CLAIMS

[Claim 1]

A refrigerator comprising:

a body portion having a storage compartment including a rear wall and lateral walls, the storage compartment being provided with an opening portion formed on a front side;

convex portions formed at corner portions of an internal box corresponding to an inner surface of the lateral walls and an inner surface of the rear wall, the convex portions projecting toward the front side with respect to the inner surface of the rear wall;

a vacuum heat insulating material having a flat plate shape, the vacuum heat insulating material being arranged between the internal box corresponding to the inner surface of the rear wall and an external box corresponding to an outer surface of the rear wall;

a first intermediate member charged or sealed in the convex portions and between the vacuum heat insulating material and the internal box corresponding to the inner surface of the rear wall to bond, attach, or fix the internal box and the vacuum heat insulating material to each other;

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

a concave portion formed by lateral surfaces of the convex portions and the rear wall; and

a cover member for covering at least a part of a rear of the storage compartment; and

a first mount portion provided in the concave portion for mounting the cover member,

wherein the cover member is mounted to the first mount portion and forms an air passage.

[Claim 2]

The refrigerator of claim 1, further comprising

a charging port arranged at the rear wall excluding a machine room that is provide to an upper portion or a lower portion of the rear wall, the charging port is injected with the first intermediate member.

[Claim 3]

A refrigerator comprising:

a body portion having a storage compartment including a rear wall and lateral walls, the storage compartment being provided with an opening portion formed on a front side;

convex portions formed at corner portions of an internal box corresponding to an inner surface of the lateral walls and an inner surface of the rear wall, the convex portions projecting toward the front side with respect to the inner surface of the rear wall;

a vacuum heat insulating material having a flat plate shape, the vacuum heat insulating material being arranged between the internal box corresponding to the inner surface of the rear wall and an external box corresponding to an outer surface of the rear wall;

a first intermediate member charged or sealed in the convex portions and between the vacuum heat insulating material and the internal box corresponding to the inner surface of the rear wall to bond, attach, or fix the internal box and the vacuum heat insulating material to each other;

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

a concave portion formed by lateral surfaces of the convex portions and the rear wall; and

a cover member for covering at least a part of a rear of the storage compartment;

a charging port arranged at near four corners of the rear wall excluding a machine room that is provide to an upper portion or a lower portion of the rear wall, the charging port being injected with the first intermediate member; and

a first mount portion provided in the concave portion for mounting the cover member,

wherein the cover member is mounted to the first mount portion and forms an air passage.

[Claim 4]

The refrigerator of any one of claims 1 to 3,

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

[Claim 5]

The refrigerator of any one of claims 1 to 4, further comprising

an air passage component fixed or hold to the cover member to form the air passage,

wherein the air passage is formed by the air passage component that is fixed or hold to the cover member.

[Claim 6]

The refrigerator of any one of claims 1 to 4, further comprising

an air passage component fixed or hold to the cover member to form the air passage,

wherein the air passage is formed by the cover member, the air passage component, and the internal box that forms the concave portion.

[Claim 7]

The refrigerator of any one of claims 1 to 6,

wherein the cover member forms at least a part of the air passage or covers at least the part of the air passage.

[Claim 8]

The refrigerator of any one of claims 1 to 7,

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

[Claim 9]

The refrigerator of any one of claims 1 to 8,

wherein the first mount portion is a protruding portion projecting toward the front side, and

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

[Claim 10]

The refrigerator of any one of claims 1 to 9,

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

[Claim 11]

The refrigerator of any one of claims 1 to 10,

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

[Claim 12]

The refrigerator of claim 2 or 3,

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

wherein the charging port is arranged at a position facing the oblique side.

[Claim 13]

The refrigerator of claim 2 or 3,

wherein the charging port has an widthwise inside end portion that is provided in a range of the convex portions at a same height level with the concave portion.

[Claim 14]

The refrigerator of claim 2 or 3,

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 15]

The refrigerator of any one of claims 1 to 14, further comprising:

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

a foam heat insulating material charged between the second vacuum heat insulating material and the internal box corresponding to the inner surface of the lateral walls.

[Claim 16]

The refrigerator of claim 2 or 3,

wherein the vacuum heat insulating material has a cutout or an opening, the cutout or the opening being formed at a part facing the charging port.

[Claim 17]

The refrigerator of any one of claims 1 to 16,

wherein the first intermediate member at a part facing the vacuum heat insulating material has a thickness of less than 10 mm.

[Claim 18]

The refrigerator of any one of claims 1 to 17, further comprising

a pipe forming a refrigeration cycle, the pipe being arranged at the convex portions.

[Claim 19]

The refrigerator of any one of claims 1 to 18, further comprising

control lead wires or electric power supply lead wires arranged at the convex portions.

[Claim 20]

The refrigerator of any one of claims 1 to 19,

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 21]

The refrigerator of any one of claims 1 to 20,

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 22]

The refrigerator of claim 15,

wherein the lateral walls each have a thickness of 20 mm or more and 40 mm or less, and

wherein the foam heat insulating material between the second vacuum heat insulating material and the internal box corresponding to the inner surface of the lateral walls has a thickness of less than 10 mm.

[Claim 23]

The refrigerator of any one of claims 1 to 22, further comprising

a door for closing the opening portion formed on the front side of the storage compartment,

wherein the door comprises

a door outer shell formed of a door frame portion and a door inner plate, and

a glass plate member arranged to the door outer shell.

[Claim 24]

The refrigerator of claim 23, further comprising:

a third 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,

wherein the foam heat insulating material between the glass plate member and the third vacuum heat insulating material has a thickness of less than 10 mm.

[Claim 25]

The refrigerator of any one of claims 1 to 24,

wherein the storage compartment comprises a refrigerator compartment and a freezer compartment,

wherein the refrigerator further comprises a refrigerator compartment cooler and a freezer

compartment cooler, and

wherein the refrigerator compartment cooler is provided on a rear of a lower portion of the refrigerator compartment.

[Claim 26]

The refrigerator of any one of claims 1 to 25, further comprising:

a controller configured to perform a control by temperature of the storage compartment; and

a transmitting-and-receiving unit provided to or near to the controller, the transmitting-and-receiving unit performing transmission and reception to and from an external device.

[Claim 27]

The refrigerator of claim 26, further comprising

a door for closing the opening portion formed on the front side of the storage compartment in a freely openable and closable manner,

wherein the body portion or the door is connected to the external device via wireless connection or infrared connection so that information or electric power are enabled to be transmitted to and received from the external device.

[Claim 28]

The refrigerator of any one of claims 1 to 27,

wherein the cover member includes

an air passage cover portion for covering at least a part of the air passage, and

a rear cover portion for covering at least a part of the concave portion.

[Claim 29]

The refrigerator of any one of claims 1 to 28,

wherein the cover member includes a lateral cover portion for covering at least a part of the lateral walls.

[Claim 30]

The refrigerator of any one of claims 1 to 29,

wherein the cover member comprises

a first member having design characteristics, and

a second member arranged on a rear side of the first member.

[Claim 31]

The refrigerator of any one of claims 1 to 30,

wherein the cover member is mounted in a removable manner.

[Claim 32]

The refrigerator of any one of claims 1 to 31,

wherein the vacuum heat insulating material is arranged in a manner of being partially overlapped with the convex portions, and is integrally formed with the external box and the internal box at the convex portions.