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(71) Applicant: **LG ELECTRONICS INC.**
Yeongdeungpo-gu
Seoul 150-721 (KR)

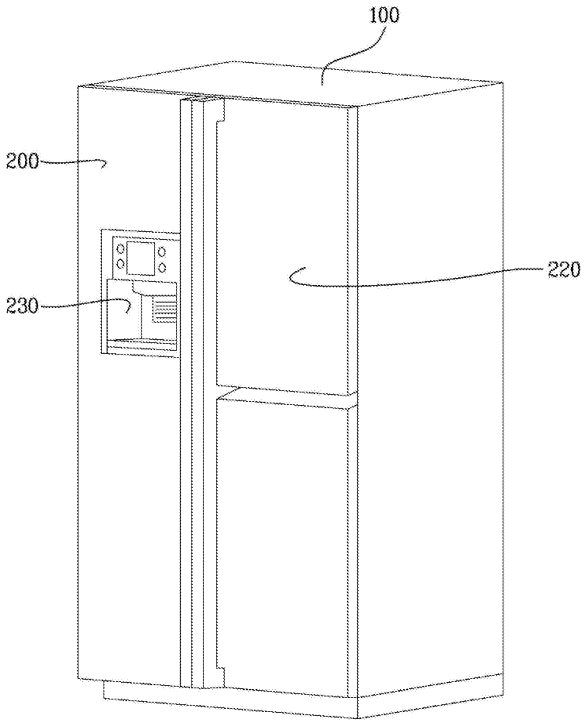
(72) Inventor: **Gwak, Younghoon**
641-711 Gyeongnam (KR)

(74) Representative: **Neobard, William John et al**
Kilburn & Strode LLP
20 Red Lion Street
London WC1R 4PJ (GB)

(54) Refrigerator

(57) A refrigerator is disclosed. The refrigerator includes a cabinet comprising a storage compartment; a door rotatably provided in the cabinet, the door opening/closing the storage compartment; an subsidiary storage compartment provided in the door, with an open rear surface; and an opening/closing device provided in a rear surface of the door to open and close the rear surface of the subsidiary storage compartment. The opening/closing device includes a supporting member coupled to the subsidiary storage compartment; and a blocking member wound around the supporting member in a roll type.

【Fig. 1】



EP 2 410 269 A2

Description

[0001] The present invention relates to the field of refrigeration. Embodiments relate to a refrigerator, and more particularly, to a refrigerator which includes a subsidiary storage compartment with an improved accessibility to improve user convenience and which can prevent leakage of cold air provided in the refrigerator.

[0002] A refrigerator, also sometimes referred to as a refrigerator-freezer, or "fridge freezer" is an electric appliance which can maintain freshness of various foods or other products for a long time by supplying cold air generated by a freezing cycle to a freezer compartment and a refrigerator compartment.

[0003] In general, such a refrigerator includes a cabinet having a freezer compartment and a refrigerator compartment formed therein to store foods, and doors coupled to sides of the cabinet to open and close the freezer and compartment compartments, respectively. Elements including a compressor, an evaporator, an expansion valve and the like which compose the freezing cycle may be provided in the cabinet. Cold air generated from the evaporator is supplied to the freezer and refrigerator compartments, to preserve stored food in the freezer and refrigerator compartments at a low temperature for a long time period.

[0004] In the meanwhile, demands for an enlarged and luxurious refrigerator have been increasing recently because of improvement of a life environment. As a result, there has been a growing prevalence of the use of side by side type refrigerators which have a large capacity of a storage compartment and of which an internal space of the storage compartment is partitioned off into right and left parts, in other words, freezer and refrigerator compartments.

[0005] The side by side type refrigerator has a disadvantage of much power consumption because of the enlarged storage compartment. Because of that, a subsidiary storage compartment is installed in a predetermined portion of the storage compartment, in other words, a door of the refrigerator compartment and simple foods such as beverages are stored in the subsidiary storage compartment. When the foods are taken out of the subsidiary storage compartment, only a door of the subsidiary storage compartment is open simply, not a door of the refrigerator compartment. There may be active development on the refrigerator including such the subsidiary storage compartment.

[0006] An opening/closing device is provided in a rear surface of the subsidiary storage compartment, in other words, a surface of the subsidiary storage compartment toward the inside of the refrigerator. The opening/closing device covers the rear surface of the subsidiary storage compartment and leakage of cold air inside the refrigerator is prevented when only the door of the subsidiary storage compartment is open.

[0007] However, the opening/closing device configured to open/close the rear surface of the subsidiary storage compartment may be rotatable upward/downward and rightward/leftward. In case a user opens the inside of the refrigerator compartment by rotating the door of the refrigerator compartment a predetermined angle or more, the user cannot rotate the opening/closing device smoothly to open and close the subsidiary storage compartment.

[0008] In addition, when the inside of the refrigerator compartment is open by rotating the entire door of the refrigerator compartment a predetermined angle or more to open and close the rear surface of the subsidiary storage compartment, cold air supplied to the inside of the refrigerator compartment might be leaked outside and a disadvantage of electric power waste might occur.

[0009] Embodiments provide a refrigerator which includes an opening/closing device configured to open and close a rear surface of an subsidiary storage compartment in a roll type, to open and close the rear surface of the subsidiary storage compartment, even if an entire door of a refrigerator compartment is not rotated a predetermined angle or more, and to improve accessibility for a user and to prevent waste of consumed power.

[0010] In one aspect, a refrigerator includes a cabinet comprising a storage compartment; a door rotatably provided in the cabinet, the door opening/closing the storage compartment; an subsidiary storage compartment provided in the door, with an open rear surface; and an opening/closing device provided in a rear surface of the door to open and close the rear surface of the subsidiary storage compartment, wherein the opening/closing device includes a supporting member coupled to the subsidiary storage compartment; and a blocking member wound around the supporting member in a roll type.

[0011] Embodiments have the following advantages:

[0012] The opening/closing device configured to open and close the rear surface of the subsidiary storage compartment provided in the refrigerator compartment door may be provided as winding roll type. As a result, the user may open and close the rear surface of the subsidiary storage compartment even without opening the refrigerator compartment by rotating the entire refrigerator compartment door. Because of that, the accessibility to the subsidiary storage compartment may be improved and leakage of the cold air supplied to the refrigerator compartment may be prevented to prevent the waste of consumed power.

[0013] In the drawings:

[0014] FIG. 1 is a perspective view illustrating a refrigerator;

[0015] FIG. 2 is a perspective view illustrating an open state of an subsidiary storage compartment door provided in the refrigerator;

[0016] FIG. 3 is a perspective view illustrating an open state of a refrigerator compartment door provided in the refrigerator;

[0017] FIG. 4 is a front view illustrating an opening/closing device;

[0018] FIG. 5 is a side view illustrating the opening/

closing device of FIG. 4;

[0019] FIG. 6 is a front view illustrating another opening/closing device;

[0020] FIG. 7 is a side view illustrating the opening/closing device of FIG. 6;

[0021] FIG. 8 is a front view illustrating yet another opening/closing device;

[0022] FIG. 9 is a side view illustrating the opening/closing device of FIG. 8; and

[0023] FIGS. 10 and 11 are perspective views illustrating an operation process of the opening/closing device of FIG. 4.

[0024] In reference to FIG. 1, a basic structure of the refrigerator will be described in detail.

[0025] As shown in FIG. 1, an exterior appearance of the refrigerator is defined by a cabinet 100 formed in an approximately cube shape.

[0026] A storage compartment (110, see FIG. 3) which is a room for storing foods and the like is formed in the cabinet 100. The storage compartment 110 is partitioned into right and left parts by a barrier (not shown) provided in the cabinet 100, such that freezer and refrigerator compartments may be provided.

[0027] According to the type of refrigerator, the barrier may partition the storage compartment 110 of the cabinet 100 into top and bottom parts to provide the freezer and refrigerator compartments. The present invention may be applicable to various types of refrigerators, not limited thereby.

[0028] The front of the cabinet 100 is formed open and doors 200 are rotatably coupled to the open front of the cabinet 100. The doors 200 are configured to open and close the open front of the cabinet 100, in other words, the freezer and refrigerator compartments selectively.

[0029] The door 200 may be configured to open and close the freezer and refrigerator compartments and they may open and close the freezer and refrigerator compartments independently by rotating along both directions.

[0030] In the meanwhile, a dispenser 200 is provided in a door 200 opening and closing the freezer compartment to allow a user to dispense purified water or ice outside.

[0031] FIG. 2 is a perspective view illustrating an open state of a subsidiary storage compartment door 220 provided in the refrigerator. In reference to FIG. 2, an operation process of the subsidiary storage compartment door 220 will be described in detail.

[0032] First of all, a subsidiary storage compartment 210 is installed in the refrigerator compartment door 200 of the refrigerator. When taking out simple stored foods such as beverages, the user can open only the subsidiary storage compartment door 220 simply to take the stored foods out, not open the entire refrigerator compartment door 200.

[0033] In addition, as shown in FIG. 2, the subsidiary storage compartment door 220 is provided in a front surface of the door 200 configured to open and close the refrigerator compartment. The subsidiary storage compartment door 220 allows the user to take or place the stored foods out of or in the cabinet 100, without opening the door 200. The subsidiary storage compartment door 220 may allows the foods to be taken out of a storage room provided in the refrigerator compartment inside the cabinet 100 or in a rear surface of the door 200.

[0034] The subsidiary storage compartment door 220 may be rotatably coupled to the front surface of the door 200 and it is rotated with respect to a side of the refrigerator compartment along a predetermined direction, to open an opening 202 provided in the door 200.

[0035] In other words, a hinge shaft (not shown) is provided in a side of the subsidiary storage compartment door 220 to be coupled to the front surface of the door 200. The subsidiary storage compartment door 220 is rotated about the hinge shaft to open the opening 202.

[0036] The opening 202 is in communication with the subsidiary storage compartment 210 provided in the door 200. Because of that, the user may open only the subsidiary storage compartment door 220 and he or she may store or take out the foods such as beverages in or from the subsidiary storage compartment 210.

[0037] That is, the user may open only the subsidiary storage compartment door 220 such that he or she may store or take out the stored foods with high use frequency smoothly. The leakage of the cold air outside the refrigerator, which is generated when the entire door 200 is opened, may be reduced and power waste may be prevented.

[0038] In addition, the subsidiary storage compartment door 220 is typically provided in the door 200 configured to open and close the refrigerator compartment. However, in case the dispenser 230 is not provided, the subsidiary storage compartment door 220 may be provided in the door 200 configured to open and close the freezer compartment. If necessary, it may be provided each of the doors for freezer and refrigerator compartments.

[0039] FIG. 3 is a perspective view illustrating an open state of the refrigerator compartment door 200 provided in the refrigerator. In reference to FIG. 3 will be described in detail the structures of the subsidiary storage compartment 210 and an opening/closing device 300 provided in the subsidiary storage compartment 210.

[0040] In reference to FIG. 3, the front surface of the refrigerator compartment is open to the outside of the refrigerator when the door 200 rotatably coupled to the refrigerator compartment is open.

[0041] In other words, when trying to store or take the foods in or out of the refrigerator compartment, the user may rotate the door 200 to open refrigerator compartment. In this case, the subsidiary storage compartment door 220 provided in the front surface of the door 200 is rotated together with the door 200, in a state of being attached to the door 200.

[0042] In the meanwhile, the user may store foods in the subsidiary storage compartment 210 provided in the rear surface of the door 200 as well as in the refrigerator

compartment.

[0043] That is, the subsidiary storage compartment 210 may be opened by rotating only the subsidiary storage compartment door 220 from the outside of the refrigerator or by rotating the door 200 in a state of the subsidiary storage compartment door 220 being attached thereto.

[0044] Such the subsidiary storage compartment 210 includes a partition wall (212, see FIG. 5) and at least one shelf 214 provided in the partition wall (212, see FIG. 5). The partition wall 212 defines a predetermined room where the foods are stored and the shelf 214 is provided in the internal room formed by the partition wall 212 to support the foods.

[0045] A rear surface of the subsidiary storage compartment 210 is open to store the foods and an opening/closing device 300 is provided in the rear surface of the subsidiary storage compartment 210 to open and close the open rear surface of the subsidiary storage compartment 210.

[0046] When the subsidiary storage compartment 210 is opened by rotating only the subsidiary storage compartment door 220 outside the refrigerator, the opening/closing device 300 may prevent the cold air inside the refrigerator compartment from being leaked outside after moved to the subsidiary storage compartment 210.

[0047] When the refrigerator compartment is opened toward the outside of the refrigerator by rotation of the door 200, the user may open and close the opening/closing device 300 provided in the rear surface of the subsidiary storage compartment 210 such that he or she may store or take foods in or out of the subsidiary storage compartment 210.

[0048] Such the opening/closing device 300 includes a supporting member 310 rotatably coupled to a top of the subsidiary storage compartment 210 and a blocking member 320 wound around the supporting member 310.

[0049] Specifically, the supporting member 310 formed in a pole shape is rotatably coupled to the top of the subsidiary storage compartment 210. The blocking member 320 wound around the supporting member 310 is a roll type and it covers a predetermined area of the rear surface of the subsidiary storage compartment 210.

[0050] As a result, the user moves the blocking member 320 upwardly and downwardly in a state of being wound around the supporting member 310, even if not rotating the door 200 a predetermined angle or more, such that the subsidiary storage compartment 210 may be selectively opened or closed and that accessibility to the subsidiary storage compartment 210 for the user may be improved.

[0051] In the meanwhile, a plurality of slits 322 may be formed in the blocking member 320, spaced apart a predetermined distance from each other. When the door 200 is closed, the cold air supplied to the refrigerator compartment may be drawn into the subsidiary storage compartment 210 via the slits 322.

[0052] Because of that, the size and the number of the slits 322 may be adjusted based on the sizes of the rooms partitioned by the shelf 214 of the subsidiary storage compartment 210.

[0053] Also, the blocking member 320 may be formed of a synthetic water-proof fabric. In other words, the blocking member 320 is formed of synthetic resin water-proof fabric woven of plastic lines having a single side or both sides water-proof-treated. Because of that, damage to the blocking member 320 generated by moistures penetrated thereto may be prevented even if dewdrops or frosts are generated by the cold air inside the refrigerator compartment.

[0054] FIG. 4 is a front view illustrating the opening/closing device 300. FIG. 5 is a side view illustrating the opening/closing device 300. In reference to FIGS. 4 and 5, the structure of the opening/closing device 300 will be described in detail.

[0055] As mentioned above, the opening/closing device 300 provided in the rear surface of the door 200 to open and close the subsidiary storage compartment 210 may include the supporting member 310 and the blocking member 320. The opening/closing device 300 may further include a fixing member 330 provided in an end of the blocking member 320.

[0056] In other words, the fixing member 330 may be fixed to a predetermined portion of the subsidiary storage compartment 210 to cover and fix a predetermined area of the rear surface possessed by the subsidiary storage compartment 210.

[0057] The supporting member 310 includes a housing 311, a supporting pole 312 having the blocking member 320 wound there around, and an elastic supporting member 313 configured to supporting both ends of the supporting pole 312 elastically.

[0058] When the blocking member 320 is wound around an outer surface of the supporting pole 312, the elastic supporting member 313 pulls the supporting pole 312 along a predetermined rotational direction. This rotational direction is a direction in which the blocking member 320 is wound around the supporting pole 312.

[0059] As a result, when the pulling force is applied to the blocking member 320, the blocking member 320 is wound around the supporting pole 312 by the elastic member 313.

[0060] If the fixing member 330 is fixed to a predetermined portion of the subsidiary storage compartment 210 after the user pulls the fixing member 330 or the blocking member 320 downwardly, the blocking member 320 is pulled tightly by the elastic force of the elastic supporting member 313.

[0061] In this state, the fixing state of the fixing member 330 is released and the pulling state of the blocking member 320 is released. If then, the supporting pole 312 is rotated along a predetermined rotational direction by the rotational restitution force of the elastic supporting member 313 and the blocking member 320 is pulled upward accordingly, to be caught up in the supporting member 310.

[0062] Here, a torsion spring may be provided in the elastic supporting member 313.

[0063] As shown in FIG. 4, the fixing member 330 according to this embodiment of the present invention includes a ring 332 configured to fix the blocking member 320 to a predetermined position of the rear surface of the subsidiary storage compartment 210.

[0064] In other words, in reference to FIG. 5, a plurality of projections 214a may be provided in a front surface of the shelf 214 along a longitudinal direction of the shelf 214 at a proper distance. The projections 214a may be projected a predetermined length backwardly.

[0065] The ring 332 is hooked to the projection 214a such that the blocking member 320 may be fixed to the predetermined position of the rear surface of the subsidiary storage compartment 210.

[0066] Also, the projections 214 may be provided in at least one shelf 214. The user inserts the ring 332 in the projection 214a provided in each shelf 214 selectively such that the user may adjust the area of the rear surface of the subsidiary storage compartment 210 covered by the blocking member 320.

[0067] In other words, the blocking member 320 may cover an entire area and a predetermined area of the rear surface of the subsidiary storage compartment and it may open an entire area of the rear surface of the subsidiary storage compartment 210.

[0068] When the door 200 is rotated to open the front surface of the refrigerator compartment, the user releases the connection between the ring 332 and the projection 214a and he or she winds the blocking member 320 around the supporting member 310, only to open the rear surface of the subsidiary storage compartment 210.

[0069] FIG. 6 is a front view illustrating an opening/closing device. FIG. 7 is a side view illustrating the opening/closing device 300. In reference to FIGS. 6 and 7, the structure of the opening/closing device 300 will be described in detail. The same configurations as those of the opening/closing device 300 of the embodiment described above will not be described.

[0070] As shown in FIG. 6, a fixing member 330 according to this embodiment may include a fixing pole 334 to fix the blocking member 320 to a predetermined position of the rear surface of the subsidiary storage compartment 210.

[0071] That is, in reference to FIG. 7, a plurality of hooking grooves 212a may be provided along a longitudinal direction of the partition wall 212 at a proper distance. The fixing pole 334 is inserted in the hooking groove 212a to fix the blocking member 320 to a predetermined position of the rear surface of the subsidiary storage compartment 210.

[0072] The hooking groove 212 is provided a side surface of the at least one shelf 214 along the longitudinal direction of the partition wall 212. The user may insert the fixing pole 334 in the hooking groove 212a provided in the side surface of each shelf 214 such that he or she may adjust the area of the rear surface of the subsidiary storage compartment 210 covered by the blocking member 320.

[0073] In other words, the blocking member 320 may cover an entire area and a predetermined area of the rear surface possessed by the subsidiary storage compartment 210 or it may open the entire area of the rear surface possessed by the subsidiary storage compartment 210.

[0074] In the meanwhile, when he or she opens the front surface of the refrigerator compartment by rotating the door 200, the user releases the connection between the fixing pole 334 and the groove 212a and winds the blocking member 320 around the supporting member 310, only to open the rear surface of the subsidiary storage compartment 210.

[0075] FIG. 8 is a front view illustrating an opening/closing device 300 and FIG. 9 is a side view illustrating the opening/closing device 300. In reference to FIGS. 8 and 9, the structure of the opening/closing device 300 of this embodiment will be described in detail. The same configurations as the embodiment described above in reference to FIGS. 4 and 5 will be omitted.

[0076] As shown in FIG. 8, a fixing member 330 according to this embodiment may include a magnet 336 configured to fix the blocking member 320 to a predetermined position of the rear surface of the subsidiary storage compartment 210.

[0077] In reference to FIG. 9, a steel surface 214b formed of steel is provided in the shelf 214 along a longitudinal direction of the shelf 214. The magnet 336 is attached to the steel surface 214b and the blocking member 320 is located at a predetermined position of the rear surface of the subsidiary storage compartment 210.

[0078] The steel surface 214b is provided in the front surface of the at least one shelf 214. Because of that, the user may attach the magnet 336 to the steel surface 214b provided in the front surface of each shelf 214 selectively such that he or she may adjust the area of the rear surface of the subsidiary storage compartment 210 covered by the blocking member 320.

[0079] When opening the front surface of the refrigerator compartment by rotating the door 200, the user may release the connection between the magnet and the steel surface 214b and he or she may wind the blocking member 320 around the supporting member 310, to open the rear surface of the subsidiary storage compartment 210.

[0080] FIGS. 10 and 11 are perspective views illustrating the operation process of the opening/closing device 300 of the first embodiment described above. In reference to FIGS. 10 and 11, the operation process of the opening/closing device 300 according to the first embodiment described above will be described in detail.

[0081] As shown in FIG. 10, the user opens the door 200 to open the front surface of the refrigerator compartment toward the outside of the refrigerator. In this case, the rear surface of the subsidiary storage compartment 210 provided in the door 200 may be exposed outside.

[0082] The opening/closing device 300 configured to

open and close the subsidiary storage compartment 210 is provided in the rear surface of the door 200. The opening/closing device 300 covers the predetermined area of the rear surface of the subsidiary storage compartment. Because of that, the cold air supplied to the inside of the subsidiary storage compartment may be prevented from being leaked outside the refrigerator.

[0083] In addition, the ring 332 which is the fixing member 330 of the opening/closing device 300 is insertedly connected to the projection 214a formed in the at least one shelf 214 provided along the partition wall 212 of the subsidiary storage compartment 210. Because of that, the blocking member 320 of the opening/closing device 300 may be fixed to the predetermined position of the rear surface of the subsidiary storage compartment 210.

[0084] As shown in FIG. 11, when trying to store or take foods in or out of the subsidiary storage compartment 210 in the state of opening the refrigerator by rotating the door 200, the user may wind the blocking member 320 around the supporting member of the opening/closing device 300 and he or she may open the rear surface of the subsidiary storage compartment 210.

[0085] Also, the user may insertedly connect the ring 332 which is the fixing member 330 to the projection 214a provided in the top of the subsidiary storage compartment 210, in the state of winding the blocking member 320 around the supporting member 310. Because of that, the blocking member 320 may be fixed to maintain a position at which the subsidiary storage compartment 210 is open.

[0086] In addition, the elastic member (not shown) is provided at the area where the supporting member 310 is connected with the subsidiary storage compartment 210. When the blocking member 320 is wound around the supporting member 310, the winding is automatically performed by the elastic force of the elastic member as soon as the connection between the ring 332 and the projection 214a is released.

[0087] That is, the opening/closing device 300 provided in the rear surface of the subsidiary storage compartment 210 has the roll type winding structure to open and close the subsidiary storage compartment 210. Because of that, the user may open and close the rear surface of the subsidiary storage compartment 210 even if not opening the refrigerator compartment by rotating the entire refrigerator compartment door 200 a predetermined angle or more.

[0088] As a result, when opening the front surface of the refrigerator compartment by rotating the entire door 200, the user's accessibility to the subsidiary storage compartment 210 may be improved advantageously and the leakage of the cold air supplied to the refrigerator compartment may be prevented to prevent waste of the consumed power advantageously.

[0089] In the meanwhile, operation processes of the opening/closing device 300 of other embodiments of the present invention may be identical to the operation process of the opening/closing device 300 of the first embodiment of the present invention described above.

[0090] 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 scope of the inventions. Thus, it is intended that the present disclosure covers modifications and variations provided they come within the scope of the appended claims.

Claims

1. A refrigerator comprising:

   a cabinet comprising a storage compartment;
   a door rotatably provided in the cabinet, the door opening/closing the storage compartment;
   a subsidiary storage compartment provided in the door, with an open rear surface; and
   an opening/closing device provided in a rear surface of the door to open and close the rear surface of the subsidiary storage compartment,
   wherein the opening/closing device comprises,
   a supporting member coupled to the subsidiary storage compartment; and
   a blocking member wound around the supporting member in a roll type.

2. The refrigerator as claimed in claim 1, wherein the opening/closing device further comprises a fixing member provided at an end of the blocking member, the fixing member fixed to a predetermined position of the subsidiary storage compartment, and
   the blocking member and the fixing member are movable upwardly and downwardly, to open or close the rear surface of the subsidiary storage compartment selectively.

3. The refrigerator as claimed in claim 2, wherein plurality of the fixing members are selectively fixed to a plurality of positions provided in the rear surface of the subsidiary storage compartment, to adjust a degree of the opening and closing of the rear surface of the subsidiary storage compartment which is performed by the blocking member.

4. The refrigerator as claimed in claim 1, wherein at least one slit is provided in the blocking member to make the storage compartment in communication with the subsidiary storage compartment.

5. The refrigerator as claimed in claim 1, wherein the blocking member is formed of water-proof synthetic resin fabric woven of plastic lines, with a single or both surfaces being water-proof-treated.

6. The refrigerator as claimed in claim 2, wherein the subsidiary storage compartment comprises,
   a partition wall configured to define a predetermined

room where foods are stored;
at least one shelf provided in the partition wall to support the stored foods, and
a plurality of projections are provided in the shelf, spaced apart a predetermined distance from each other, and the projections are projected backwardly, and
the fixing member comprises a ring which is able to be caught up in the projections to fix the blocking member to a predetermined position of the subsidiary storage compartment.

7. The refrigerator as claimed in claim 2, wherein the subsidiary storage compartment comprises,
a partition wall configured to define a predetermined room where foods are stored; and
at least one shelf provided in the partition wall to support the stored foods, and
a plurality of hooking grooves are provided in the partition, spaced apart a predetermined distance from each other, and
the fixing member comprises a fixing pole which is able to be inserted in the hooking grooves to fix the blocking member to a predetermined position of the subsidiary storage compartment.

8. The refrigerator as claimed in claim 2, wherein the subsidiary storage compartment comprises,
a partition wall configured to define a predetermined room where foods are stored; and
at least one shelf provided in the partition wall to support the stored foods, and
a steel surface formed of steel is provided in the shelf, and
the fixing member comprises a magnet which is able to be attached to the steel surface to fix the blocking member to a predetermined position of the subsidiary storage compartment.

9. The refrigerator as claimed in claim 1, wherein the supporting member comprises, a housing;
a supporting pole provided in the housing, the supporting pole where the blocking member is wound; and
an elastic supporting member provided in both ends of the supporting pole to support the supporting pole elastically.

10. The refrigerator as claimed in claim 9, wherein the elastic supporting member supports the supporting pole by using a rotational restitution force, for the supporting pole to rotate along a winding direction of the blocking member.

11. A refrigerator comprising:

a cabinet comprising a storage compartment;
a door rotatably coupled to the cabinet, the door configured to open and close the storage compartment;
a subsidiary storage compartment provided in the door, with an open rear surface to place foods or take out the foods there through; and
an opening/closing device provided in the rear surface of the subsidiary storage compartment, to open and close the rear surface of the subsidiary storage compartment,
wherein the opening/closing device comprises,
a blocking member configured to open and close the open rear surface of the subsidiary storage compartment, the blocking member which is able to adjust a degree of the opening and closing; and
a supporting member having the blocking member wound there around in a roll type, to support the blocking member by using a rotational restitution force.

12. The refrigerator as claimed in claim 11, wherein the supporting member comprises,
a housing;
a supporting pole provided in the housing, having the blocking member wound there around; and
an elastic supporting member provided in both ends of the supporting pole to support the supporting pole elastically.

13. The refrigerator as claimed in claim 11, wherein the elastic supporting member supports the supporting pole by using a rotational restitution force for the supporting pole to rotate along a winding direction of the blocking member.

14. The refrigerator as claimed in claim 11, wherein the opening/closing device further comprises a fixing member provided in an end of the blocking member to be fixed to a predetermined position of the subsidiary storage compartment, and
the blocking member and the fixing member are movable upwardly and downwardly to open and close the open rear surface of the subsidiary storage compartment selectively.

15. The refrigerator as claimed in claim 14, wherein the fixing member is able to be selectively fixed to a plurality of positions provided in the rear surface of the subsidiary storage compartment, to adjust a degree of the opening and closing of the rear surface of the subsidiary storage compartment.

16. The refrigerator as claimed in claim 11, wherein at least one slit is provided in the blocking member to make the storage compartment in communication with the subsidiary storage compartment.

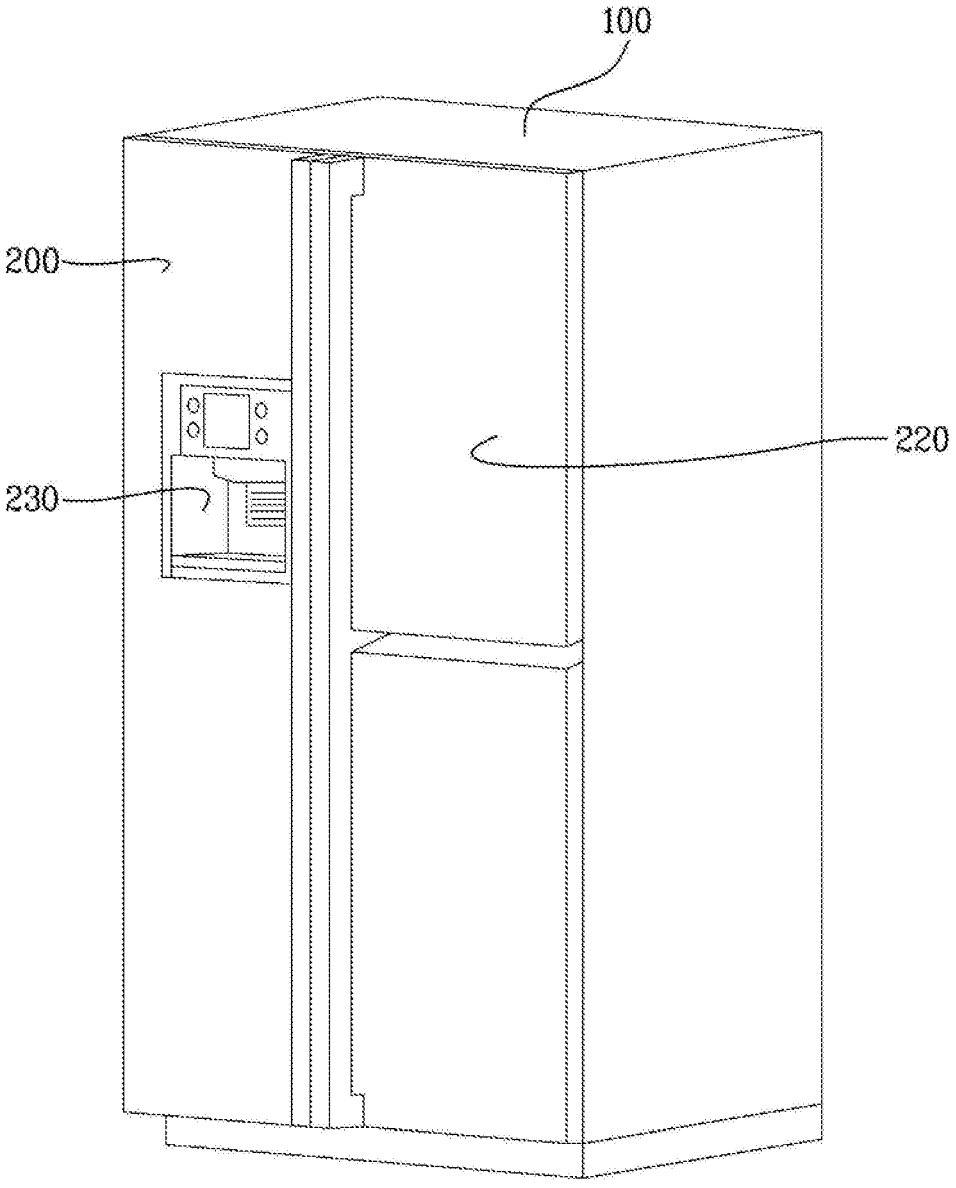
17. The refrigerator as claimed in claim 14, wherein the

subsidiary storage compartment comprises,
a partition wall configured to define a predetermined room where foods are stored; and
at least one shelf provided in the partition wall to support the stored foods, and
a plurality of projections are provided in the shelf, spaced apart a predetermined distance from each other and the plurality of the projections are projected backwardly, and
the fixing member comprises a ring which is able to be caught up in the projections to fix the blocking member to a predetermined position of the subsidiary storage compartment.

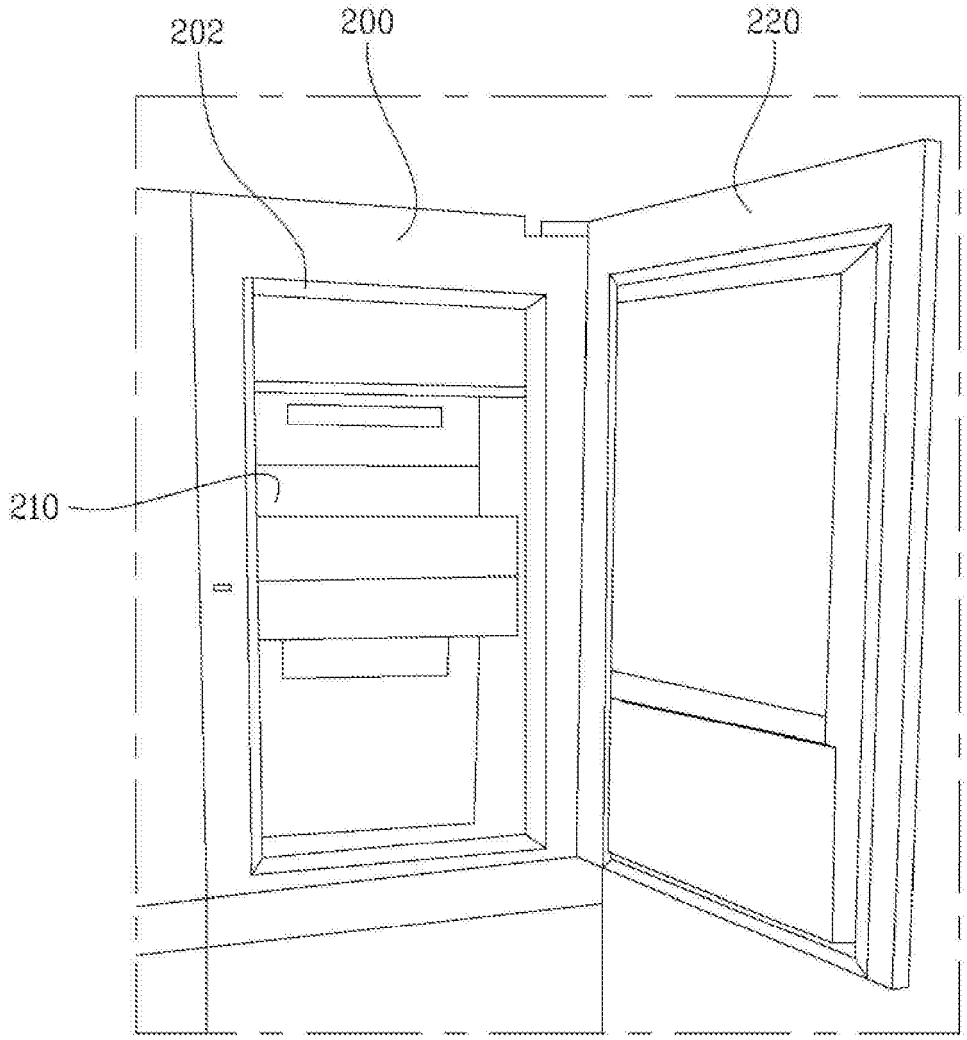
18. The refrigerator as claimed in claim 14, wherein the subsidiary storage compartment comprises,
a partition wall configured to define a predetermined room where foods are stored; and
at least shelf provided in the partition wall to support the stored foods, and
a plurality of hooking grooves are provided in the partition wall, spaced apart a predetermined distance from each other, and
the fixing member comprises a fixing pole which is able to be inserted in the hooking grooves to fix the blocking member to a predetermined position of the subsidiary storage compartment.

19. The refrigerator as claimed in claim 14, wherein the subsidiary storage compartment comprises,
a partition wall configured to define a predetermined room where foods are stored; and
at least one shelf provided in the partition wall to support the stored foods, and
a steel surface formed of steel is provided in the shelf, and
the fixing member comprises a magnet which is able to be attached to the steel surface to fix the blocking member to a predetermined position of the subsidiary storage compartment.

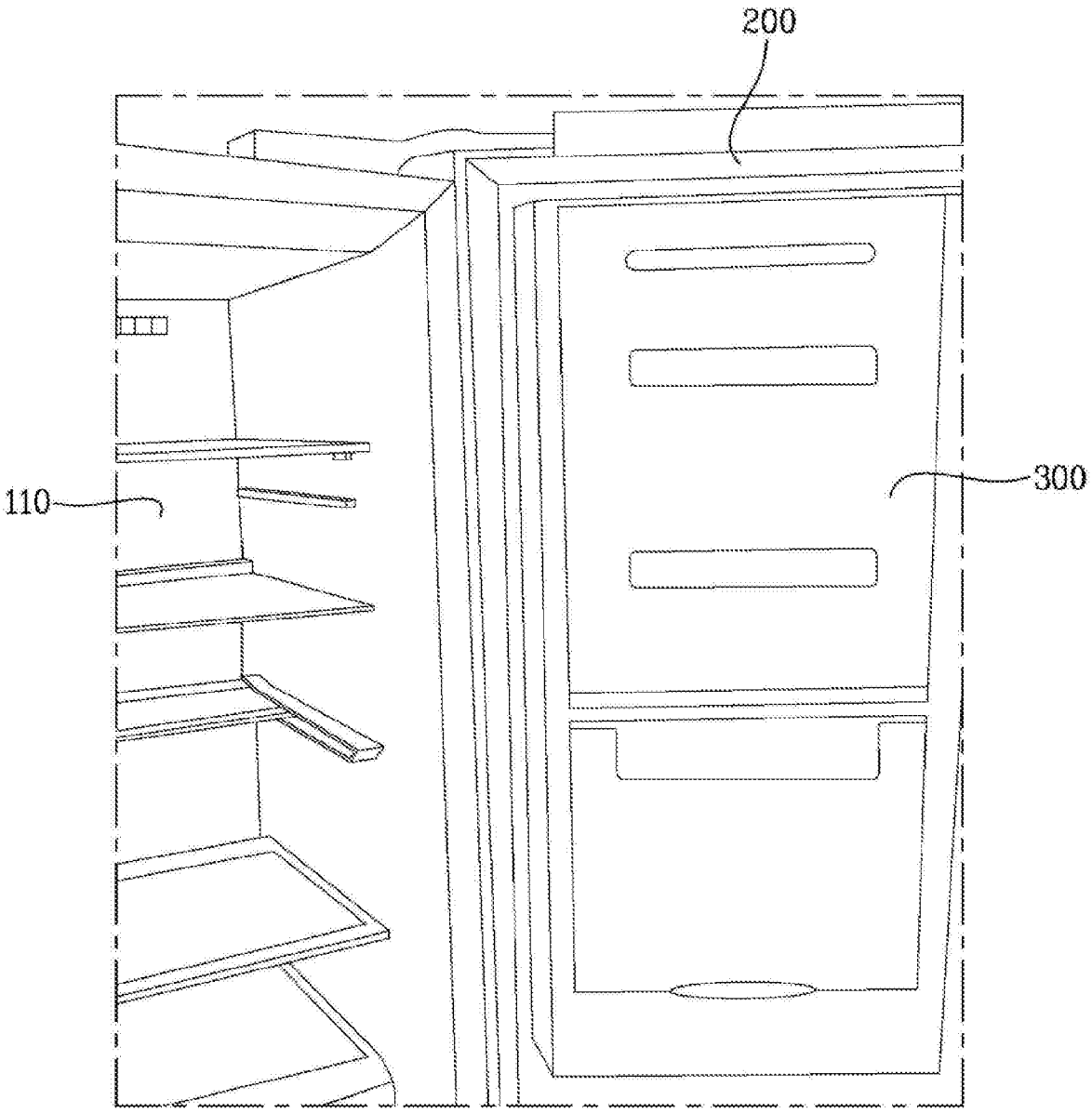
【Fig. 1】



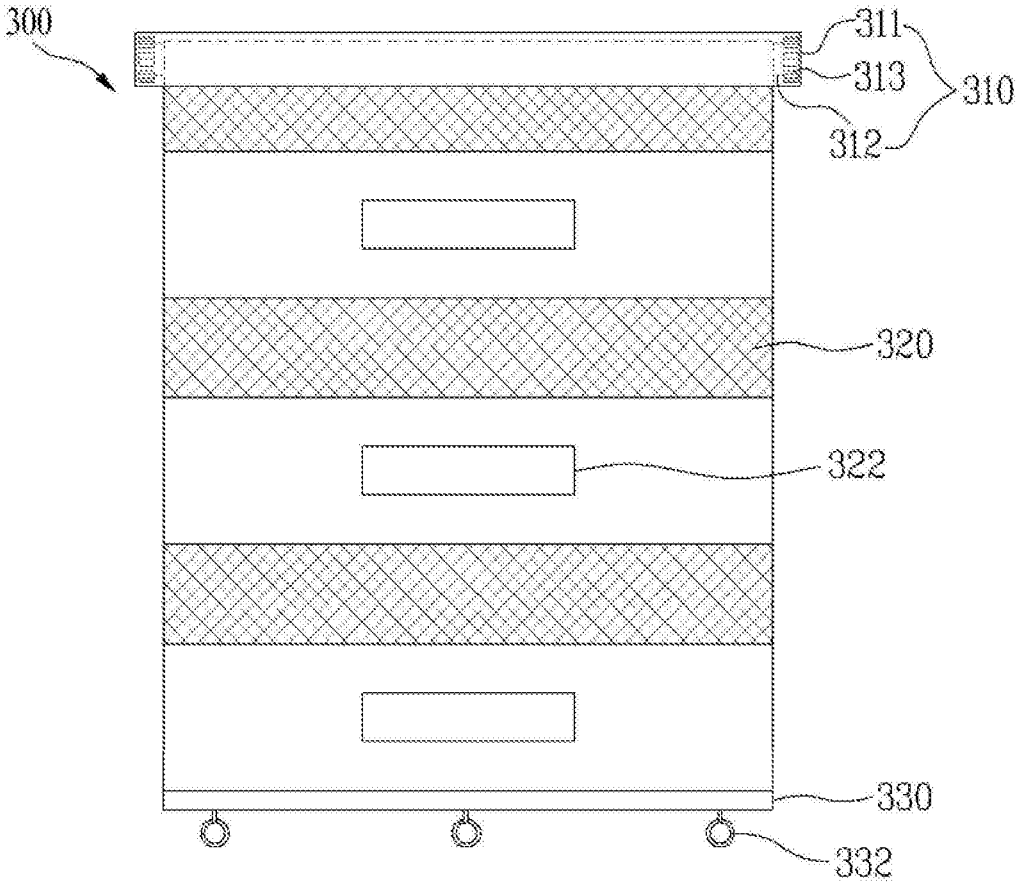
【Fig. 2】



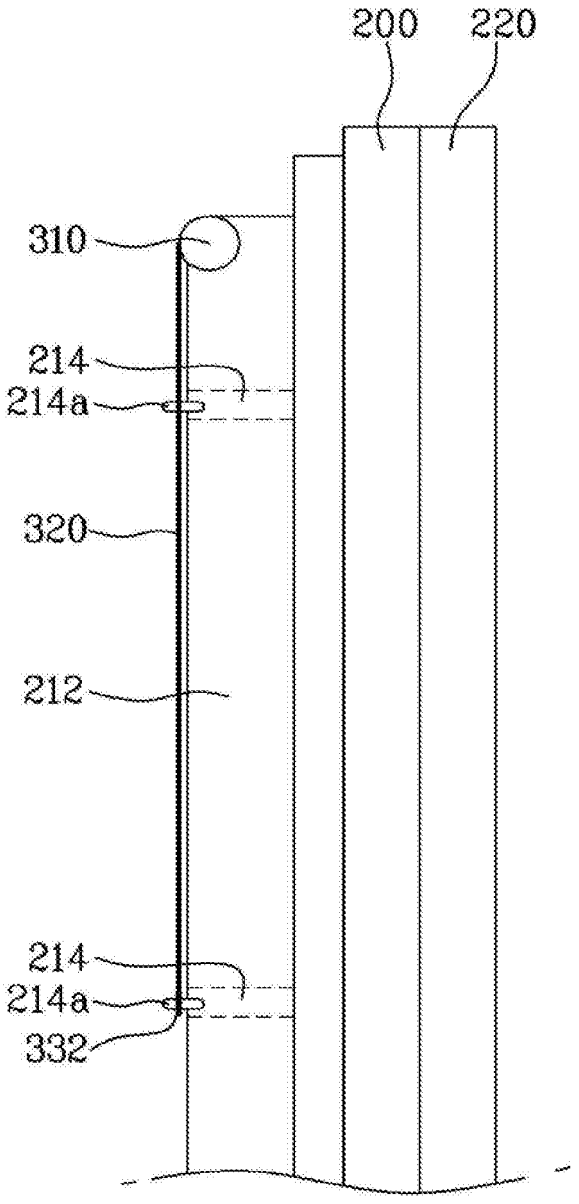
【Fig. 3】



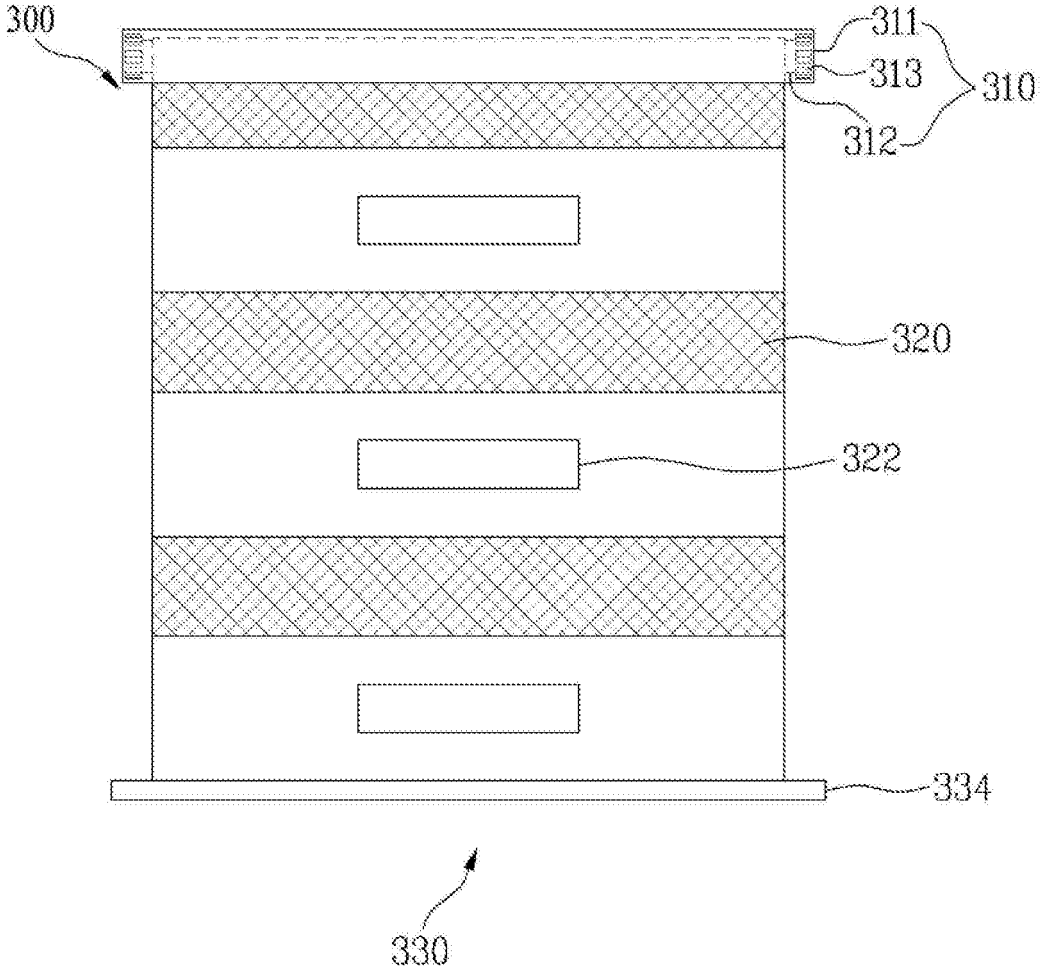
【Fig. 4】



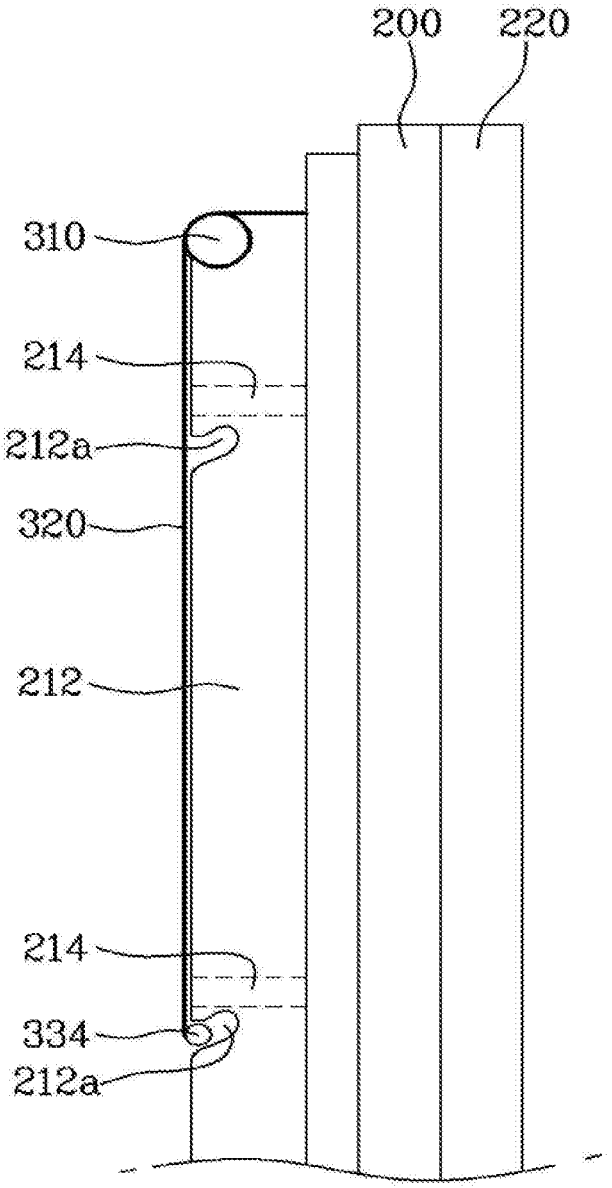
【Fig. 5】



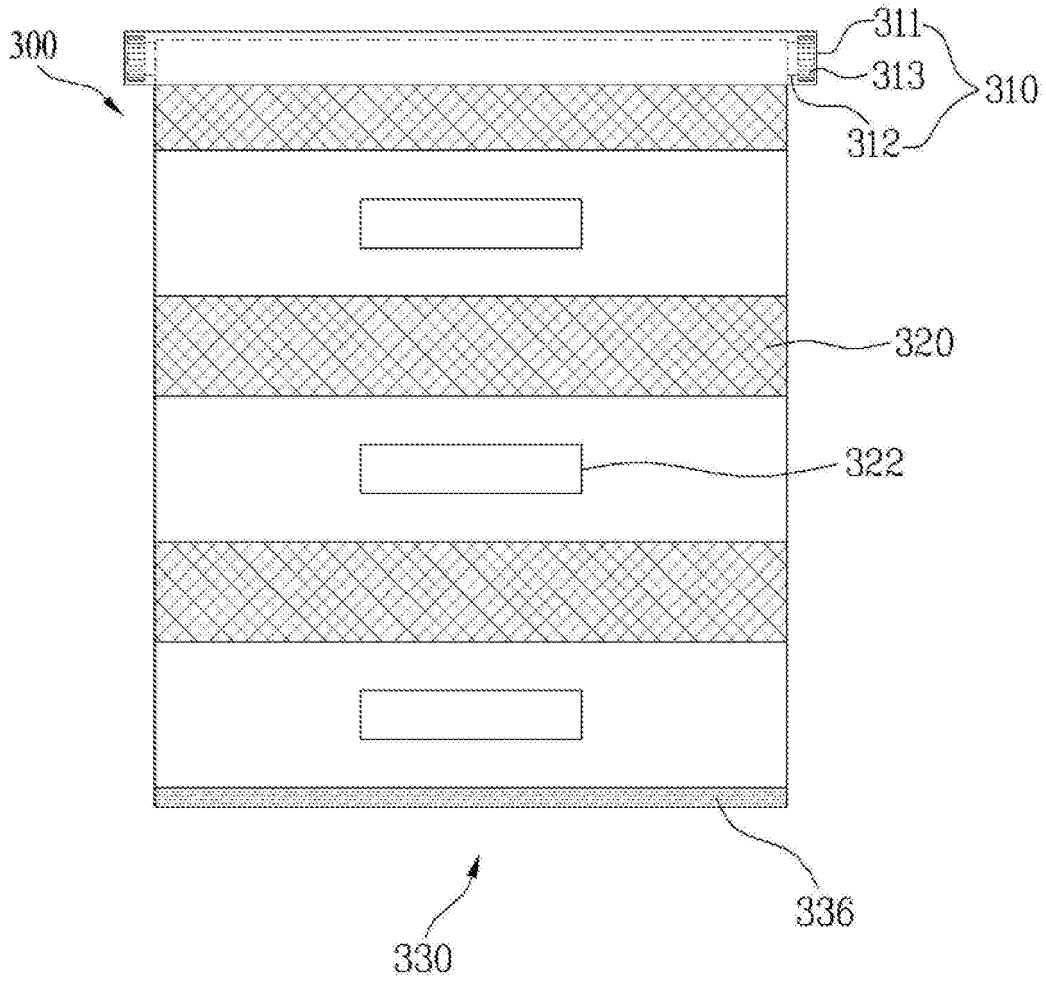
【Fig. 6】



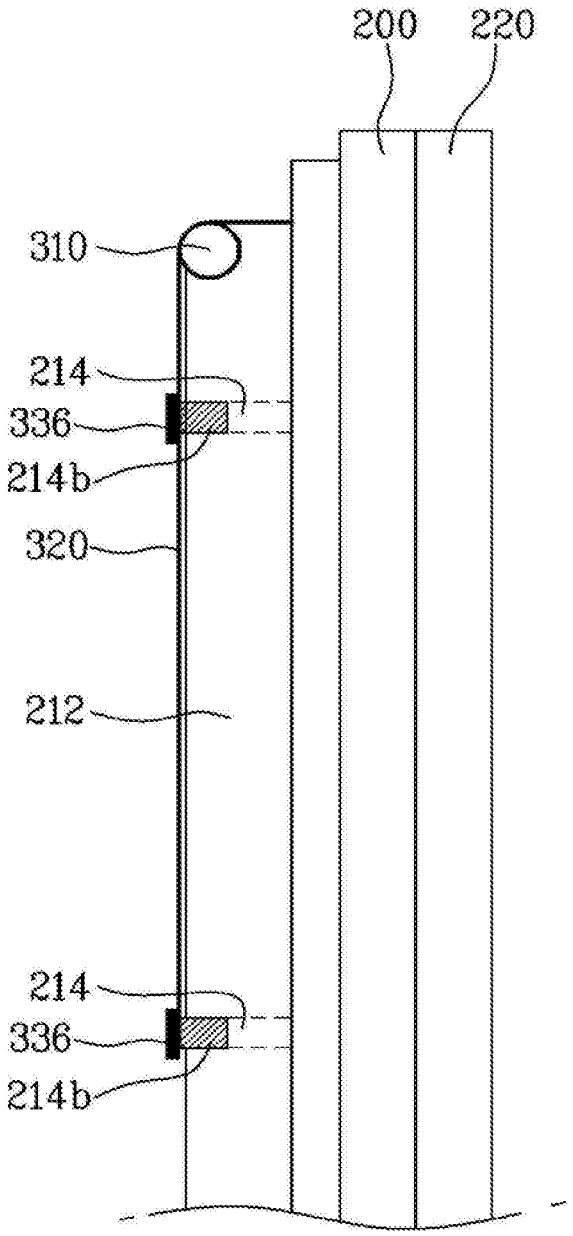
【Fig. 7】



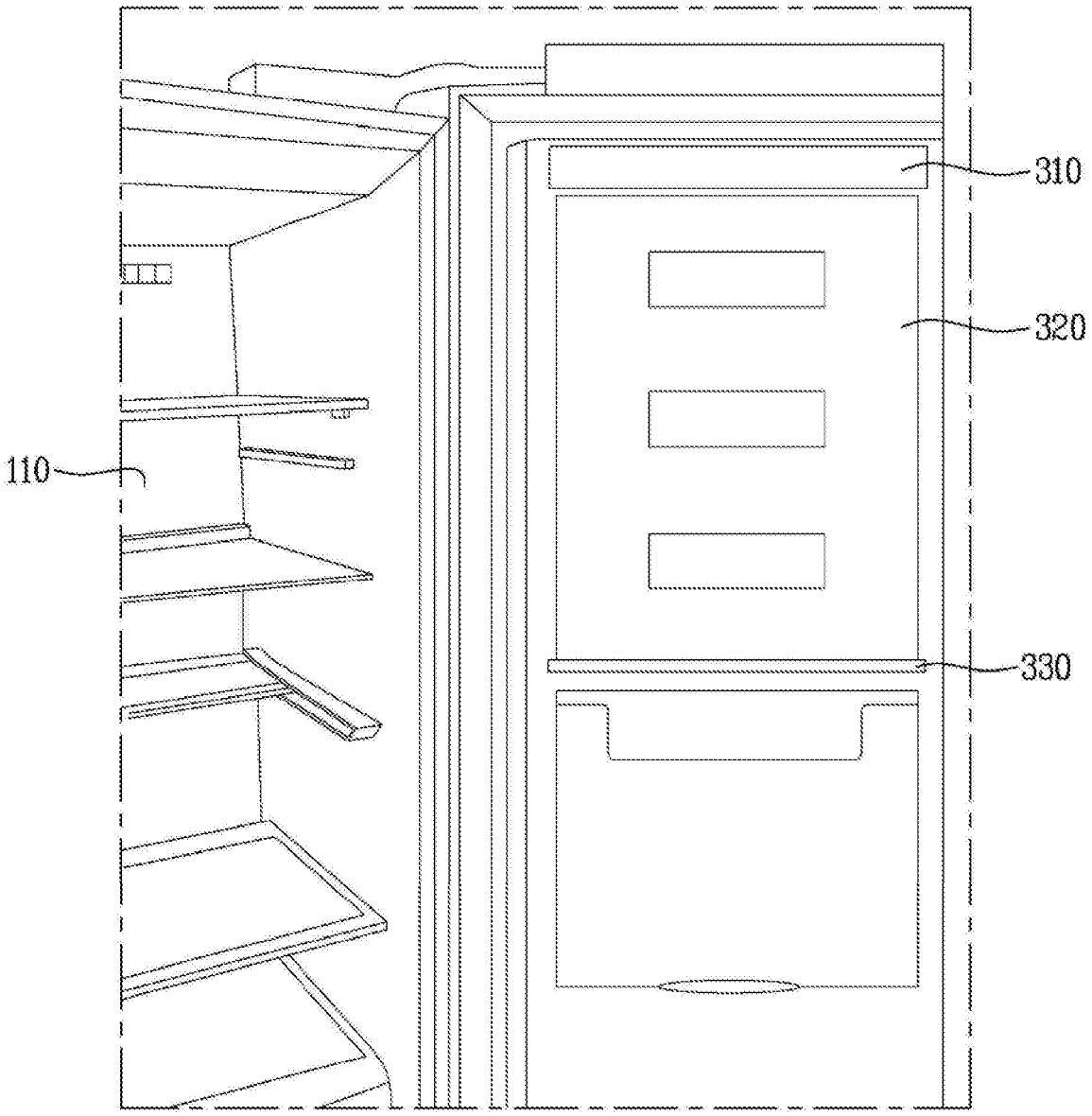
【Fig. 8】



【Fig. 9】



【Fig. 10】



【Fig. 11】