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(71) Applicant: **Samsung Electronics Co., Ltd**
Gyeonggi-do 443-742 (KR)

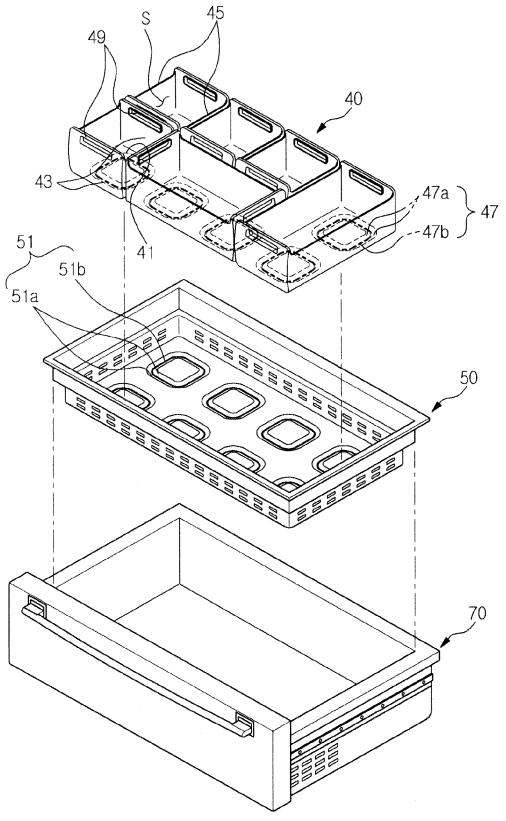
(72) Inventors:
- **Jeon, Sang Woon**
  Gyeonggi-do (KR)
- **Lee, Jae Moon**
  Seoul (KR)

(74) Representative: **Grünecker, Kinkeldey,**
Stockmair & Schwanhäusser
Leopoldstrasse 4
80802 München (DE)

(54) Storage unit and refrigerator having the same

(57) A storage unit and refrigerator that allows an internal space of an accommodating vessel to be divided into a plurality of sub-spaces by box-shaped division cases are provided. The refrigerator includes a body, a storage compartment having an open front, a door pivotably coupled to the body to open and close the open front of the storage compartment, division cases formed in a box shape to allow food to be stored therein, and an accommodating vessel to accommodate the division cases such that an internal space of the accommodating vessel is divided into sub-spaces. A bottom face of each of the division cases is provided with a protrusion, a bottom face of the accommodating vessel is provided with concave portions. The protrusions are fixed to the concave portions to allow the division cases to be accommodated in the accommodating vessel.

FIG. 2



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Description

BACKGROUND

1. Field

[0001] Embodiments of the present invention relate to a storage unit and a refrigerator having the same.

2. Description of the Related Art

[0002] A refrigerator is an appliance equipped with a storage compartment and a cold air supply unit to supply cold air to the storage compartment to keep food fresh.

[0003] The storage compartment may be maintained at a certain range of temperature required to keep food fresh.

[0004] The storage compartment of such a refrigerator may be provided with an open front, which is normally closed by a door or drawer to keep the temperature of the storage compartment constant.

[0005] The internal space of the drawer may be divided by movable partitions. However, dividing the internal space with partitions may lead to increase in material cost for components since a fixing structure for the partitions may be complex. Further, the complex fixing structure for the partitions may make it difficult to increase the number of sub-spaces into which the internal space is divided. Thus, the space may have an unpleasant appearance.

[0006] In addition, juice from food or any liquid in the space divided by the partitions may flow down and mix under the partitions.

SUMMARY

[0007] It is an aspect of the present invention to provide a refrigerator that allows division of an internal space of an accommodating vessel into a plurality of sub-spaces using box-shaped division cases.

[0008] Additional aspects of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned from practice of the invention.

[0009] In accordance with an aspect of the present invention, a refrigerator includes a body, a storage compartment provided in the body and having an open front, a door pivotably coupled to the body to open and close the open front of the storage compartment, a plurality of division cases formed in a box shape to allow food to be stored therein, and an accommodating vessel to accommodate the division cases therein such that an internal space of the accommodating vessel is divided into a plurality of sub-spaces by the division cases and to be stored in the storage compartment along with the division cases, wherein a bottom face of each of the division cases is provided with a protrusion protruding downward, a bottom face of the accommodating vessel is provided with a plurality of concave portions formed in a shape corresponding to a shape of the protrusion, and the protrusions are fixed to the concave portions to allow the division cases to be accommodated in the accommodating vessel.

[0010] Each of the division cases may include the bottom face, front and rear walls and lateral sidewalls, and may be provided with an accommodating space formed by the bottom face, front and rear walls and lateral sidewalls to have an open upper face, wherein the bottom face, front and rear walls and lateral sidewalls are integrally formed.

[0011] The protrusion of the bottom face of each of the division cases may be provided with a quadrangular edge protruding downward, and include a first protrusion protruding from inner and outer sides of the edge of the protrusion to be slanted toward a center of the protrusion, and a second protrusion protruding from a center of the first protrusion downward.

[0012] Each of the concave portions provided in the accommodating vessel may be provided with a quadrangular edge grooved downward in a shape corresponding to the shape of the protrusion, and include a first concave portion grooved to be slanted from inner and outer sides of the edge of the concave portion toward a center of the concave portion to have a shape corresponding to that of the first protrusion, and a second concave portion grooved from a center of the first concave portion downward.

[0013] The front and rear walls may be provided with knobs integrated with the front and rear walls to allow the division case to be placed in and drawn out of the accommodating vessel.

[0014] An ice vessel to make ice may be accommodated in the accommodating space of the division case and is detachably supported by the lateral sidewalls of the division case.

[0015] The ice vessel may include an ice making tray to make ice and a support supported by the lateral sidewalls of the division case.

[0016] At least one of the division cases may be formed in a square shape to be accommodated in the accommodating vessel, and the division case having the square shape may be provided with one protrusion.

[0017] At least one of the division cases may be formed in a rectangular shape to be accommodated in the accommodating vessel, and the division case having the rectangular shape may have a size two times that of the division case having a square shape and is provided with two protrusions.

[0018] The number of the concave portions provided in the accommodation vessel may be eight such that the division cases having the square shape may be disposed in two rows and four columns.

[0019] The accommodating vessel may accommodate the division cases having the square shape and the division cases having the rectangular shape, only the division cases having the square shape, or only the division

cases having the rectangular shape.

[0020] In accordance with another aspect of the present invention, a refrigerator includes a body, a storage compartment provided in the body and having an open front, a door pivotably coupled to the body to open and close the open front of the storage compartment, a drawer slidably coupled to the body to open and close the storage compartment and provided with a storage space therein, a plurality of division cases accommodated in the storage space of the drawer to allow food to be stored in the division cases, the division cases dividing the storage space into a plurality of sub-spaces, and an ice vessel to make ice, the ice vessel being detachably coupled to one of the division cases, wherein a bottom face of each of the division cases is provided with a protrusion protruding downward, a bottom face of the drawer is provided with a plurality of concave portions corresponding to a shape of the protrusion, and the protrusions are fixed to the concave portions to allow the division cases to be accommodated in the drawer.

[0021] Each of the division cases may include the bottom face, front and rear walls and lateral sidewalls, and the ice vessel may be supported by the lateral sidewalls and accommodated in an accommodating space formed by the bottom face, front and rear walls and lateral sidewalls to have an open upper face, wherein the bottom face, front and rear walls and lateral sidewalls are integrally formed.

[0022] The ice vessel may include an ice making tray to make ice and a support supported by the lateral sidewalls of the division case.

[0023] In accordance with another aspect of the present invention, a storage unit includes at least one division case provided with an accommodating space having an open upper face formed by a bottom face, front and rear walls and lateral sidewalls and including a protrusion protruding downward from the bottom face, the bottom face, front and rear walls and lateral sidewalls being integrally formed, and an accommodating vessel to accommodate the division case, the accommodating vessel including a concave portion grooved in a shape corresponding to a shape of the protrusion, wherein the at least one division case includes a plurality of division cases adapted to divide an internal space of the accommodating vessel into a plurality of sub-spaces and accommodated in the accommodating vessel such that the protrusion is fixed to the concave portion.

[0024] The division case may include knobs integrally formed on the front and rear walls to allow the division case to be moved.

[0025] The protrusion may be provided with a quadrangular edge protruding downward, and include a first protrusion protruding from inner and outer sides of the edge of the protrusion to be slanted toward a center of the protrusion, and a second protrusion protruding from a center of the first protrusion downward.

[0026] The concave portion may be provided with a quadrangular edge grooved downward in a shape corresponding to the shape of the protrusion, and include a first concave portion grooved to be slanted from inner and outer sides of the edge of the concave portion toward a center of the concave portion to have a shape corresponding to a shape of the first protrusion, and a second concave portion grooved from a center of the first concave portion downward.

[0027] An ice vessel to make ice may be accommodated in the accommodating space of the division case, and includes a support detachably supported by the lateral sidewalls of the division case.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028] These and/or other aspects of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

FIG. 1 illustrates a refrigerator according to an exemplary embodiment of the present invention;

FIG. 2 illustrates a container and division cases accommodated in a drawer according to an exemplary embodiment of the present invention;

FIG. 3 illustrates a square-shaped division case according to an exemplary embodiment of the present invention;

FIG. 4 illustrates a rectangular division case according to an exemplary embodiment of the present invention;

FIG. 5 illustrates the division case and container according to an exemplary embodiment of the present invention;

FIG. 6 illustrates accommodating an ice vessel in the division case according to an exemplary embodiment of the present invention;

FIGS. 7 to 10 illustrate a dividing the internal space of the container in various ways with the division cases according to an exemplary embodiment of the present invention; and

FIG. 11 illustrates division cases and a drawer according to another embodiment of the present invention.

DETAILED DESCRIPTION

[0029] Reference will now be made in detail to the embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

[0030] As illustrated in FIG. 1, a refrigerator includes a body 10, a storage compartment 20 provided in the body 10 and having an open front, a door 30 pivotably coupled to the body 10 to open and close the open front of the storage compartment 20, a plurality of division cases 40 formed in a box shape to allow food to be stored therein, an accommodating vessel 50 to accommodate the division cases 40 therein such that the internal space

of the accommodating vessel 50 is divided into a plurality of sub-spaces by the division cases 40 and to be stored in the storage compartment 20 along with the division cases 40.

[0031] The body 10 includes an inner case (not shown) forming the storage compartment 20, an outer case (not shown) forming an outer appearance of the body 10, and a cold air supply unit (not shown) to supply cold air to the storage compartment 20.

[0032] The cold air supply unit may include a compressor, a condenser, an expansion valve, an evaporator, a fan and a cold air duct, and a foamed insulation material (not shown) may be provided between the inner case and outer case to insulate the storage compartment 20.

[0033] The storage compartment 20 may be divided into an upper chamber 21, an intermediate chamber 23 and a lower chamber 25 vertically arranged, each of which may preserve food in a cooled or frozen state as necessary.

[0034] The intermediate chamber 23 and lower chamber 25 may be opened and closed by a drawer 70 that is slidably movable with respect to the body 10, and the upper chamber 21 may be opened and closed by the door 30 pivotably coupled to the body 10.

[0035] As illustrated in FIGS. 1 to 5, a storage unit allowing food to be stored therein may be accommodated in the intermediate chamber 23 or the lower chamber 25.

[0036] The storage unit may include a plurality of division cases 40 and a plurality of accommodating vessels 50 to accommodate the division cases 40 therein.

[0037] The division cases 40 may be formed in a box shape to allow food to be stored therein.

[0038] The division case 40 may be accommodated in the accommodating vessel 50 to be stored in the storage compartment 20, and a plurality of division cases 40 may be provided to divide the internal space of the accommodating vessel 50 into a plurality of sub-spaces.

[0039] The division case 40 includes a bottom face 41, front and rear walls 43 and lateral sidewalls 45, which may be integrally formed. An accommodating space S with an open upper face may be formed by the bottom face 41, front and rear walls 43 and lateral sidewalls 45.

[0040] As illustrated in FIG. 3, the division cases 300 may be formed in a square shape to be accommodated in the accommodating vessel 50. Each of the square-shaped division cases 300 may be provided with a protrusion 47.

[0041] As illustrated in FIG. 4, the division cases 400 may be rectangular to be accommodated in the accommodating vessel 50. Each of the rectangular division cases 400 may have a size, for example, two times that of the square-shaped division case 300 and be provided with two protrusions 47.

[0042] The division cases formed in the square and rectangle shapes are accommodated in the accommodating vessel 50 to divide the internal space of the accommodating vessel 50 into a plurality of sub-spaces.

[0043] The division cases 300 having the square shape and the division cases 400 having the rectangular shape may be accommodated together in the accommodating vessel 50. Alternatively, only the division cases having the square shape or the division cases having the rectangular shape may be accommodated in the accommodating vessel 50.

[0044] The bottom face 41 may be provided with a protrusion 41 protruding downward. The protrusion 47 may be fixed to a concave portion 51 of the accommodating vessel 50 to allow the division case 40 to be fixed and accommodated in the accommodating vessel 50.

[0045] The protrusion 47, which is provided with a quadrangle-shaped edge protruding downward, includes a first protrusion 47a protruding from the inner and outer sides of the edge of the protrusion 47 to be slanted toward the center of the protrusion 47, and a second protrusion 47b protruding from the center of the first protrusion 47a downward.

[0046] The front and rear walls 43 may be provided with knobs 49 integrated with the front and rear walls 43 to allow the division cases 40 to be placed in, and drawn out, of the accommodating vessel 50.

[0047] As illustrated in FIG. 6, an ice vessel 60 to make ice may be accommodated in the accommodating space S of the division case 40.

[0048] The ice vessel 60 includes an ice making tray 61 to make ice and a support 63 detachably supported by the lateral sidewalls 45 of the division case 40.

[0049] FIG. 6 illustrates that the ice vessel 60 may be accommodated in the accommodating space S of the division case 40. The division case 40, itself, may function as an ice vessel to make ice.

[0050] When the division case 40, itself, functions as an ice vessel, an ice making device (not illustrated) may be disposed on the division case 40, and, a user may be provided with more convenience as supply of water to the division case 40 and movement of the division case 40 are facilitated.

[0051] When a large amount of water is needed, the division case 40, itself, may be drawn out to retrieve ice.

[0052] The accommodating vessel 50 accommodating the division cases 40 and having an internal space divided into a plurality of sub-spaces by the division cases 40 may be accommodated in the drawer 70 and stored in the chamber 23 or 25, along with the division cases 40.

[0053] The accommodating vessel 50 may be formed to have a size several times that of the division case 40 to allow the inner space of the accommodating vessel 50 to be divided into a plurality of sub-spaces.

[0054] The bottom face of the accommodating vessel 50 to accommodate the division cases 40 may be provided with a plurality of concave portions 51 having a shape corresponding to that of the protrusions 47 of the division cases 40.

[0055] Each of the concave portions 51 may be provided with a quadrangular edge grooved downward to have a shape corresponding to that of the protrusion 47, and includes a first concave portion 51a grooved to be

slanted from the inner and outer sides of the edge of the concave portion 51 toward the center of the concave portion 51 to have a shape corresponding to that of the first protrusion 47a of the protrusion 47, and a second concave portion 51b grooved from the center of the first concave portion 51a downward.

[0056] When the division case 40 is accommodated in the accommodating vessel 50 such that the protrusion 47 of the division case 40 is fixed to the concave portion 51 of the accommodating vessel 50, the first protrusion 47a and second protrusion 47b of the protrusion 47 are respectively inserted into, and fixed to, the first concave portion 51a and second concave portion 51b.

[0057] Eight concave portions 51 may be provided to dispose the square-shaped division cases 40 in two rows and four columns.

[0058] FIGS. 1 to 5 illustrate that eight concave portions 51 may be provided, but embodiments of the present invention are not limited thereto. For example, depending on the size of the division case 40, the number the concave portions 51 provided may be varied.

[0059] As illustrated in FIGS. 7 to 10, the division cases 40 may be arranged such that the internal space of the accommodating vessel 50 is divided in various ways.

[0060] The internal space of the accommodating vessel may be divided in various ways by the division cases, depending on the number of the concave portions provided in the accommodating vessel or the configuration of the division cases.

[0061] As illustrated in FIG. 11, the division case 110 may be directly accommodated in the internal space of the drawer 700 to be stored in the storage compartment 20, rather than being accommodated in the accommodating vessel 50.

[0062] The bottom face of the drawer 700 may be provided with a concave portion 71 having a shape corresponding to that of the protrusion 47 of the division case 110.

[0063] The configuration of the concave portion 71 provided in the bottom face of the drawer 700 may be similar as that of the concave portion 51 provided in the bottom face of the accommodating vessel 50.

[0064] As is apparent from the above description, according to embodiments of the present invention, improved accommodation of food may be provided, and stored food may be easily accessed and moved by unit block.

[0065] In addition, the foods may be stored separately from each other so as not to be mixed together, and material costs may be reduced.

[0066] Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

Claims

1. A refrigerator comprising:

a body;
a storage compartment provided in the body and having an open front;
a door pivotably coupled to the body to open and close the open front of the storage compartment;
a plurality of division cases formed in a box shape to allow food to be stored therein; and
an accommodating vessel to accommodate the division cases therein such that an internal space of the accommodating vessel is divided into a plurality of sub-spaces by the division cases and to be stored in the storage compartment along with the division cases,
wherein a bottom face of each of the division cases is provided with a protrusion protruding downward, a bottom face of the accommodating vessel is provided with a plurality of concave portions formed in a shape corresponding to a shape of the protrusion, and the protrusions are fixed to the concave portions to allow the division cases to be accommodated in the accommodating vessel.

2. The refrigerator according to claim 1, wherein each of the division cases includes the bottom face, front and rear walls and lateral sidewalls, and is provided with an accommodating space formed by the bottom face, front and rear walls and lateral sidewalls to have an open upper face, wherein the bottom face, front and rear walls and lateral sidewalls are integrally formed.

3. The refrigerator according to claim 2, wherein the protrusion of the bottom face of each of the division cases is provided with a quadrangular edge protruding downward, and includes a first protrusion protruding from inner and outer sides of the edge of the protrusion to be slanted toward a center of the protrusion, and a second protrusion protruding from a center of the first protrusion downward.

4. The refrigerator according to claim 3, wherein each of the concave portions provided in the accommodating vessel is provided with a quadrangular edge grooved downward in a shape corresponding to the shape of the protrusion, and includes a first concave portion grooved to be slanted from inner and outer sides of the edge of the concave portion toward a center of the concave portion to have a shape corresponding to that of the first protrusion, and a second concave portion grooved from a center of the first concave portion downward.

5. The refrigerator according to claim 2, wherein the

front and rear walls are provided with knobs integrated with the front and rear walls to allow the division case to be placed in and drawn out of the accommodating vessel.

6. The refrigerator according to claim 5, wherein an ice vessel to make ice is accommodated in the accommodating space of the division case and is detachably supported by the lateral sidewalls of the division case.

7. The refrigerator according to claim 6, wherein the ice vessel includes an ice making tray to make ice and a support supported by the lateral sidewalls of the division case.

8. The refrigerator according to claim 1, wherein at least one of the division cases is formed in a square shape to be accommodated in the accommodating vessel, and the division case having the square shape is provided with one protrusion.

9. The refrigerator according to claim 1, wherein at least one of the division cases is formed in a rectangular shape to be accommodated in the accommodating vessel, and the division case having the rectangular shape has a size two times that of the division case having a square shape and is provided with two protrusions.

10. The refrigerator according to any one of claims 8 and 9, wherein the number of the concave portions provided in the accommodation vessel is eight such that the division cases having the square shape are disposed in two rows and four columns.

11. The refrigerator according to claim 10, wherein the accommodating vessel accommodates the division cases having the square shape and the division cases having the rectangular shape, only the division cases having the square shape, or only the division cases having the rectangular shape.

FIG. 1

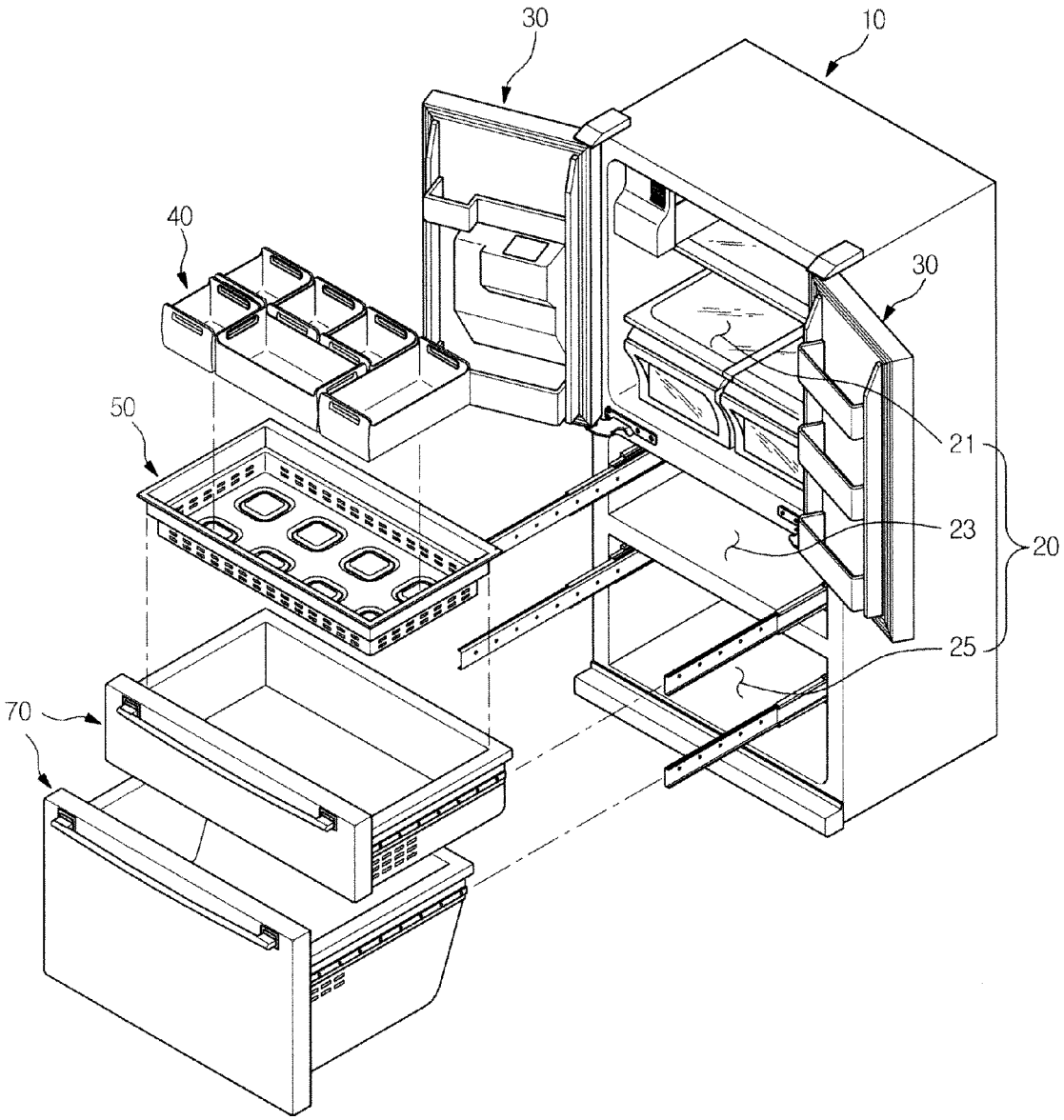

FIG. 2

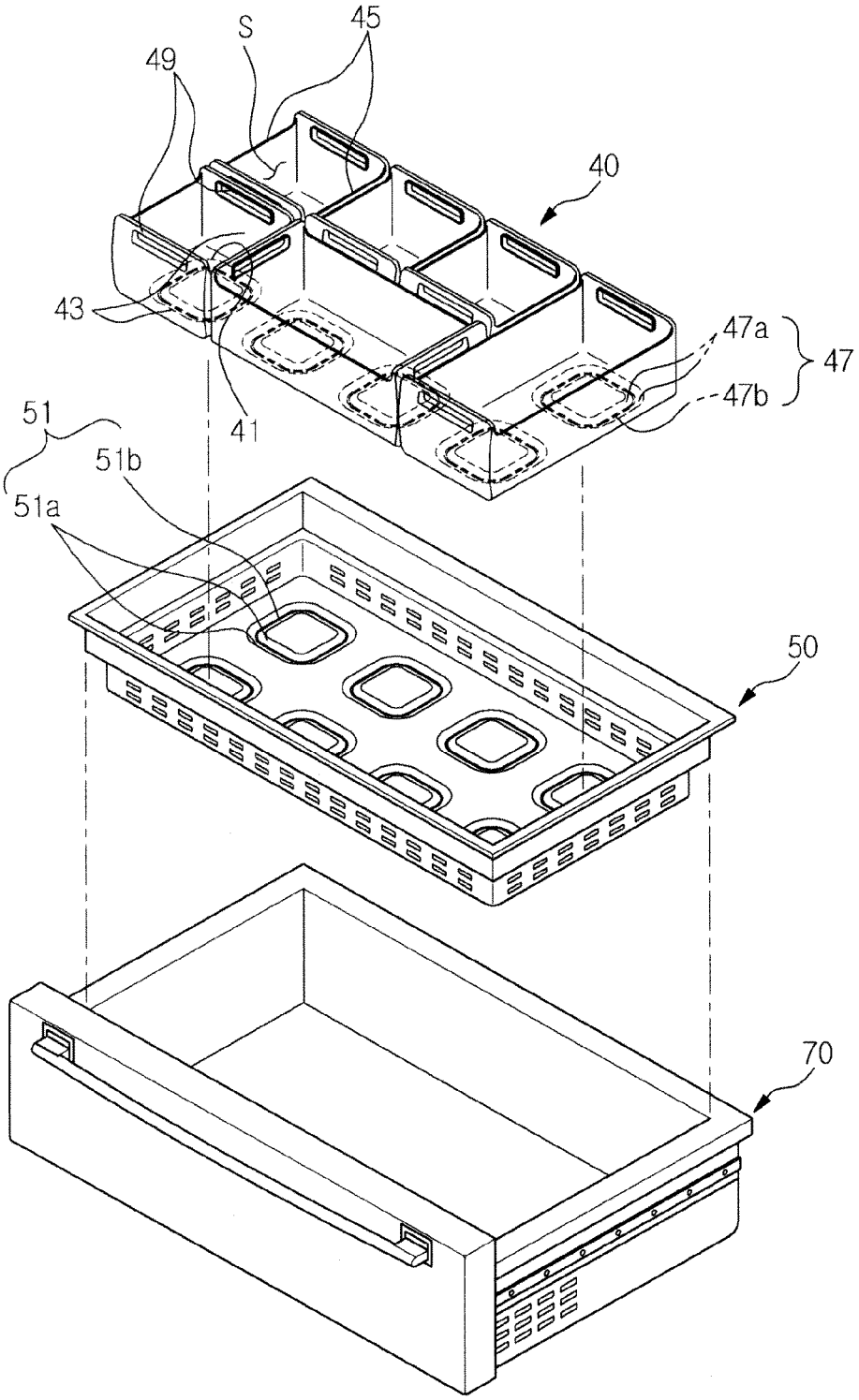

FIG. 3

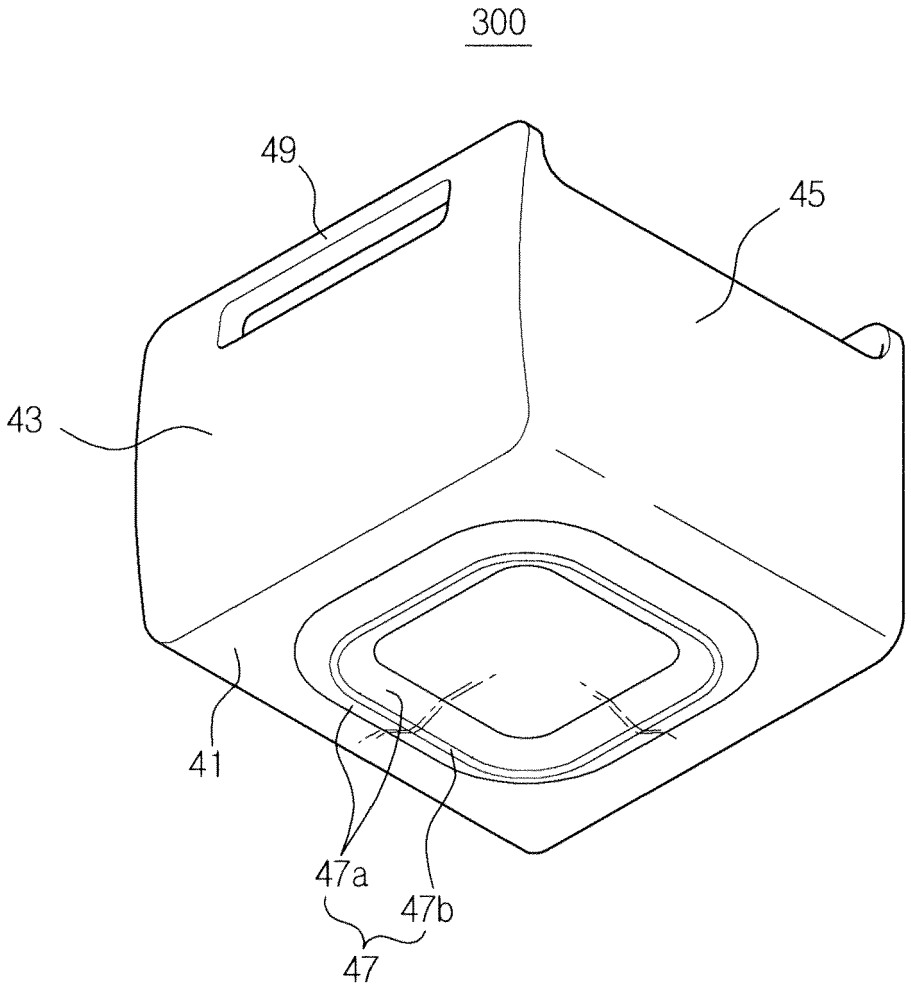

FIG. 4

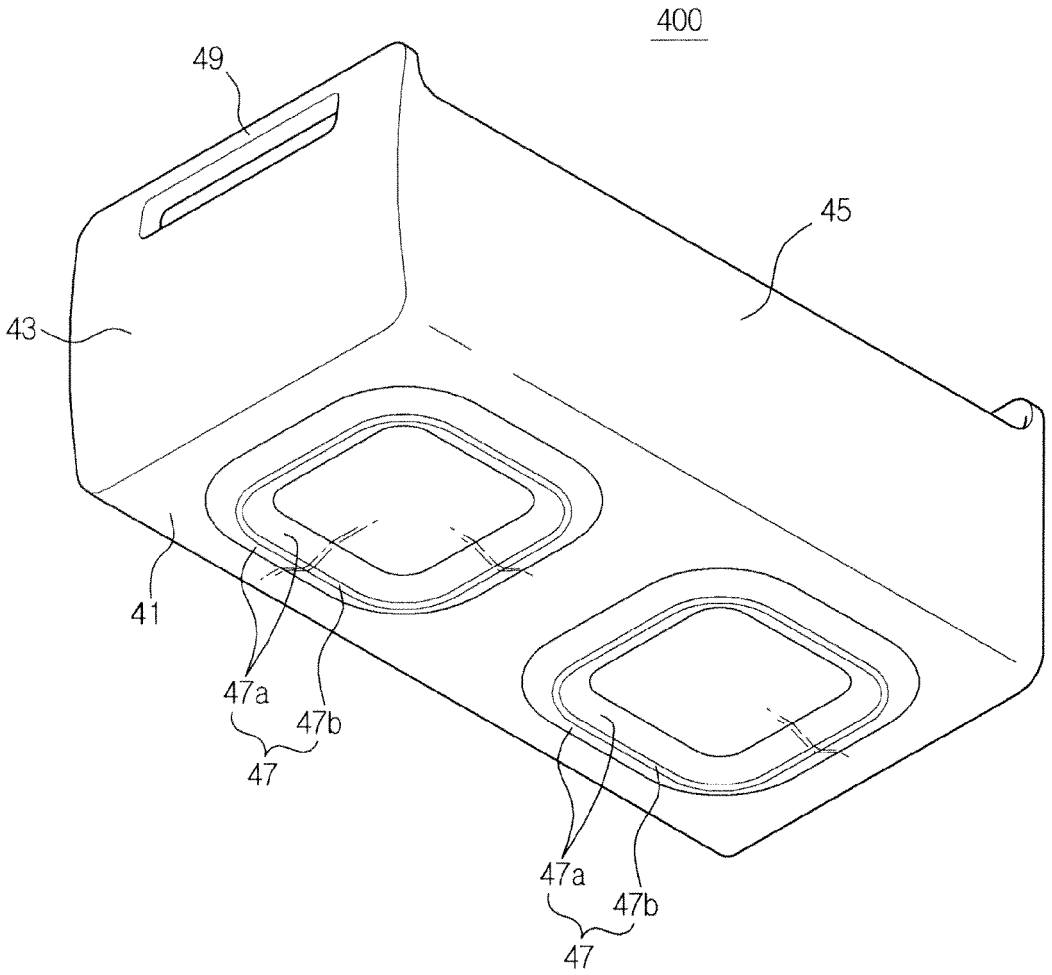

FIG. 5

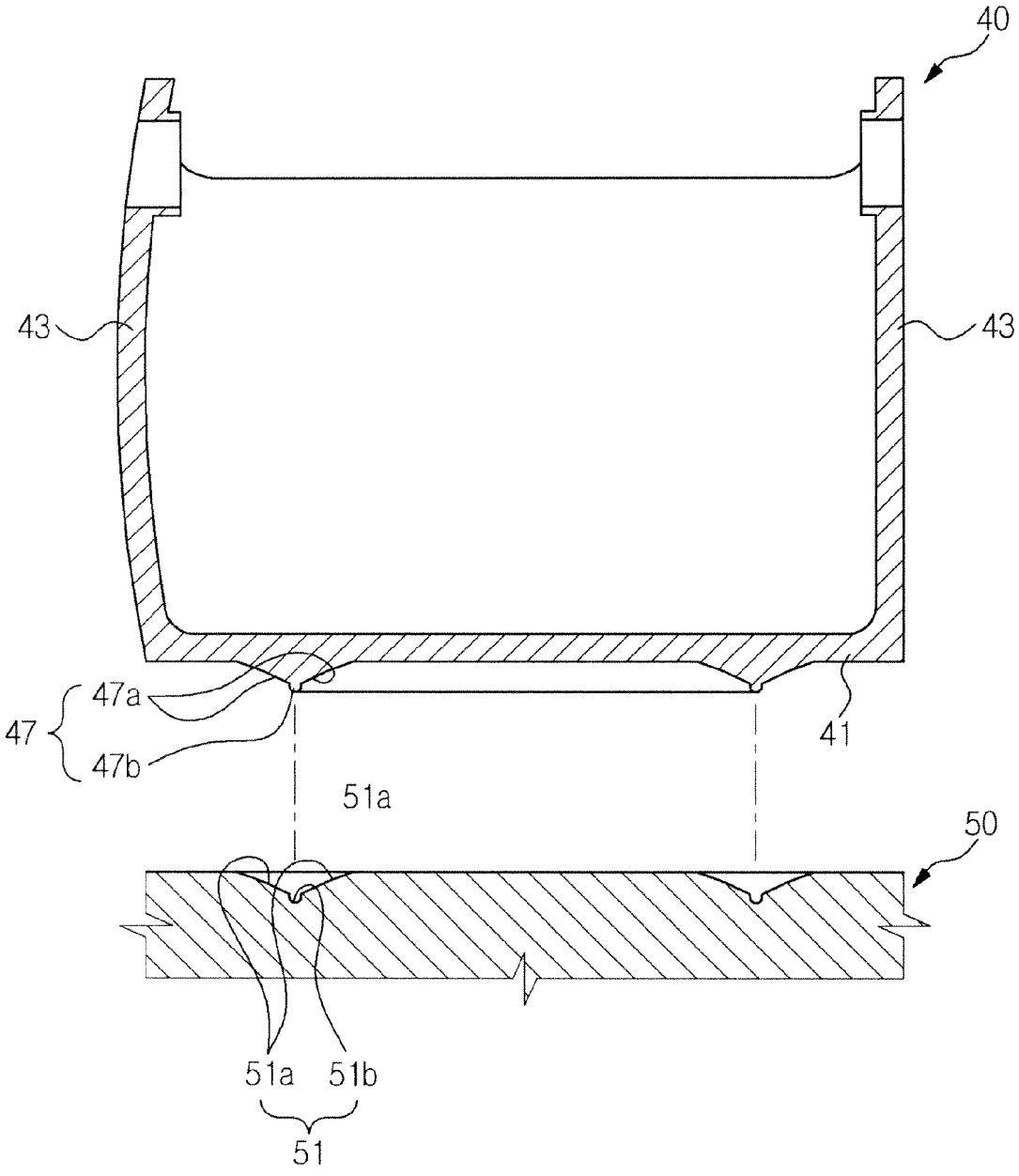

FIG. 6

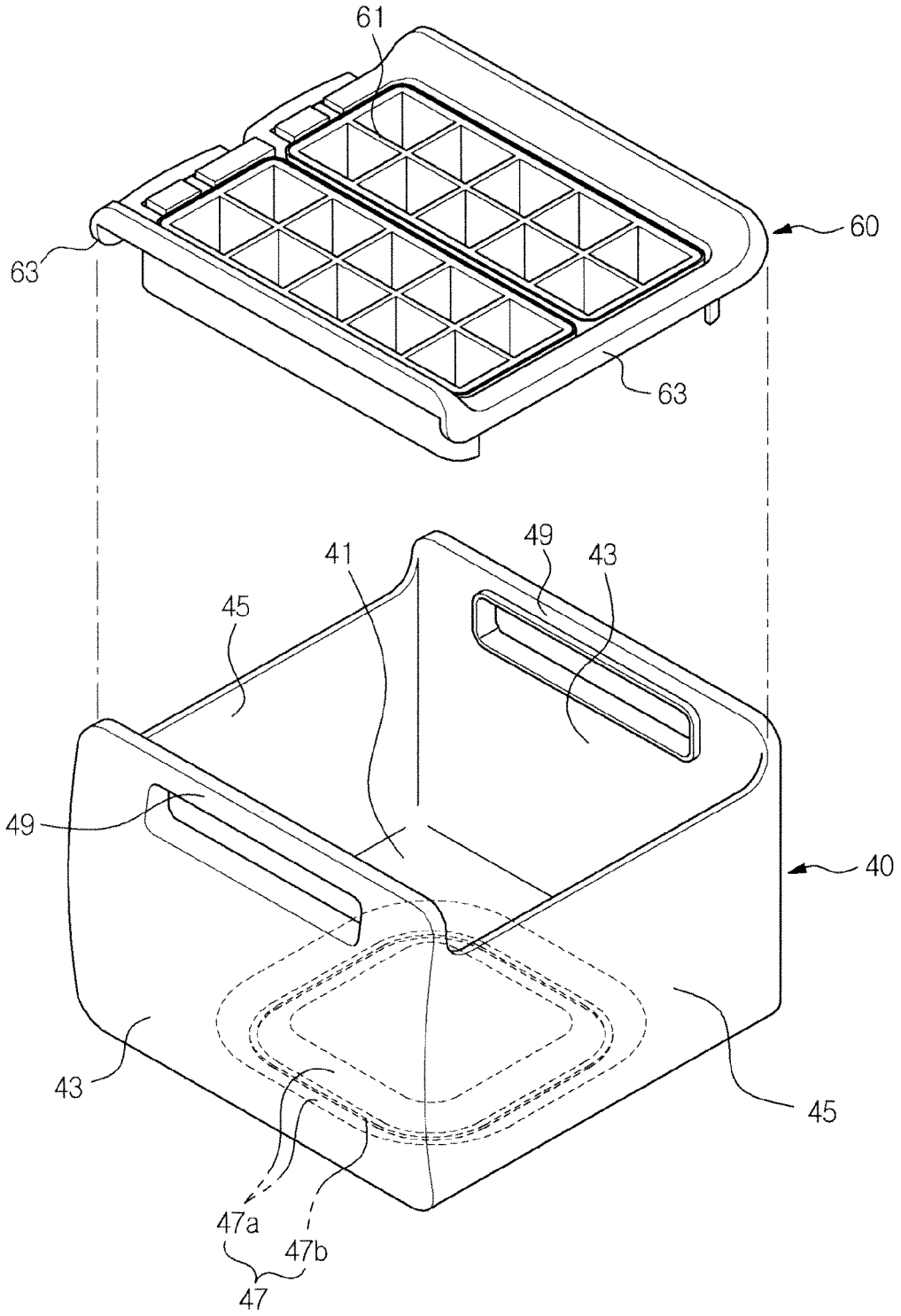

FIG. 7

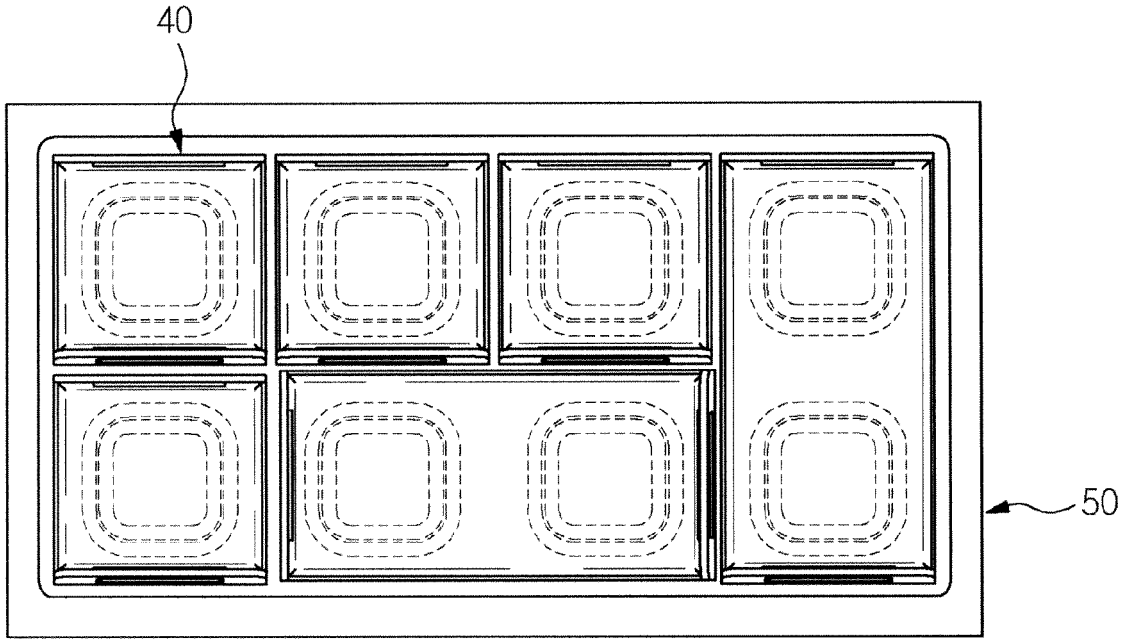

FIG. 8

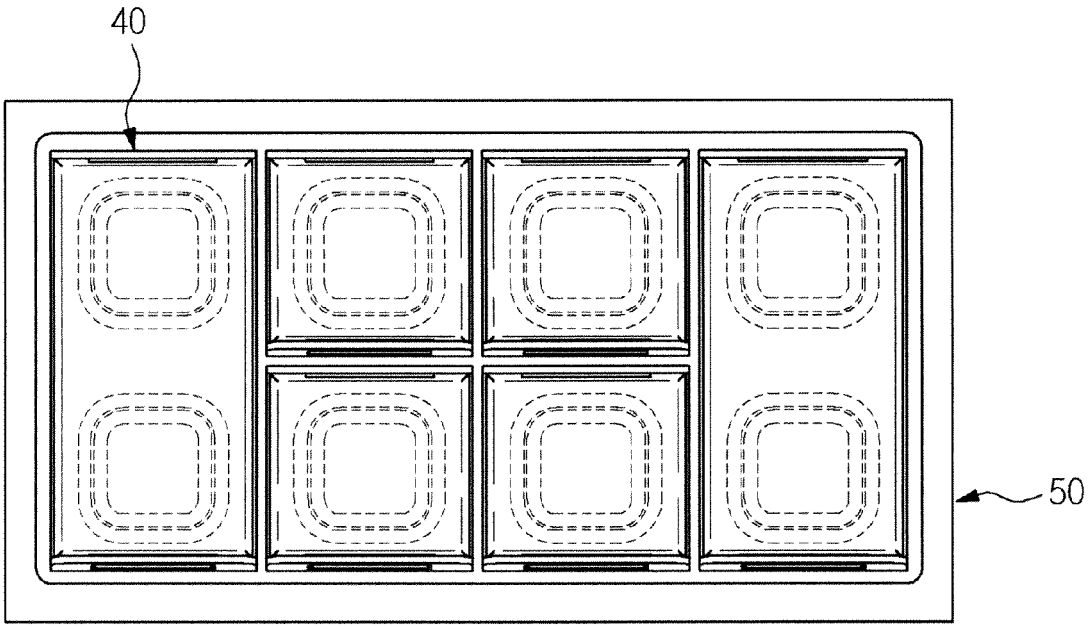

FIG. 9

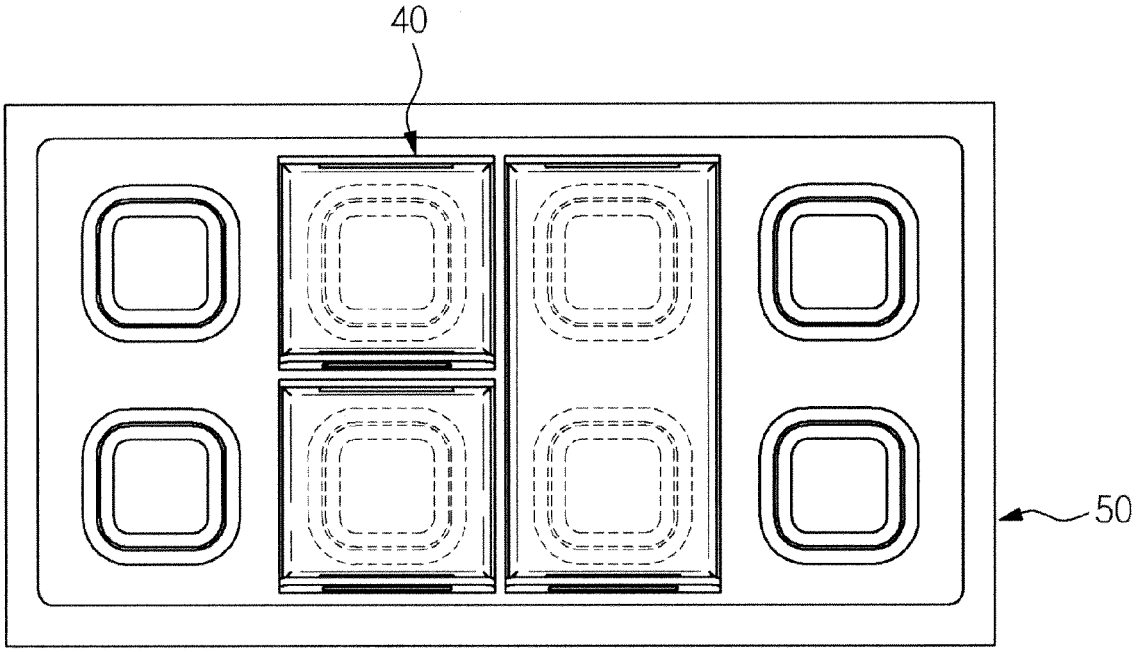

FIG. 10

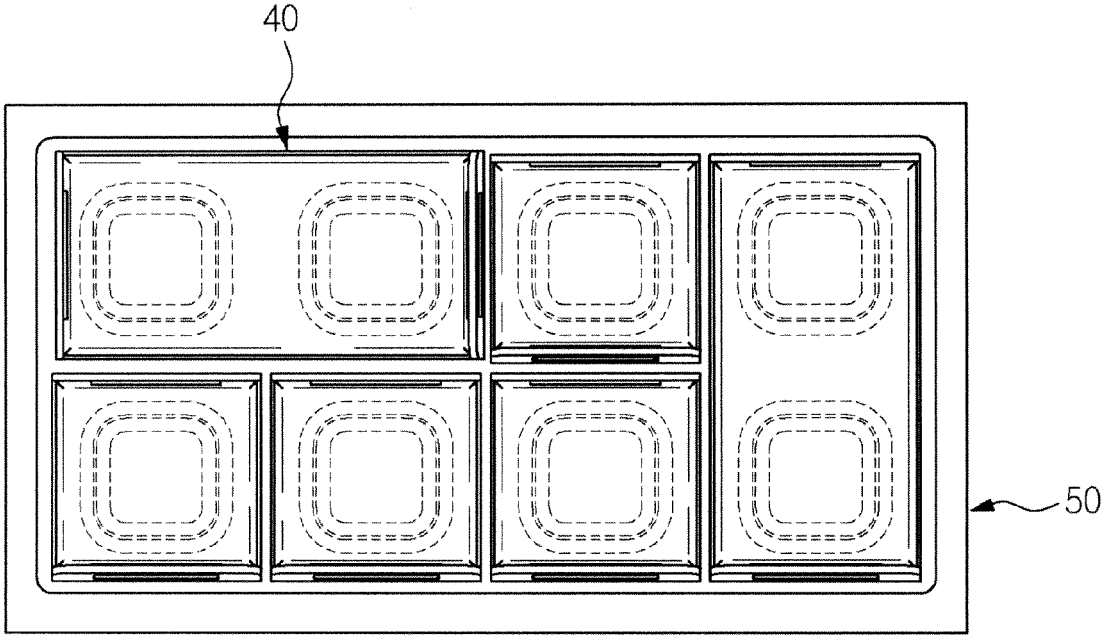

FIG. 11