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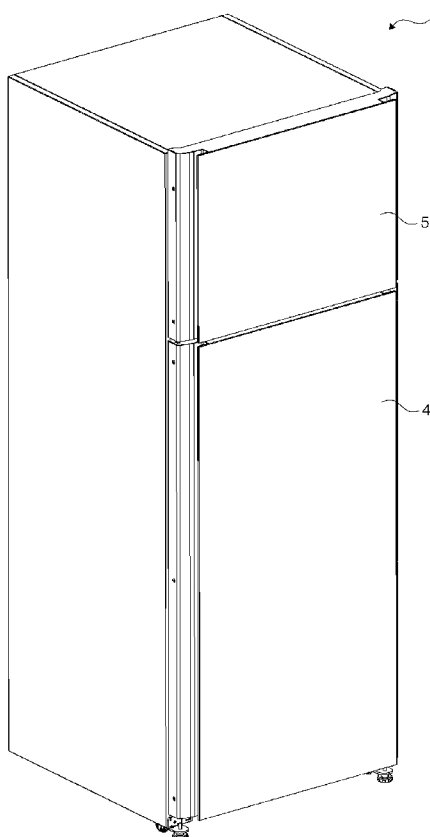
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(54) Title: A REFRIGERATOR HAVING THE FUNCTION OF THAWING FROZEN FOODS

Figure 1



(57) Abstract: The present invention relates to a refrigerator (1) that comprises a cooling compartment (2) wherein the items to be cooled are stored, a freezing compartment (3) wherein the items to be frozen are placed, a cooling compartment door (4) allowing access into the cooling compartment (2), a freezing compartment door (5) allowing access into the freezing compartment (3) and an intermediate wall (6) that separates the cooling compartment (2) from the freezing compartment (3).



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Description**A REFRIGERATOR HAVING THE FUNCTION OF THAWING FROZEN FOODS**

- [0001] The present invention relates to a refrigerator having the function of thawing the frozen foods.
- [0002] In refrigerators having freezing and cooling compartments, when some of the foodstuffs stored in the freezing compartment are desired to be consumed, first of all the food has to be taken out of the freezing compartment to be thawed and thereafter prepared for consumption. In order to perform the thawing process, inside the cooling compartment, with a higher temperature than the freezing compartment, special cabinets equipped with special heating mechanisms are provided, wherein only the thawing process is performed. The frozen foods are taken from the freezing compartment and transferred to these special cabinets in the cooling compartment when desired to be thawed. In this case, the door of the cooling compartment and the door of the freezing compartment have to be opened. Opening the doors of the cooling compartment and the freezing compartment frequently adversely affects the refrigeration performance.
- [0003] Moreover, the thawing process is a long procedure. Nowadays, in order to prevent the time loss of the user, thawing of the frozen foods by the user remotely accessing the refrigerator is an emerging need.
- [0004] In the state of the art United States of America patents no US4385075 and US5930454, a refrigerator is explained which comprises a special thawing casing.
- [0005] In the state of the art Korean Patent Application no KR100600779, a refrigerator is explained wherein the thawing process is performed by using both a heater and utilizing the heat of the fluid circulated in the refrigeration system.
- [0006] In another state of the art document, the Japanese Patent application no JP2002228154, a refrigerator capable of thawing is explained which can be controlled by a command transmitted through an internet system, a telephone and the like.
- [0007] In the state of the art, for the thawing process the frozen food should be

taken out of the freezing compartment by the user by opening the door of the freezing compartment and to be placed in the special compartment in the cooling compartment. In other words, the user should transfer the frozen foods in the freezing compartment to the cooling compartment. This affects both the refrigeration performance and also the thawing process cannot be performed in refrigerators that can be controlled by remote access methods.

[0008] The object of the present invention is to design a refrigerator wherein the frozen foodstuff can be transferred from the freezing compartment to the cooling compartment for the thawing process.

[0009] The refrigerator realized to fulfill the object of the present invention, explicated in the first claim and the respective claims thereof, comprises an "L" shaped separator fitted into the passage in the intermediate compartment. The separator comprises a first cover that closes the passage in the first position and a second cover, vertical thereto, that closes the passage when the separator is rotated 90 degrees.

[0010] Thus, the frozen foods on the first cover can be transferred into the cooling compartment for performing the thawing process at least without opening the freezing compartment door.

[0011] The refrigerator furthermore comprises a stopper whereto the first cover bears against in the first position and whereto the second cover bears against in the second position. The stopper provides leak-proofing between the cooling compartment and the freezing compartment by surrounding the passage all around when the covers bear against thereto.

[0012] In another embodiment of the present invention, the refrigerator comprises an additional compartment disposed under the passage, whereto the first cover passes with the foods placed thereon when the separator changes from the first position to the second position.

[0013] In another embodiment of the present invention, the first cover and the second cover are configured like boxes.

[0014] In another embodiment of the present invention, the separator can be directly controlled by the user by means of a motor.

[0015] In yet another embodiment of the present invention, the separator can be

controlled by the user by using remote access methods.

[0016] A refrigerator designed to fulfill the object of the present invention is illustrated in the attached claims, where:

[0017] Figure 1 – is the perspective view of a refrigerator.

[0018] Figure 2 – is the perspective view of the refrigerator when the separator is in the first position.

[0019] Figure 3 – is the perspective view of the refrigerator while the separator changes from the first position to the second position.

[0020] Figure 4 – is the perspective view of the refrigerator when the separator is in the second position.

[0021] Figure 5 – is the view of the separator and the movement mechanism.

[0022] The elements illustrated in the figures are numbered as follows:

1. Refrigerator
2. Cooling compartment
3. Freezing compartment
4. Cooling compartment door
5. Freezing compartment door
6. Intermediate wall
7. Passage
8. Separator
9. First cover
10. Second cover
11. Additional compartment
12. Opening
13. Lid
14. Movement mechanism
15. Heating mechanism
16. Pivot
17. Stopper
18. Motor
19. Actuator

[0023] The refrigerator (1) of the present invention comprises a cooling compartment (2) wherein the items to be cooled are stored, a freezing

compartment (3) wherein the items to be frozen are placed, a cooling compartment door (4) allowing access into the cooling compartment (2), a freezing compartment door (5) allowing access into the freezing compartment (3) and an intermediate wall (6) that separates the cooling compartment (2) from the freezing compartment (3).

[0024] The refrigerator (1) furthermore comprises:

- a passage (7) arranged on the intermediate wall (6) which interconnects the cooling compartment (2) with the freezing compartment (3),
- an "L" shaped separator (8) having a first cover (9), a second cover (10) vertical to the first cover (9) and a pivot (16) forming the portion where the two covers (9, 10) are joined,
- mounted to the passage (7) to be rotatable around the pivot (16),
- wherein the first position, the second cover (10) is in the freezing compartment (3) and the first cover (9) closes the passage (7),
- wherein the second position, the first cover (9) is in the cooling compartment (2) and the second cover (10) closes the passage (7).

[0025] The passage (7) is situated between the ceiling of the cooling compartment (2) and the base of the freezing compartment (3), with one end opening into the cooling compartment (2) and the other end into the freezing compartment (3).

[0026] One sides of the first and second covers (9 and 10) overlap and these overlapping sides form the pivot (16). The first cover (9) closes the passage (7) in the first position leak-proofingly and the second cover (10) in the second position thereby preventing heat exchange between the cooling compartment (2) and the freezing compartment (3). Some portion of the cooling compartment (2) ceiling is formed by the first cover (9) in the first position, and by the second cover (10) in the second position.

[0027] The refrigerator (1) comprises a hinge having a shaft that extends along the length of the pivot (16), forming the rotational axis of the separator (8) and more than one housing wherein both ends of the shaft are borne. By means of the hinge, the separator (8) is mounted to the passage (7) to be rotatable 90 degrees around the pivot (16).

[0028] The refrigerator (1) furthermore comprises a movement mechanism (14)

that enables the separator (8) to rotate 90 degrees around the pivot (16).

The movement mechanism (14) can either be directly actuated by the user or by using data lines such as internet, telephone etc. or automatically by using remote access methods.

[0029] The refrigerator (1) comprises a stopper (17) between the passage (7) and the separator (8), preferably situated all around on the passage (7), which enables the first cover (9) to bear against thereto in the first position for closing the passage (7) by the first cover (9) leak-proofingly, and the second cover (10) to bear against thereto in the second position for closing the passage (7) by the second cover (10) leak-proofingly. The stopper (17) remains between the first cover (9) and the second cover (10) while the separator (8) changes from the first position to the second position. By means of the stopper (17), both leak-proofing is maintained and also the separator (8) is prevented from automatically changing from the first position to the second position (without using the movement mechanism (14)).

[0030] In the first position, the foodstuffs to be thawed are placed on the first cover (9) of the separator (8) disposed inside the freezing compartment (3). In this case, the separator (8) remains entirely in the freezing compartment (3) and the passage (7) is closed by the first cover (9) bearing against the stopper (17) so that leak-proofing is maintained between the freezing compartment (3) and the cooling compartment (2) (Figure 2). When the movement mechanism (14) is actuated, the separator (8) rotates around the pivot (16) and while the first cover (9) passes into the cooling compartment (2) by being released from the stopper (17), at the same time the second cover (10) closes the passage (7) by bearing against the stopper (17) to provide leak-proofing between the freezing compartment (3) and the cooling compartment (2). In this case, the separator (8) has passed into the second position. Consequently, the frozen foods loaded on the first cover (9) pass into the cooling compartment (2) together with the first cover (9) (Figure 3 and Figure 4).

[0031] In an embodiment of the present invention, the first and the second covers

(9 and 10) are configured as plates.

[0032] In another embodiment of the present invention, the first cover (9) is configured like a box. The user places the food to be thawed inside the first cover (9) in the first position and when the separator (8) changes to the second position, the foodstuffs loaded into the first cover (9) pass into the cooling compartment (2). Thus, creating an additional compartment inside the cooling compartment (2), wherein the thawing process will be performed, is not required.

[0033] In another embodiment of the present invention, the second cover (10) is also configured like a box and the heights of the first and the second covers (9 and 10) are equal to the height of the passage (7) at the most. Thus, first and the second covers (9 and 10) are seated completely inside the passage (7) in the first and second positions, preventing the formation of recesses and protrusions on the base of the freezing compartment (3) or on the ceiling of the cooling compartment (2).

[0034] In another embodiment of the present invention, the refrigerator (1) comprises an additional compartment (11) disposed under the passage (7), having an opening (12) and a lid (13) closing the opening (12), wherein the first cover (9) enters in the second position of the separator (8), whereto access is provided from inside the cooling compartment (2). Consequently, the foodstuffs to be thawed can be directly transferred into the additional compartment (11) when the separator (8) changes to the second position. In this embodiment of the present invention, the refrigerator (1) comprises a heating mechanism (15) for heating the inside of the additional compartment (11). The heating mechanism (15) can either be a fan or a heater.

[0035] In another embodiment of the present invention, the movement mechanism (14) comprises a motor (18) which is activated by using remote access methods (Bluetooth, internet, wap etc.) and an actuator (19) which is activated by the motor (18). The separator (8) thus can change from the first position to the second position automatically.

[0036] In another embodiment of the present invention, the refrigerator (1) comprises a button disposed on the refrigerator (1) which enables the user

to actuate the movement mechanism (14) directly. When the button is pressed by the user, the movement mechanism (14) is actuated and the separator (8) changes from the first position to the second position.

- [0037] In another embodiment of the present invention, the refrigerator (1) comprises a display which shows the user whether the thawing process is still being performed or completed. The user is warned audibly or visually by the display as long as the thawing process continues and/or when the thawing process is completed.
- [0038] By means of the present invention, the foodstuffs frozen in the freezing compartment (3) can be transferred into the cooling compartment (2) without the requirement of opening the freezing and cooling compartment doors (5 and 4). Consequently, the lowering of the refrigeration performance resulting from opening and closing the freezing and cooling compartment doors (5 and 4) is prevented. Moreover, in refrigerators (1) controlled by remote access methods, the user does not have to actually take the frozen food out of the freezing compartment (3) and transfer into the cooling compartment (2).
- [0039] It is to be understood that the present invention is not limited by the embodiments disclosed above and an expert in the technique can easily introduce different embodiments. These should be considered within the scope of the protection postulated by the claims of the present invention.

Claims

1. A refrigerator (1) that comprises a cooling compartment (2) wherein the items to be cooled are stored, a freezing compartment (3) wherein the items to be frozen are placed, a cooling compartment door (4) allowing access into the cooling compartment (2), a freezing compartment door (5) allowing access into the freezing compartment (3) and an intermediate wall (6) that separates the cooling compartment (2) from the freezing compartment (3), **and characterized by**
 - a passage (7) arranged on the intermediate wall (6) which interconnects the cooling compartment (2) with the freezing compartment (3),
 - an "L" shaped separator (8) having a first cover (9) and a second cover (10) vertical to the first cover (9) and a pivot (16) forming the portion where the two covers (9, 10) are joined,
 - mounted to the passage (7) to be rotatable around the pivot (16),
 - wherein the first position, the second cover (10) is in the freezing compartment (3) and the first cover (9) closes the passage (7),
 - wherein the second position, the first cover (9) is in the cooling compartment (2) and the second cover (10) closes the passage (7).
2. A refrigerator (1) as in Claim 1, **characterized by** a hinge comprising a shaft extending along the length of the pivot (16) and forming the rotational axis of the separator (8) and more than one housing wherein both ends of the shaft are borne.
3. A refrigerator (1) as in Claim 1 or 2, **characterized by** a movement mechanism (14) that enables the separator (8) to rotate 90 degrees around the pivot (16).
4. A refrigerator (1) as in Claim 3, **characterized by** a movement mechanism (14) that is directly actuated by the user.
5. A refrigerator (1) as in any one of the Claims 1 to 3, **characterized by** a movement mechanism (14) that is actuated by using remote access methods.
6. A refrigerator (1) as in any one of the above Claims, **characterized by** a stopper (17) situated all around between the passage (7) and the separator (8), whereto the first cover (9) bears against in the first position and the second cover (10) bears against in the second position.
7. A refrigerator (1) as in any one of the above Claims, **characterized by** first and

second covers (9 and 10) being configured as plates.

8. A refrigerator (1) as in any one of the above Claims, **characterized by** a first cover (9) configured like a box.
9. A refrigerator (1) as in any one of the above Claims, **characterized by** a second cover (10) configured like a box.
10. A refrigerator (1) as in Claim 8 or 9, **characterized by** first and second covers (9 and 10) the height of which equals at the most to the height of the passage (7).
11. A refrigerator (1) as in any one of the above Claims, **characterized by** an additional compartment (11) disposed under the passage (7), having an opening (12) and a lid (13) closing the opening (12), wherein the first cover (9) enters in the second position of the separator (8) and whereto access is provided from inside the cooling compartment (2).
12. A refrigerator (1) as in Claim 11, **characterized by** a heating mechanism (15) for heating the inside of the additional compartment (11).
13. A refrigerator (1) as in any one of the above Claims, **characterized by** a button disposed on the refrigerator (1) which enables the user to actuate the movement mechanism (14) directly.
14. A refrigerator (1) as in any one of the above Claims, **characterized by** a display which shows the user whether the thawing process is still being performed or completed.

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Figure 1

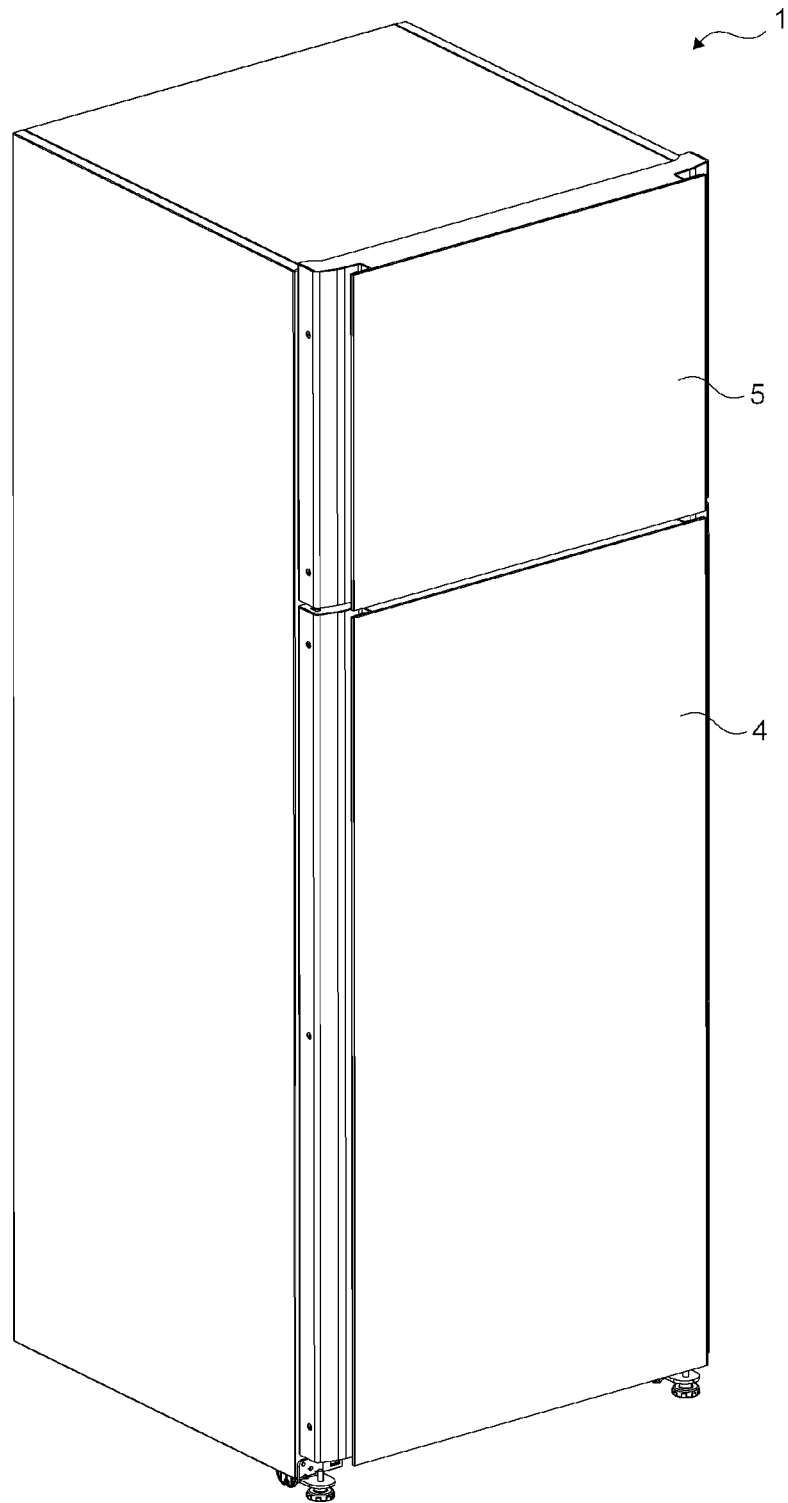


Figure 2

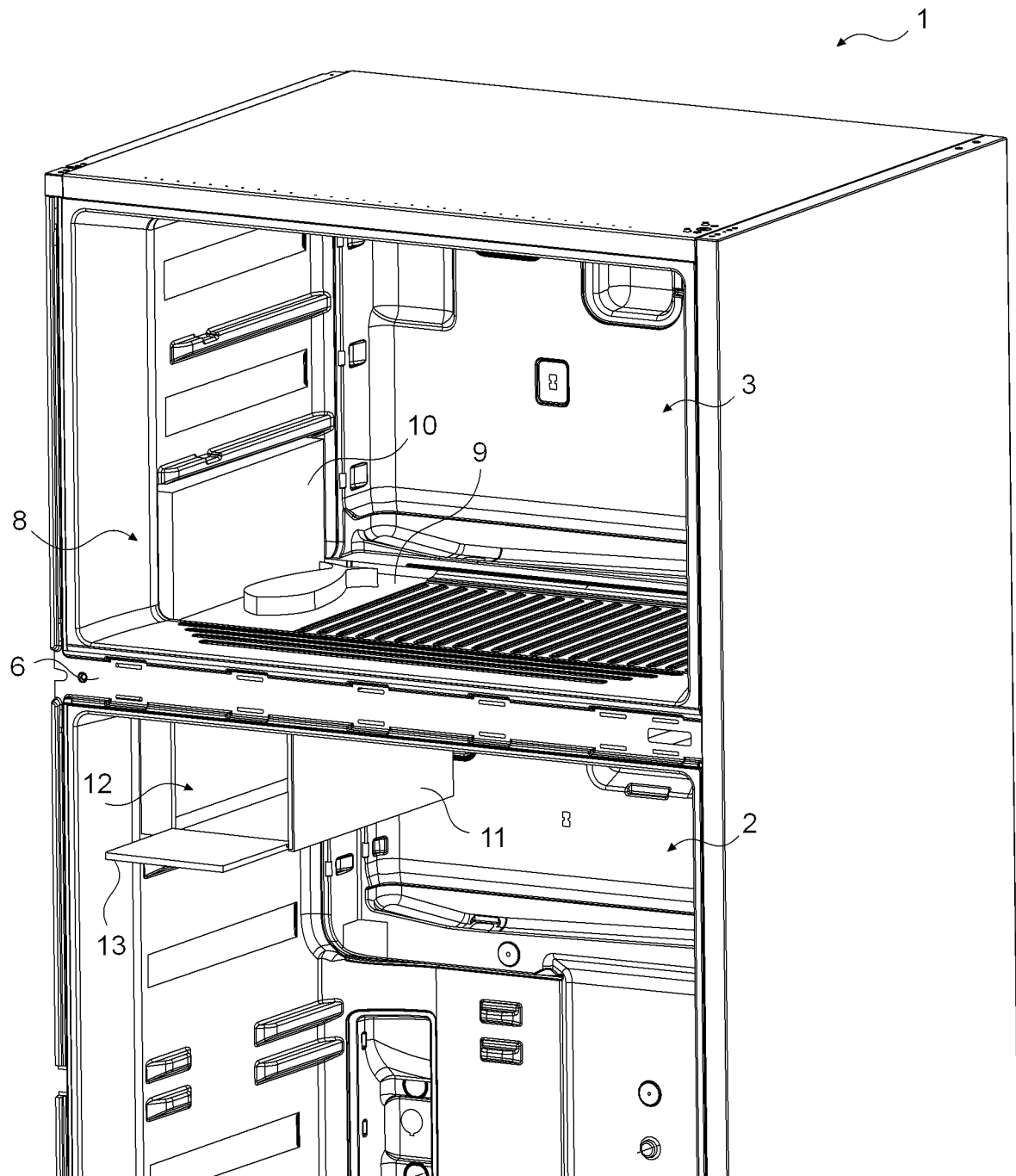


Figure 3

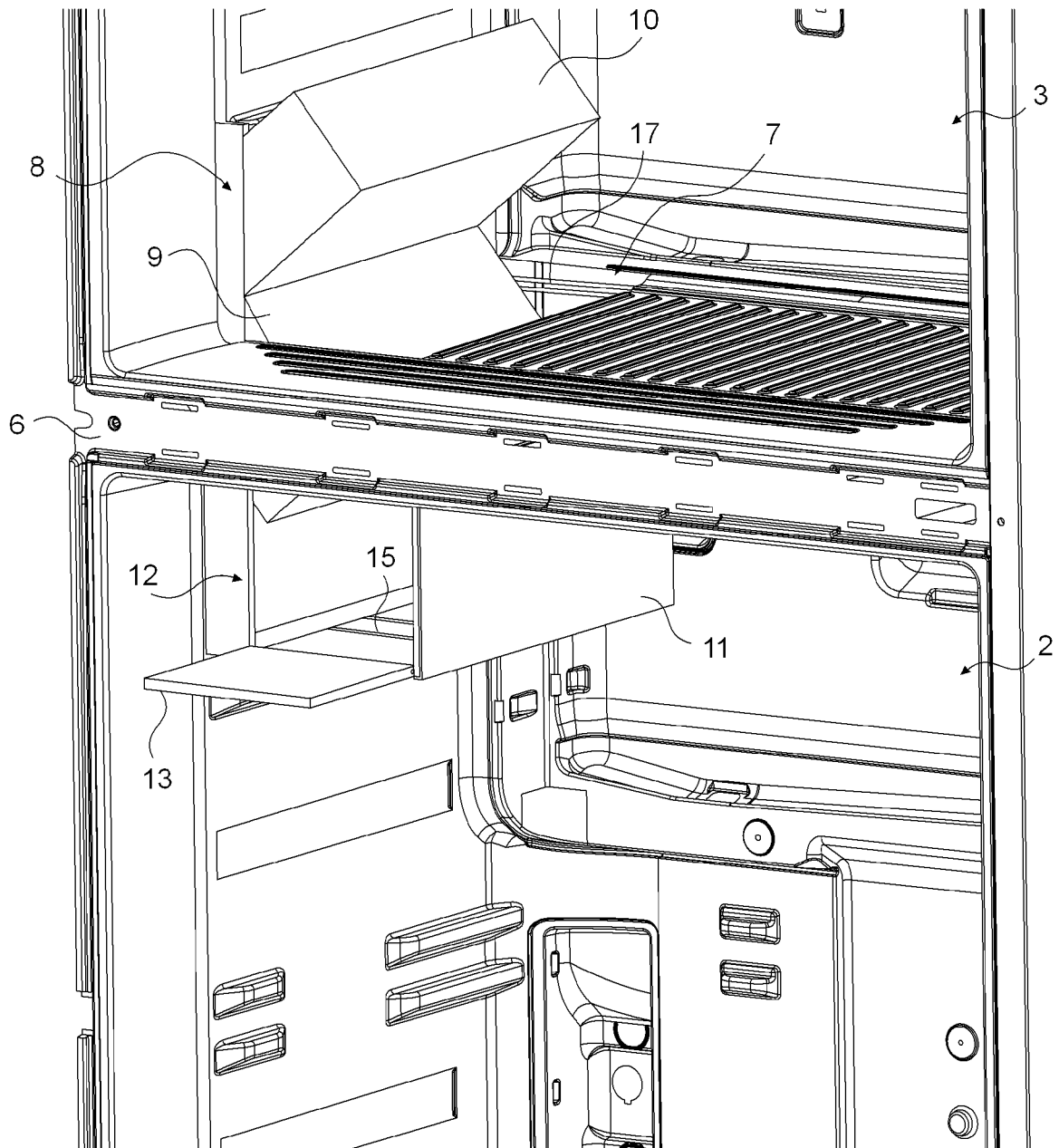


Figure 4

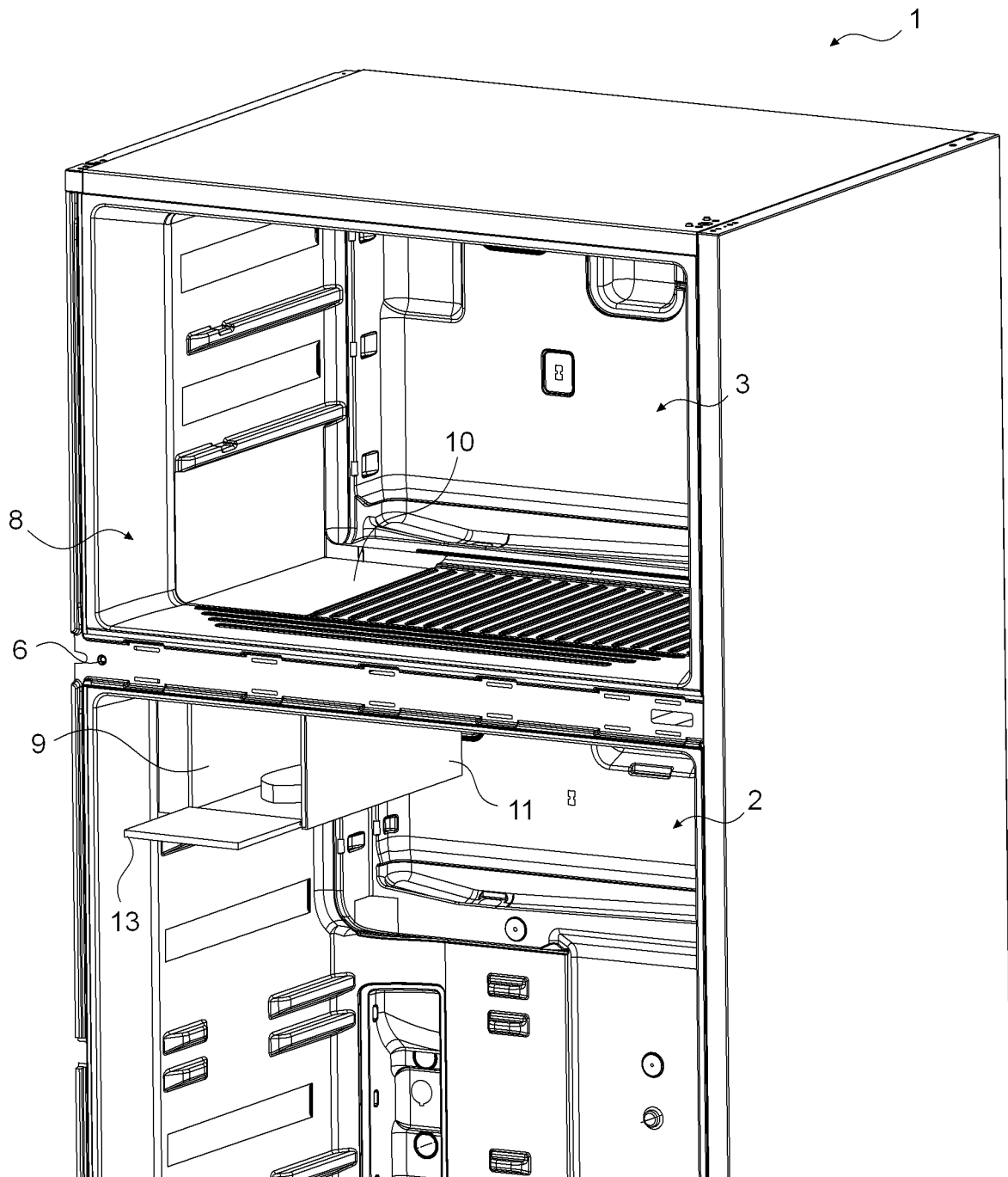


Figure 5

