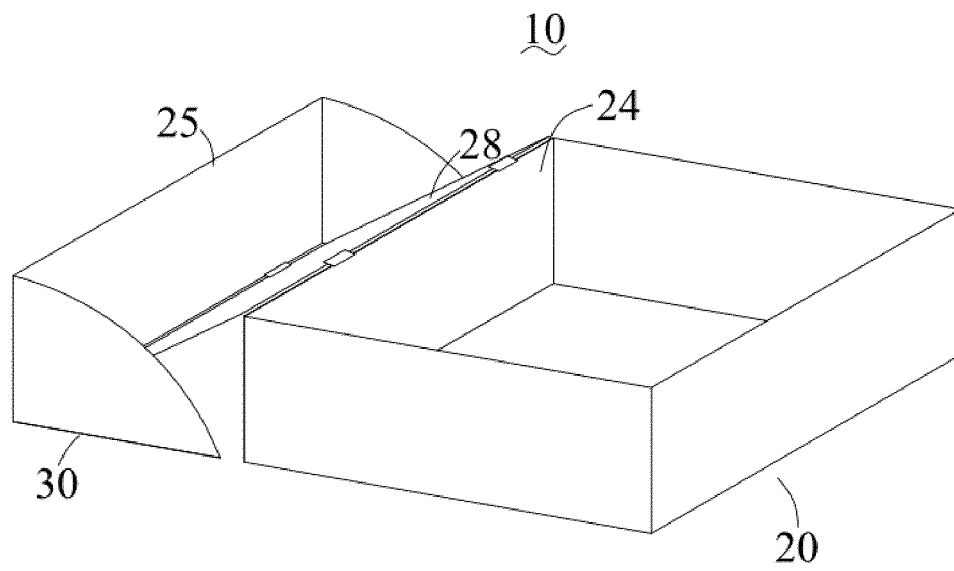


Fig. 7

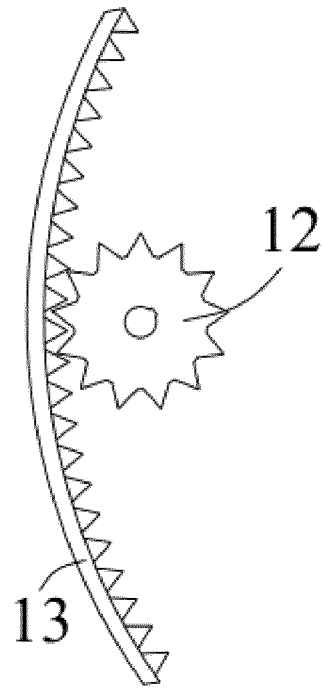


Fig. 8

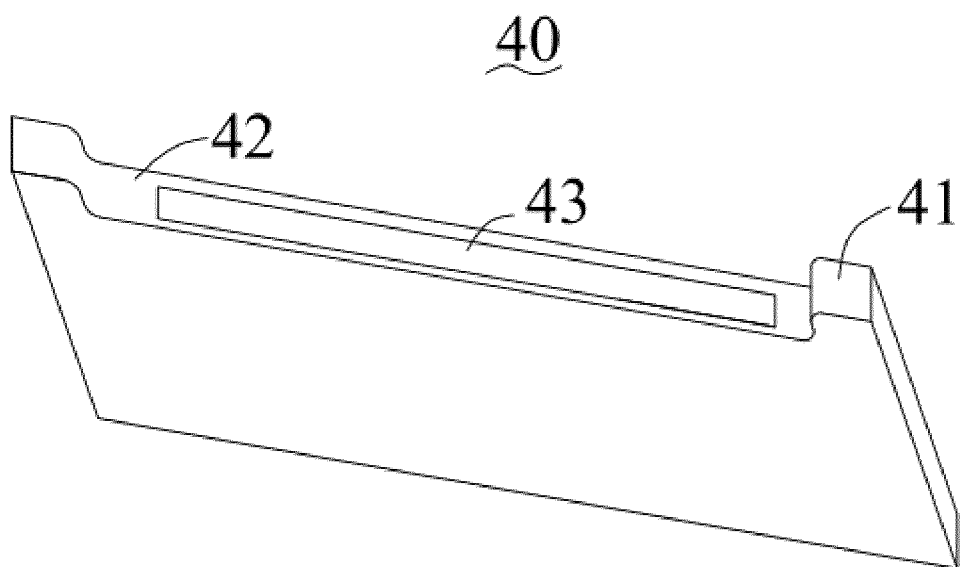


Fig. 9

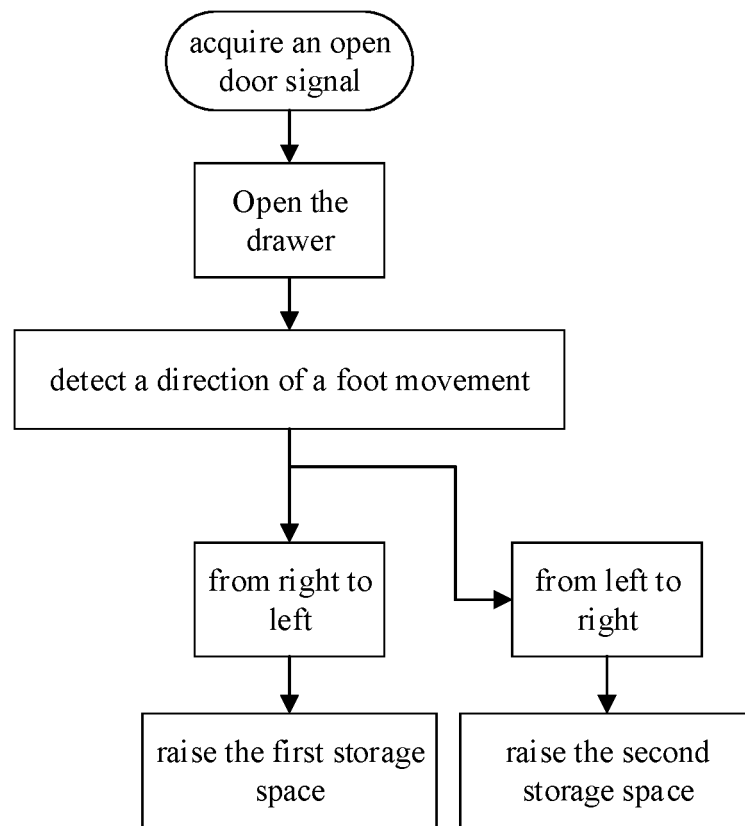


Fig. 10

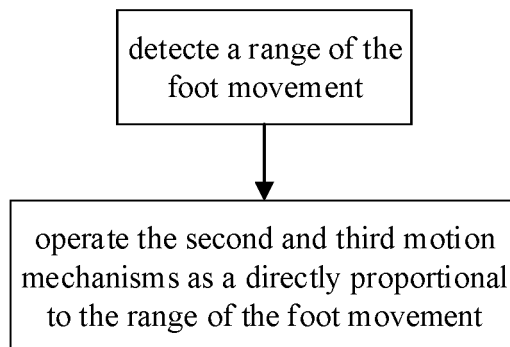


Fig. 11

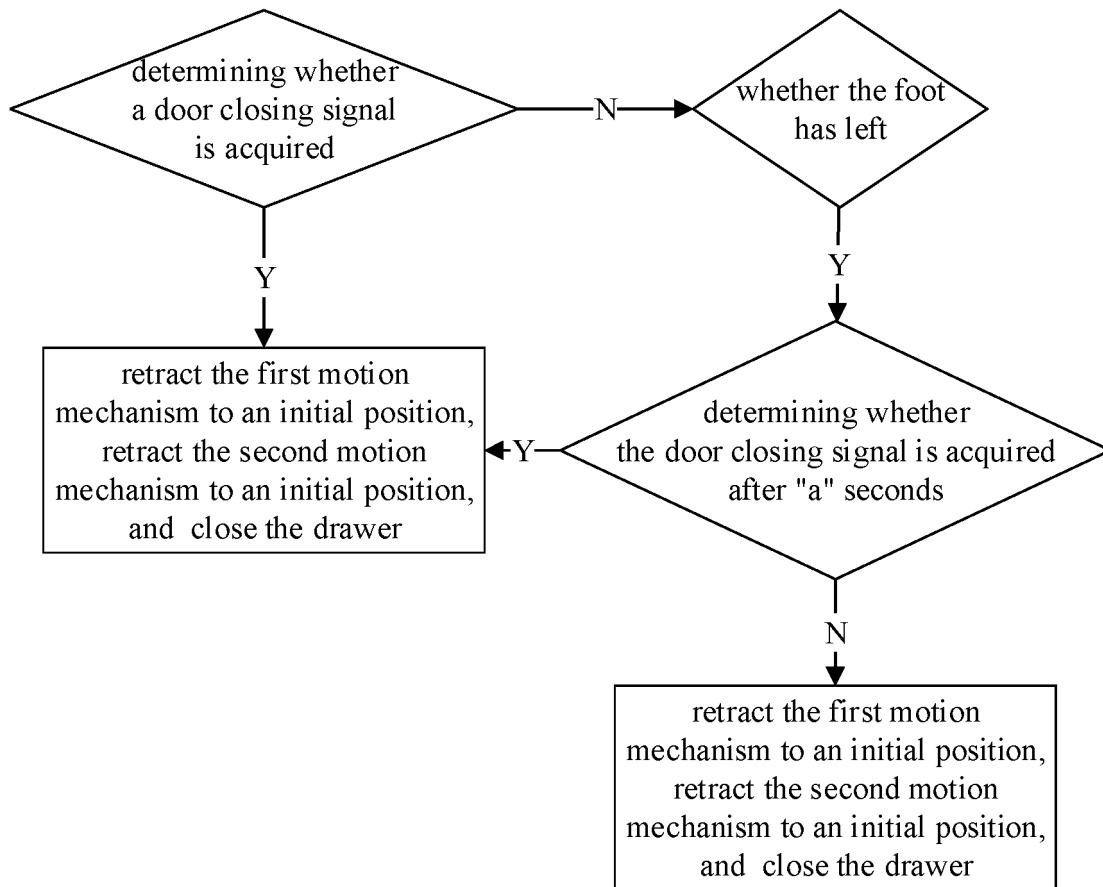


Fig. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/136931

A. CLASSIFICATION OF SUBJECT MATTER F25D11/02(2006.01);F25D25/02(2006.01);F25D29/00(2006.01); 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) F25D11/-,F24D25/-,F25D29-																					
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) CNTXT, CNABS, DWPI, VEN, WPABS, WPABSC, PATENTICS: 海尔, 王洪明, 刘明坤, 谢丽君, 冰箱, 储物, 箱体, 腔室, 抽屉, 升降, 升起, 收回, 运动, 壳, 分区, 弯腰, 移动, 位移, 竖直, 水平, refrigerator, storage, box, chamber, drawer, lift+, retract+, mov+, shell, partition, bend+, displac+, vertical, horizontal																					
C. DOCUMENTS CONSIDERED TO BE RELEVANT																					
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>CN 104101171 A (TAIZHOU LG ELECTRONICS REFRIGERATOR CO., LTD.) 15 October 2014 (2014-10-15) description, paragraphs [0025]-[0029], and figures 1-3</td> <td>1-2, 7</td> </tr> <tr> <td>Y</td> <td>CN 104101171 A (TAIZHOU LG ELECTRONICS REFRIGERATOR CO., LTD.) 15 October 2014 (2014-10-15) description, paragraphs [0025]-[0029], and figures 1-3</td> <td>5-6, 8-10</td> </tr> <tr> <td>Y</td> <td>CN 107401870 A (HEFEI HUALING CO., LTD. et al.) 28 November 2017 (2017-11-28) description, paragraphs [0028]-[0043]</td> <td>5-6, 8-10</td> </tr> <tr> <td>Y</td> <td>CN 105241169 A (QINGDAO HAIER CO., LTD.) 13 January 2016 (2016-01-13) description, paragraphs [0020]-[0050], and figures 1-2</td> <td>1-2, 5-10</td> </tr> <tr> <td>Y</td> <td>CN 107388718 A (HEFEI HUALING CO., LTD. et al.) 24 November 2017 (2017-11-24) description, paragraphs [0034]-[0041]</td> <td>1-2, 5-10</td> </tr> <tr> <td>A</td> <td>CN 205119642 U (QINGDAO HAIER CO., LTD.) 30 March 2016 (2016-03-30) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	CN 104101171 A (TAIZHOU LG ELECTRONICS REFRIGERATOR CO., LTD.) 15 October 2014 (2014-10-15) description, paragraphs [0025]-[0029], and figures 1-3	1-2, 7	Y	CN 104101171 A (TAIZHOU LG ELECTRONICS REFRIGERATOR CO., LTD.) 15 October 2014 (2014-10-15) description, paragraphs [0025]-[0029], and figures 1-3	5-6, 8-10	Y	CN 107401870 A (HEFEI HUALING CO., LTD. et al.) 28 November 2017 (2017-11-28) description, paragraphs [0028]-[0043]	5-6, 8-10	Y	CN 105241169 A (QINGDAO HAIER CO., LTD.) 13 January 2016 (2016-01-13) description, paragraphs [0020]-[0050], and figures 1-2	1-2, 5-10	Y	CN 107388718 A (HEFEI HUALING CO., LTD. et al.) 24 November 2017 (2017-11-24) description, paragraphs [0034]-[0041]	1-2, 5-10	A	CN 205119642 U (QINGDAO HAIER CO., LTD.) 30 March 2016 (2016-03-30) entire document	1-10
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Date of the actual completion of the international search 20 February 2023	Date of mailing of the international search report 27 February 2023																				
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INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2022/136931

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Information on patent family members

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