CLAIMS

[Claim 1]

A refrigerator comprising an operation display,

the operation display including

a transparent plate member,

a multilayer sheet disposed on a rear side of the transparent plate member and configured to detect at least change in capacitance, and

an electronic substrate disposed on a side of the multilayer sheet opposite to the transparent plate member, the electronic substrate including a plurality of light emitting sources configured to emit light toward the multilayer sheet, and including a controller configured to receive a signal detected by the multilayer sheet as an operation signal and control the plurality of light emitting sources to emit light,

the multilayer sheet including

a transparent base material,

a plurality of transparent conductive members disposed on a surface of the transparent base material facing the transparent plate member and configured to detect change in capacitance,

a light shielding layer disposed on a surface of the transparent base material on a side of the electronic substrate and includes a pattern configured to display a shape of at least one of characters and symbols, and

a light diffusing layer disposed on a surface of the light shielding layer on a side of the electronic substrate and configured to diffuse light emitted from the plurality of light emitting sources.

[Claim 2]

The refrigerator of claim 1, further comprising a shielding wall disposed between the plurality of light emitting sources.

[Claim 3]

The refrigerator of claim 1 or 2, wherein each of the light shielding layer and at least one of the plurality of transparent conductive members is printed on the transparent base material.

[Claim 4]

The refrigerator of claim 3, wherein the light diffusing layer is printed on the light shielding layer.

[Claim 5]

The refrigerator of any one of claims 1 to 4, wherein

the multilayer sheet further includes a plurality of conductive wires configured to transmit a signal detected by the plurality of transparent conductive members to the electronic substrate, and

the plurality of conductive wires are arranged parallel to each other.

[Claim 6]

The refrigerator of claim 5, wherein a gap is provided between the transparent plate member and a portion in which the plurality of conductive wires of the multilayer sheet are disposed.

[Claim 7]

The refrigerator of claim 2 or any one of claims 3 to 6 as dependent on claim 2, wherein the shielding wall has a white wall surface.

[Claim 8]

The refrigerator of claim 2 or any one of claims 3 to 7 as dependent on claim 2, wherein the shielding wall is inclined to increase an opening extending from at least one of the plurality of light emitting sources to the transparent plate member.

[Claim 9]

The refrigerator of claim 8, further comprising a support member disposed between the multilayer sheet and the electronic substrate and configured to support the multilayer sheet, wherein

the shielding wall is formed on the support member.

[Claim 10]

The refrigerator of claim 9, wherein

the multilayer sheet includes a strip-shaped section on which a plurality of conductive wires are formed to be connected to the electronic substrate, and

the support member includes a partition plate disposed in a connecting portion between the strip-shaped section and the electronic substrate to protect the strip-shaped section.

[Claim 11]

The refrigerator of claim 9 or 10, wherein the support member includes a light guiding member configured to guide light from the plurality of light emitting sources to the multilayer sheet and an outer shell member configured to support the light guiding member.

CLAIMS

[Claim 1]

A refrigerator comprising an operation display,

the operation display including

a transparent plate member,

a multilayer sheet disposed on a rear side of the transparent plate member and configured to detect at least change in capacitance, and

an electronic substrate disposed on a side of the multilayer sheet opposite to the transparent plate member, the electronic substrate including a plurality of light emitting sources configured to emit light toward the multilayer sheet, and including a controller configured to receive a signal detected by the multilayer sheet as an operation signal and control the plurality of light emitting sources to emit light,

the multilayer sheet including

a transparent base material,

a plurality of transparent conductive members disposed on a surface of the transparent base material facing the transparent plate member and configured to detect change in capacitance,

a light shielding layer disposed on a surface of the transparent base material on a side of the electronic substrate and includes a pattern configured to display a shape of at least one of characters and symbols, and

a light diffusing layer disposed on a surface of the light shielding layer on a side of the electronic substrate and configured to diffuse light emitted from the plurality of light emitting sources,

the light shielding layer, the light diffusing layer, and the plurality of transparent conductive members being printed on the same transparent base material.

[Claim 2]

The refrigerator of claim 1, further comprising a shielding wall disposed between the plurality of light emitting sources.

[Claim 3]

The refrigerator of claim 1 or 2, wherein

the multilayer sheet further includes a plurality of conductive wires configured to transmit a signal detected by the plurality of transparent conductive members to the electronic substrate, and

the plurality of conductive wires are arranged parallel to each other.

[Claim 4]

The refrigerator of claim 3, wherein a gap is provided between the transparent plate member and a portion in which the plurality of conductive wires of the multilayer sheet are disposed.

[Claim 5]

The refrigerator of claim 2, or claim 3 or 4 as dependent on claim 2, wherein the shielding wall has a white wall surface.

[Claim 6]

The refrigerator of claim 2 or any one of claims 3 to 5 as dependent on claim 2, wherein the shielding wall is inclined to increase an opening extending from at least one of the plurality of light emitting sources to the transparent plate member.

[Claim 7]

The refrigerator of claim 6, further comprising a support member disposed between the multilayer sheet and the electronic substrate and configured to support the multilayer sheet, wherein

the shielding wall is formed on the support member.

[Claim 8]

The refrigerator of claim 7, wherein

the multilayer sheet includes a strip-shaped section on which a plurality of conductive wires are formed to be connected to the electronic substrate, and

the support member includes a partition plate disposed in a connecting portion between the strip-shaped section and the electronic substrate to protect the strip-shaped section.

[Claim 9]

The refrigerator of claim 7 or 8, wherein the support member includes a light guiding member configured to guide light from the plurality of light emitting sources to the multilayer sheet and an outer shell member configured to support the light guiding member.