CLAIMS

[Claim 1]

A refrigerator having a storage compartment that is formed of an internal box and an external box and that includes a rear wall and lateral walls, the refrigerator comprising:

a vacuum heat insulating material arranged between the internal box and the external box corresponding to the rear wall;

convex portions formed at corner portions of the internal box corresponding to the lateral walls and the rear wall, the convex portions projecting toward a front side;

a concave portion formed by lateral surfaces of the convex portions and the internal box corresponding to the rear wall, the concave portion being recessed toward a rear side; and

a cover member mounted to the concave portion for covering at least a part of the concave portion,

wherein the cover member comprises a first member as a cover member and a second member arranged on a rear side of the first member,

the second member is mounted as abutting against the internal box, and

at least a part of the concave portion is covered by the cover member so as to be used as a cooling air passage.

[Claim 2]

A refrigerator having a storage compartment that is formed of an internal box and an external box and that includes a rear wall and lateral walls, the refrigerator comprising:

a vacuum heat insulating material arranged between the internal box and the external box corresponding to the rear wall;

convex portions formed over a substantially entire range in a vertical direction in the storage compartment at corner portions of the internal box corresponding to the lateral walls and the rear wall, the convex portions projecting toward a front side;

a concave portion formed over the substantially entire range in the vertical direction in the storage compartment by lateral surfaces of the convex portions and the internal box corresponding to the rear wall, the concave portion being recessed toward a rear side; and

a cover member mounted to a first mount portion at the concave portion for covering at least a part of the concave portion,

wherein the cover member comprises a first member as a cover member and a second member arranged on a rear side of the first member, and

at least a part of the concave portion is covered by the cover member so as to be used as a cooling air passage.

[Claim 3]

A refrigerator having a storage compartment that is formed of an internal box and an external box and that includes a rear wall and lateral walls, the refrigerator comprising:

a vacuum heat insulating material arranged between the internal box and the external box corresponding to the rear wall;

convex portions formed at corner portions of the internal box corresponding to the lateral walls and the rear wall, the convex portions projecting toward a front side;

a concave portion formed by lateral surfaces of the convex portions and the internal box corresponding to the rear wall, the concave portion being recessed toward a rear side;

a second concave portion formed to the internal box forming the concave portion; and

a cover member mounted to the concave portion for covering the second concave portion,

wherein the cover member comprises a first member as a cover member and a second member arranged on a rear side of the first member, and

the second concave portion is covered by the cover member so as to be used as a cooling air passage.

[Claim 4]

A refrigerator having a storage compartment that is formed of an internal box and an external box and that includes a rear wall and lateral walls, the refrigerator comprising:

a vacuum heat insulating material arranged between the internal box and the external box corresponding to the rear wall;

convex portions formed at corner portions of the internal box corresponding to the lateral walls and the rear wall, the convex portions each having a substantially triangular shape having an oblique side in a horizontal sectional view;

a concave portion formed by the oblique side and the internal box corresponding to the rear wall; and

a cover member mounted to the concave portion for covering at least a part of the concave portion,

wherein the cover member comprises a first member as a cover member and a second member arranged on a rear side of the first member,

the second member is mounted as abutting against the internal box, and

at least a part of the concave portion is covered by the cover member so as to be used as a cooling air passage.

[Claim 5]

A refrigerator having a storage compartment that is formed of an internal box and an external box and that includes a rear wall and lateral walls, the refrigerator comprising:

a vacuum heat insulating material arranged between the internal box corresponding to the rear wall and the external box;

convex portions formed over a substantially entire range in a vertical direction in the storage compartment at corner portions of the internal box corresponding to the lateral walls and the rear wall, the convex portions each having a substantially triangular shape having an oblique side in a horizontal sectional view;

a concave portion formed over the substantially entire range in the vertical direction in the storage compartment by the oblique side and the internal box corresponding to the rear wall; and

a cover member mounted to a first mount portion at the concave portion for covering at least a part of the concave portion,

wherein the cover member comprises a first member as a cover member and a second member arranged on a rear side of the first member, and

at least a part of the concave portion is covered by the cover member so as to be used as a cooling air passage.

[Claim 6]

The refrigerator of any one of claims 1, 3, and 4, further comprising

a first mount portion provided to the internal box at the concave portion for mounting the cover member.

[Claim 7]

The refrigerator of any one of claims 2, 5, and 6,

wherein the first mount portion is formed separately from the internal box.

[Claim 8]

The refrigerator of any one of claims 1 to 3,

wherein the convex portions each have a substantially triangular shape having an oblique side in a horizontal sectional view, and

wherein the concave portion is formed by the oblique side and the rear wall.

[Claim 9]

The refrigerator of any one of claims 1 to 8, further comprising:

a first intermediate member charged or sealed between the internal box and the vacuum heat insulating material to bond, attach, or fix the internal box and the vacuum heat insulating material to each other; and

a second intermediate member other than a foam heat insulating material, the second intermediate member bonding, attaching, or fixing the vacuum heat insulating material with the external box.

[Claim 10]

The refrigerator of claim 9,

wherein the first intermediate member is charged or sealed in a partial range between the internal box and the vacuum heat insulating material at the concave portion.

[Claim 11]

The refrigerator of claim 9 or 10, further comprising

a charging port arranged at the external box corresponding to the rear wall, the charging port is charged or sealed with the first intermediate member,

wherein the charging port has an inside end portion that is provided in a range of the convex portions.

[Claim 12]

The refrigerator of claim 11,

wherein $Y1 \leq T1 + A$, where T1 represents a thickness of one of the lateral walls, A represents a widthwise length of one of the convex portions, and Y1 represents a distance between an widthwise end portion of the rear wall and an widthwise inside end portion of the charging port.

[Claim 13]

The refrigerator of claim 11 or 12,

wherein the vacuum heat insulating material has a cutout portion that is cut or open at a part facing the charging port so that the vacuum heat insulating material is prevented from interfering with the charging port.

[Claim 14]

The refrigerator of any one of claims 11 to 13, further comprising

a machine room provided to a rear surface side of the refrigerator,

wherein the charging port is arranged at four positions near four corners of the rear wall excluding the machine room.

[Claim 15]

The refrigerator of any one of claims 9 to 14,

wherein a ratio of a thickness of the first intermediate member relative to a sum of the thickness of the first intermediate member and a thickness of the vacuum heat insulating material is 0.3 or less.

[Claim 16]

The refrigerator of any one of claims 9 to 15,

wherein the first intermediate member comprises rigid urethane foam, and

wherein the rigid urethane foam has a bending elastic modulus of 15 MPa or more and 150 MPa or less.

[Claim 17]

The refrigerator of claim 3,

wherein the second concave portion has a groove shape formed over the vertical direction at the concave portion.

[Claim 18]

The refrigerator of claim 3 or 17, further comprising

at least two second convex portions provided in a width direction of the concave portion,

wherein the second concave portion is formed between the at least two convex portions.

[Claim 19]

The refrigerator of any one of claims 9 to 16,

wherein the first intermediate member at the concave portion has a thickness of less than 10 mm.

[Claim 20]

The refrigerator of any one of claims 9 to 16 and claim 19,

wherein the vacuum heat insulating material is arranged in a manner of being partially overlapped with the convex portions, and

the vacuum heat insulating material is integrally bonded, attached, or fixed with the internal box, the first intermediate member, and the external box at the convex portions.

[Claim 21]

The refrigerator of any one of claims 9 to 16, 19, and 20 further comprising:

a second vacuum heat insulating material arranged between the internal box corresponding to the lateral walls and the external box corresponding to the lateral walls; and

the first intermediate member charged between the second vacuum heat insulating material and the internal box corresponding to the lateral walls,

wherein the second vacuum heat insulating material is arranged in a manner of being partially overlapped with the convex portions, and

the second vacuum heat insulating material is integrally bonded, attached, or fixed with the internal box, the first intermediate member, and the external box at the convex portions.

[Claim 22]

The refrigerator of any one of claims 1 to 21, further comprising:

a refrigerator compartment arranged in an uppermost stage;

a freezer compartment arranged in a lowermost stage; and

a vegetable compartment arranged above the freezer compartment,

wherein the storage compartment comprises the refrigerator compartment.

[Claim 23]

The refrigerator of claim 22,

wherein the refrigerator compartment, the vegetable compartment, and the freezer compartment are partitioned by partition walls, and

wherein the refrigerator further comprises a third vacuum heat insulating material arranged in each of the partition walls.

[Claim 24]

The refrigerator of claim 23, further comprising

an adhesive agent charged in an internal space of each of the partition walls,

wherein the adhesive agent comprises an urethane foam, and

the urethane form has a thickness of less than 10 mm.

[Claim 25]

The refrigerator of any one of claims 22 to 24, further comprising:

a refrigerator compartment cooler; and

a freezer compartment cooler,

wherein the refrigerator compartment cooler is provided on a rear of the refrigerator compartment or the vegetable compartment.

[Claim 26]

The refrigerator of claim 6 or 7,

wherein the cover member includes a second mount portion that is mounted to the first mount portion.

[Claim 27]

The refrigerator of any one of claims 1 to 26,

wherein the cover member is fixed or hold to the concave portion by a screw, a hooking structure, a fitting structure, or a concavo-convex fitting structure.

[Claim 28]

The refrigerator of any one of claims 1 to 27,

wherein the cooling air passage has a cross-sectional shape that is formed in an elliptical shape elongated in a width direction.

[Claim 29]

The refrigerator of any one of claims 1 to 28,

wherein the second member forms an independent air passage.

[Claim 30]

The refrigerator of any one of claims 1 to 29, further comprising:

a door for closing an opening portion formed on a front side of the storage compartment, the door comprising a door outer shell formed of a door frame portion and a door inner plate, and a glass plate member arranged in the door outer shell;

a fourth vacuum heat insulating material arranged in a door internal space formed of the glass plate member and the door outer shell; and

a foam heat insulating material charged, applied, or sealed in the door internal space.

[Claim 31]

The refrigerator of any one of claims 1 to 30, further comprising

a terminal connectable to a mobile phone, a mobile terminal, or a personal computer;

wherein the refrigerator is capable of recharging the mobile phone, the mobile terminal, or the personal computer.

[Claim 32]

The refrigerator of any one of claims 1 to 31, further comprising

a transmitting-and-receiving unit capable of performing transmission and reception to and from an external device,

wherein the transmission and reception of device information about the refrigerator, weather forecast, or disaster information is capable of being performed to and from the external device.