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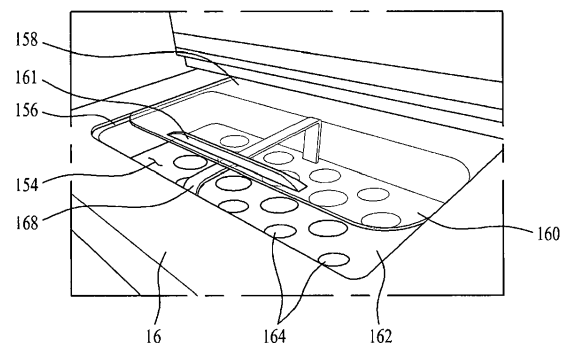
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(54) **Refrigerator**

(57) A refrigerator (10) is provided. The refrigerator (10) may include a barrier (16) that partitions an interior of the refrigerator (10) into a freezing compartment (32) and a refrigerating compartment (22), a recess (154) formed in the barrier (16) and having a predetermined depth, and a cover (160) for opening or closing a top of the recess (154). A seating step (156) may be formed at a peripheral portion of the recess (154) to receive a peripheral portion of the cover (160) seated thereon. A guide groove (158) may extend from the seating step (156) to guide movement of the cover (160). Storage items may be stored in the recess (154) independently of other food articles.

FIG. 3



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Description

BACKGROUND

1. Field

[0001] This relates to a refrigerator, and more particularly, to a refrigerator efficiently utilizing interior space thereof.

2. Background

[0002] Generally, a refrigerator stores items in a frozen or refrigerated state by lowering an internal temperature of a compartment thereof through discharge of cold air generated by a refrigeration cycle including a compressor, a condenser, and an expansion valve, and an evaporator. Such a refrigerator may include a freezing compartment for storing items in a frozen state, and a refrigerating compartment for storing items at low temperature. A Kimchi refrigerator may store items such as Kimchi or vegetables in a fresh state.

[0003] A refrigerator may include a plurality of doors, at least one of the plurality of doors being connected to a refrigerator body by hinges to open or close a front side of the refrigerator body. In addition to the hinged door, the refrigerator may include a drawer type door mounted to a front wall of a drawer slidably installed in the refrigerator. Items of various sizes and shapes may be stored in the freezing and refrigerating compartments, which may include a plurality of racks to vertically partition the storage compartment to receive such items. Enhancing utility of the inner space of the refrigerator may provide greater refrigerator capacity.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The embodiments will be described in detail with reference to the following drawings in which like reference numerals refer to like elements wherein:

[0005] FIG. 1 is a front view of a refrigerator according to an exemplary embodiment as broadly described herein;

[0006] FIG. 2 is a front view of the refrigerator shown in FIG. 1, with its doors open;

[0007] FIGs. 3 and 4 are perspective views of an auxiliary storage space formed in a barrier of a refrigerator, according to an embodiment as broadly described herein;

[0008] FIGs. 5 and 6 are perspective views of an auxiliary storage space formed in a barrier of a refrigerator, according to another embodiment as broadly described herein; and

[0009] FIG. 7 is a side sectional view of the refrigerator shown in FIGs. 1 and 2, illustrating placement of a recess in a barrier.

DETAILED DESCRIPTION

[0010] Reference will now be made in detail to various embodiments, examples of which are illustrated in the accompanying drawings.

[0011] In accordance with the refrigerator illustrated in the embodiment shown in FIGs. 1 and 2, the refrigerator, which is designated by reference numeral "10", is applicable not only to a top mount type refrigerator in which the inner space of the refrigerator is vertically partitioned to define a freezing compartment and a refrigerating compartment such that the freezing compartment is arranged above the refrigerating compartment, but also to a side-by-side type refrigerator in which the inner space of the refrigerator is laterally partitioned to define a freezing compartment and a refrigerating compartment such that the freezing compartment and refrigerating compartment are laterally arranged. Simply for ease of discussion and illustration, embodiments will be described in conjunction with a bottom freezer type refrigerator. That is, the inner space of the exemplary refrigerator 10 is vertically partitioned to define a freezing compartment 32 positioned below the refrigerating compartment 22.

[0012] Generally, the freezing compartment 32 may be maintained at a sub-zero temperature, and the refrigerating compartment 22 may be maintained at a temperature relatively higher than that of the freezing compartment 32.

[0013] The refrigerator 10 may include a body which defines an outer appearance of the refrigerator 10 while also protecting mechanical devices received therein. The body of the refrigerator 10 may include an outer case 12 which defines an outer appearance of the refrigerator 10, and an inner case 14 which defines storage compartments therein, namely, the freezing compartment 32 and the refrigerating compartment 22. A certain space may be defined between the outer case 12 and the inner case 14. A passage for circulation of cold air may be formed in the space.

[0014] A machinery chamber may be formed in the space between the outer case 12 and the inner case 14 to accommodate a refrigerant cycle device for generating cold air through circulation of a refrigerant. Using the refrigerant cycle device, the interior of the refrigerator 10 may be maintained at low temperature to keep a desired freshness level of items stored in the refrigerator 10. The refrigerant cycle device may include, for example, a compressor for compressing a refrigerant, and an evaporator for changing the phase of the refrigerant from liquid to gas, to cause the refrigerant to exchange heat with the outside of the refrigerant cycle device.

[0015] The refrigerator 10 may include a freezing compartment door 30 for opening or closing the freezing compartment 32, and a refrigerating compartment door 20 for opening or closing the refrigerating compartment 22. Each of the freezing compartment door 30 and refrigerating compartment door 20 may be pivotally mounted to the body of the refrigerator 10 at one end thereof by hing-

es. Each of the freezing compartment door 30 and refrigerating compartment door 20 may include a plurality of doors. That is, as shown in FIG. 2, each of the freezing compartment door 30 and refrigerating compartment door 20 may be configured such that it opens forward while being pivotally moved about opposite lateral edges of the refrigerator 10.

[0016] A barrier 16 may be positioned between the freezing compartment 32 and the refrigerating compartment 22, to partition the freezing compartment 32 and refrigerating compartment 22. The barrier 16 may be formed at the inner case 14 such that it has a certain thickness. The barrier 16 may extend horizontally to vertically partition the freezing compartment 32 and refrigerating compartment 22 such that the freezing compartment 32 and refrigerating compartment 22 are disposed below and above the barrier 16, respectively.

[0017] A partition wall 18 may be positioned in the freezing compartment 32, for example at a central portion thereof to partition the freezing compartment 32 into two separate spaces. The partition wall 18 may be vertically installed at the inner case 14 such that the freezing compartment 32 is divided into two laterally arranged compartments. In this case, the freezing compartment door 30 may include two doors for opening or closing respective freezing compartments 32.

[0018] In the embodiment shown in FIGs. 1 and 2, there is no partition wall installed in the refrigerating compartment 22 to laterally partition the refrigerating compartment 22. However, a partition wall may be installed in the refrigerating compartment 22, as in the freezing compartment 32.

[0019] Racks, drawers, baskets, and the like may be disposed in each of the freezing compartment 32 and refrigerating compartment 22, to store various items.

[0020] A drawer 40 may be mounted in the freezing compartment and slidably extracted or retracted. Food and other such items may be stored in the drawer 40. A vertically-extending cover may be mounted to a front wall of the drawer 40 to preserve cold air in the freezing compartment 32 even when the freezing compartment door 30 is opened.

[0021] A plurality of drawers 40 may be provided in the freezing compartment 32. In this case, the drawers 40 may be arranged at opposite sides of the partition wall 18, and stacked vertically.

[0022] A light source 150 to emit light may be installed in the freezing compartment 32 and/or refrigerating compartment 22. The light source 150 may operate when the freezing compartment door 30 or refrigerating compartment door 20 is opened. The light source 150 may emit light toward the interior of the freezing compartment 32 and/or refrigerating compartment 22 to improve visibility therein.

[0023] As shown in detail in FIGs. 3, 4 and 7, the refrigerator shown in FIGs. 1 and 2, in accordance with an embodiment as broadly described herein, may include a recess 154 formed at the barrier 16, the barrier 16 ex-

tending horizontally in the inner case 14 to partition the freezing and refrigerating compartments such that the recess 154 may also extend horizontally and have a predetermined depth. The refrigerator may also include a cover 160 for opening or closing a top of the recess 154.

[0024] In certain embodiments, the depth of the recess 154 may be greater than a thickness of the cover 160. Accordingly, when the cover 160 is fitted in the recess 154, a space may be defined in the interior of the recess 154, between the bottom of the recess 154 and the cover 160 to receive items therein for storage. A maximum depth of the recess 154 may be less than a thickness of the barrier 16. The recess 154 may have various different depths depending on the kinds of items to be received in the recess 154 and the amount of space available in the barrier 16.

[0025] A seating step 156 may be formed at a peripheral portion of the recess 154 on which a peripheral portion of the cover 160 may be seated. The seating step 156 may be higher than the bottom of the recess 154 while being lower than an upper surface portion of the barrier 16 surrounding the seating step 156. A size and shape of the seating step 156 may be the same as or similar to those of the peripheral portion of the cover 160. For example, when the cover 160 has a rectangular shape, the seating step 156 may have a similar shape so that the cover 160 may be positioned to cover the open top of the recess 154 simply by seating the cover 160 on the seating step 156.

[0026] A guide groove 158 may extend rearward from the seating step 156, to guide movement of the cover 160. The guide groove 158 may guide the cover 160 in a rear direction along a top of the barrier 16 (corresponding to an inside of the drawing shown in FIG. 3). When the cover 160 moves toward the rear of the barrier 16, the recess 154 may be opened/accessible. Thus, in this arrangement, the cover 160 need not be fully separated from the barrier 16 in order to provide access to the interior of the recess 154.

[0027] In alternative embodiments, it may be possible to form the guide groove 158 such that it instead extends from the seating step 156 toward a front side of the barrier 16. In this case, the guide groove 158 may extend forward from the seating step 156, to guide the cover 160 toward the front side of the barrier 16. When the cover 160 moves toward the front side of the barrier 16, the recess 154 may be opened/accessible. This configuration is considered an alteration of the position of the guide groove 158, and, as such, no further detailed description thereof will be provided with reference to separate drawings.

[0028] The guide groove 158 may have substantially the same width as the cover 160 to allow the cover 160 to stably move along the guide groove 158. In certain embodiments, the guide groove 158 may have a greater length than the cover 160 to allow the cover 160 to move longitudinally along the guide groove 158 such that the cover 160 may be completely moved away from the re-

cess 154 in the longitudinal direction, thereby completely opening the recess 154.

[0029] In certain embodiments, the width of the seating step 156 defined between opposite lateral portions of the peripheral edge of the seating step 156 may be the same as the width of the guide groove 158. In this case, the cover 160 may smoothly move from the seating step 156 to the guide groove 158 without being obstructed. Thus, the guide groove 158 may have the same height as the seating step 156 so that the cover 160 may easily move from the seating step 156 to the guide groove 158 or from the guide groove 158 to the seating step 156.

[0030] A plurality of aligned lugs may be provided at a boundary between the guide groove 158 and the seating step 156. The lugs may maintain the cover 160 positioned at the guide groove 158 or positioned at the seating step 156, unless the user applies force of a certain level or more to the cover 160.

[0031] When the cover 160 is guided along the guide groove 158 after being moved away from the seating step 156, the recess 154 may be opened and accessible to receive storage items. Thereafter, the user may move the cover 160 back onto the seating step 156 to close the recess 154.

[0032] In certain embodiments, a plate 162 having a plurality of grooves 164, or openings 164, formed therein for receiving storage items such as, for example, eggs may be received in the recess 154. For example, each of the grooves 164 may have a truncated spherical shape capable of receiving, for example, an egg. A shape of the grooves 164 may be adjusted to receive particular storage items as appropriate. As shown in FIG. 4, the plate 162 may be detachably mounted in the recess 154. In order to fix the plate 162 at a predetermined level in the recess 154, various level fixing approaches may be used. For example, a plurality of fixing protrusions may be formed on an inner surface of the recess 154 at various levels to fix the plate 162 at a selected one of the various levels.

[0033] A handle 168 may be provided at the plate 162, upwardly protruded from the plate 162 to facilitate removal of the plate 162 from the recess 154. The handle 168 may have, for example, an inverted-U shape, to allow a user to grasp a middle portion of the handle 168. Other arrangements may also be appropriate.

[0034] Opposite ends of the handle 168 may be disposed at opposite ends of the plate 162 so that, when the user lifts the handle 168, force may uniformly transferred to the plate 162 and the plate 162 may be stably lifted. Other arrangements may also be appropriate.

[0035] Since eggs may be easily broken, it may be difficult to store eggs in a stacked state. Also, storage of eggs may require careful attention, as compared to other items, due to propagation of bacteria which may occur due to foreign matter attached to the surfaces of eggs. To this end, the recess 154 may be sealed from other spaces of the refrigerating compartment 22 by the cover 160 to effectively store eggs in the recess 154.

[0036] A knob 161 may be provided at an upper surface of the cover 160. The knob 161 may protrude upward to a certain height from the cover 160 so that the user may move the cover 160 forward and rearward along the guide groove 158 by grasping the knob 161. The movement range of the cover 160 may be limited between a front edge of the seating step 156 and a rear edge of the seating step 156, from which the guide groove 158 extends.

[0037] The user may separate the cover 160 from the seating step 156 or guide groove 158 because the cover 160 may be simply positioned on the seating step 156 or guide groove 158 without using any additional mounting or securing members.

[0038] The cover 160 may be made of a transparent material so that items received in the recess 154 may be identified even when the cover 160 is closed, without moving the cover 160 to open the recess 154.

[0039] In the embodiment shown in FIGs. 5 and 6, a depth of the recess 154 may be less than that of the embodiment of FIGs. 3 and 4 such that it may only receive a tray 160a. That is, a depth of the recess 154 may be less than or equal to the thickness of the tray 160a, or equal to the depth of the seating step 156 of the embodiment shown in FIGs. 3 and 4.

[0040] In this embodiment, the previously discussed cover 160 may take the form of the tray 160a, which may be slidably seated in the recess 154. When items are to be removed from the refrigerator, the items may be temporarily placed on the tray 160a, and then the tray 160a may be used to simultaneously move the items. For example, a plurality of side dish containers received in the refrigerator may be simultaneously moved to a desired place using the tray 160a.

[0041] The tray 160a may be formed, at an upper surface thereof, with a flat surface having a sufficiently large area to allow a plurality of articles to be laid thereon. Upwardly-protruded lugs may be formed at the upper surface of the tray 160a, along a peripheral portion of the tray 160a, in order to prevent articles laid on the tray 160a from being separated from the tray 160a.

[0042] A guide groove 158 may extend from the recess 154, to guide movement of the tray 160a. A depth of the guide groove 158 may be equal to the depth of the recess 154. When the guide groove 158 and recess 154 have the same depth, it may be possible to move the tray 160a along the guide groove 158 and recess 154.

[0043] The guide groove 158 may extend toward a front side of the barrier 16 (corresponding to an outside of the drawing shown in FIG. 5 or 6). A width of the guide groove 158 may be equal to the width of the recess 154 while being similar to the width of the tray 160a.

[0044] The tray 160a may be removed from the recess 154 along the guide groove 158 and out of the refrigerator. Since the guide groove 158 extends in the extraction direction of the tray 160a, the user may easily extract the tray 160a after grasping one side of the tray 160a when the tray 160a has been moved to the guide groove 158. Since the tray 160a has a simple structure as described

above, the manufacture thereof may be easily achieved, and the structure for receiving the tray 160a in/on the barrier 16 may also be simplified.

[0045] As shown in FIGs. 5 and 6, the guide groove 158 may extend to a boundary of the barrier 16. That is, the recess 154 may substantially extend to an end of the barrier 16 when the barrier 16 is viewed from the front side. In this case, the end of the barrier 16 may be opened.

[0046] The guide groove 158 may have a rectangular shape, and may have the same width as the tray 160a. The length of the guide groove 158, perpendicular to the width of the guide groove 158, may be shorter than the length of the tray 160a.

[0047] In alternative embodiments, the length of the guide groove 158 may be longer than the length of the tray 160a. When the tray 160a is long, it may be possible to position items on the tray 160a after partially extracting the tray 160a, and then to move the tray 160a to a desired place.

[0048] Alternatively, the end of the barrier 16 may not be opened. In this case, the guide groove 158 does not extend to the end of the barrier 16. In this case, an inclined surface having a gentle inclination may be formed at an end of the guide groove 158 adjacent to the end of the barrier 16. When the user extracts the tray 160a from the recess 154, the tray 160a may be raised along the inclined surface after passing the guide groove 158 so the user may easily separate the tray 160a.

[0049] As apparent from the above description, the barrier may include an auxiliary storage space capable of storing items such as eggs independently of other items. Accordingly, it may be possible to independently and individually store such items without undue attention.

[0050] Also, a tray may be removably installed at the barrier, to enable simultaneous movement of several items to enhance user convenience.

[0051] A refrigerator is provided that is capable of using a barrier, which partitions an internal space of the refrigerator into a freezing compartment and a refrigerating compartment, to provide additional storage space.

[0052] A refrigerator as embodied and broadly described herein may include a barrier for partitioning an interior of the refrigerator into a freezing compartment and a refrigerating compartment, a recess formed at the barrier while having a predetermined depth, a cover for opening or closing a top of the recess, a seating step formed at a peripheral portion of the recess, to allow a peripheral portion of the cover to be seated on the seating step, and a guide groove extending from the seating step, to guide movement of the cover.

[0053] The depth of the recess may be greater than a thickness of the cover.

[0054] The seating step may have a width defined between opposite portions of a peripheral edge of the seating step that is equal to a width of the guide groove.

[0055] The guide groove may extend toward a rear side of the freezing compartment or toward a rear side of the

refrigerating compartment.

[0056] The guide groove may extend toward a front side of the freezing compartment or toward a front side of the refrigerating compartment.

[0057] The refrigerator may further include a plate formed with a plurality of grooves for receiving eggs, the plate being received in the recess.

[0058] The plate may be provided with a handle upwardly protruded from the plate.

[0059] The barrier may extend horizontally to partition the freezing compartment and the refrigerating compartment.

[0060] A refrigerator in accordance with another embodiment as broadly described herein may include a barrier for partitioning an interior of the refrigerator into a freezing compartment and a refrigerating compartment, a recess formed at the barrier while having a predetermined depth, a tray disposed on the recess, and a guide groove extending from the recess, to guide movement of the tray.

[0061] The guide groove may have a width equal to a width of the recess.

[0062] The depth of the recess may be equal to a thickness of the tray.

[0063] Any reference in this specification to "one embodiment," "an embodiment," "example embodiment," etc., means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the invention.

The appearances of such phrases in various places in the specification are not necessarily all referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with any embodiment, it is submitted that it is within the purview of one skilled in the art to effect such feature, structure, or characteristic in connection with other ones of the embodiments.

[0064] Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the spirit and scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

Claims

1. A refrigerator, comprising:

a barrier partitioning an interior of the refrigerator into a freezing compartment and a refrigerating

compartment; and
 a recess formed in the barrier and having a pre-determined depth;
characterized in that
 the refrigerator further comprises:

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a cover selectively positioned across an open top of the recess;
 a seating step formed along a peripheral portion of the recess, wherein a corresponding peripheral portion of the cover is seated on the seating step; and
 a guide groove extending outward from the seating step along the barrier to guide a sliding movement of the cover.

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2. The refrigerator of claim 1, wherein the predetermined depth of the recess is greater than a thickness of the cover such that a storage space is formed between a bottom of the recess and the cover. 20
3. The refrigerator of claim 1, wherein a distance between two opposite outer peripheral edges of the seating step is equal to a width of the guide groove. 25
4. The refrigerator of claim 1, wherein the guide groove extends from the peripheral portion of the recess toward a rear side of the interior of the refrigerator.
5. The refrigerator of claim 1, wherein the guide groove extends from the peripheral portion of the recess toward a front side of the interior of the refrigerator. 30
6. The refrigerator of claim 5, wherein the cover comprises a tray that is slidably removable from and replaceable into the recess via the guide groove. 35
7. The refrigerator of claim 1, further comprising:

a plate received in the recess, the plate having a plurality of grooves formed therein for receiving storage items. 40
8. The refrigerator of claim 7, further comprising a handle that protrudes upward from the plate. 45
9. The refrigerator of claim 1, wherein the barrier extends horizontally to partition the interior of the refrigerator, with the freezing compartment positioned below the refrigerating compartment. 50
10. The refrigerator of claim 1, wherein the freezing compartment is positioned below the barrier and the refrigerating compartment is positioned above the barrier. 55

FIG. 1

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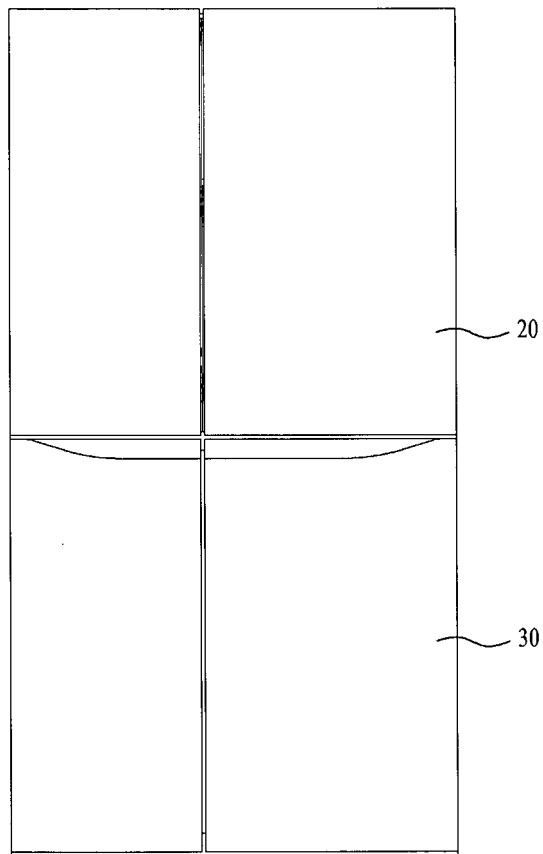


FIG. 2

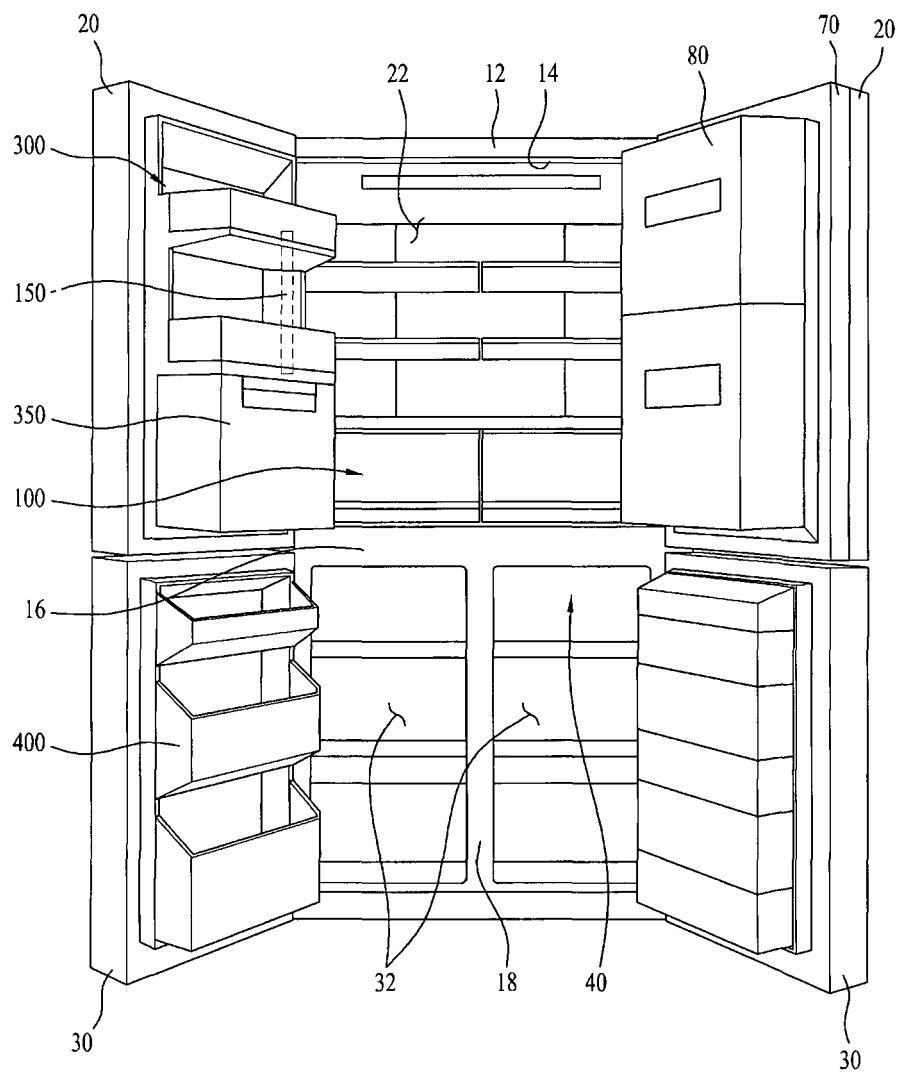


FIG. 3

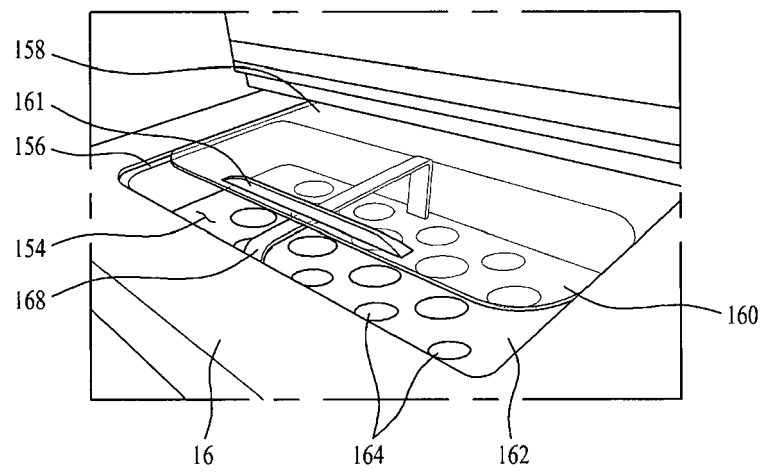


FIG. 4

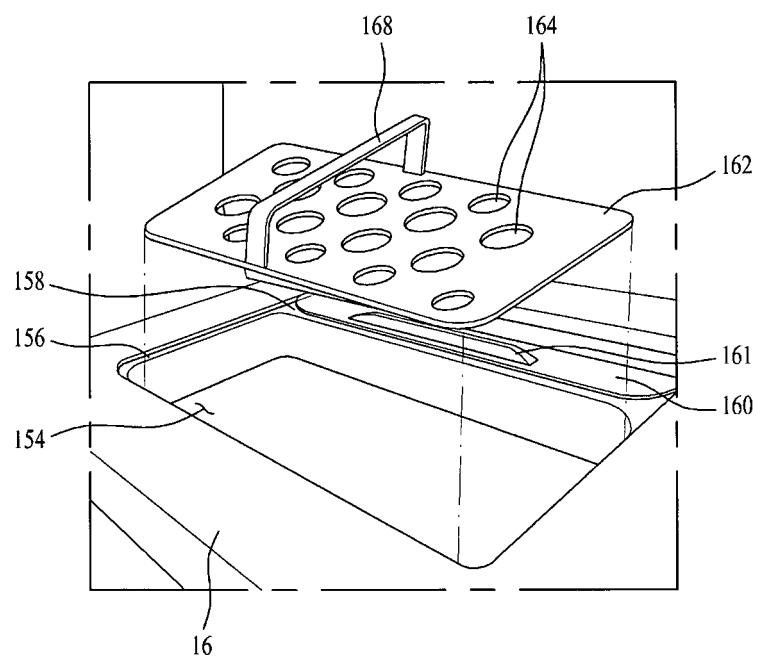


FIG. 5

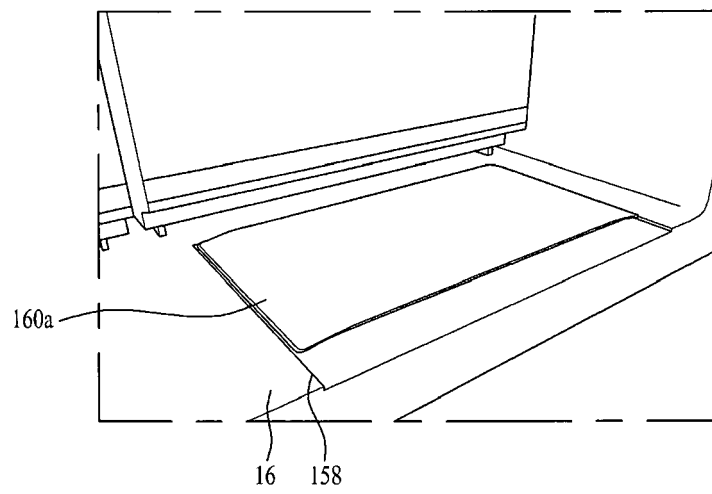


FIG. 6

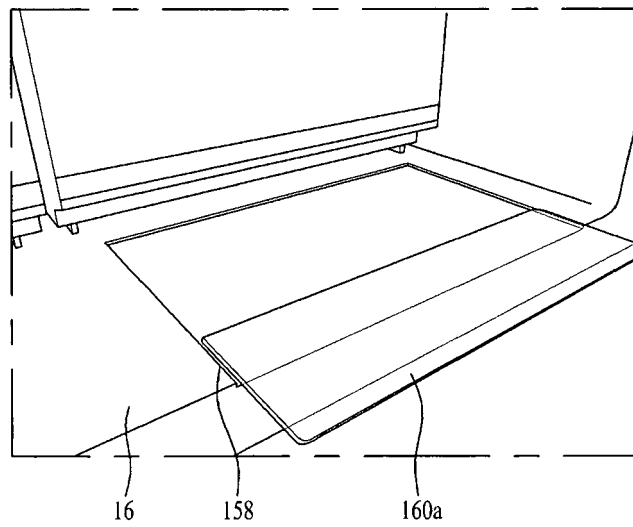


FIG. 7

