CLAIMS

1. A washing machine comprising:

a rotary drum that is rotatably driven;

a washing machine housing that accommodates the rotary drum;

an operation display panel that is arranged on an upper part of the washing machine housing and has an opening window;

a liquid crystal panel that is attached to a rear surface side of the operation display panel;

a transparent glass plate that is attached via an elastic body to a rear surface side of a portion where the opening window is disposed in the operation display panel; and

a transparent electrode that is attached to a rear surface of the transparent glass plate.

2. The washing machine of claim 1,

wherein the opening window has a substantially rectangular shape, and

wherein a step difference (H2) between the operation display panel and the transparent glass plate which are formed on a left side and a right side of opening window is configured to be smaller than a step difference (H1) between the operation display panel and the transparent glass plate which are formed on an upper side and a right side of the opening window.

3. The washing machine of claim 1 or 2, further comprising:

a liquid crystal mounting base to which the liquid crystal panel is attached; and

a control board unit that controls the liquid crystal panel and the transparent electrode,

wherein the transparent glass plate is elastically held between the liquid crystal mounting base and the operation display panel via the elastic body, and

wherein the control board unit is attached to a rear surface of the liquid crystal mounting base.

4. The washing machine of claim 3,

wherein the transparent glass plate, the elastic body, the liquid crystal panel, the liquid crystal mounting base, and the control board unit are unitized so as to configure a touch panel unit, and

wherein the touch panel unit is attached to the operation display panel or a rear surface cover which covers the control board unit.

5. The washing machine of claim 3 or 4,

wherein the liquid crystal mounting base is fastened to a rear surface of the operation display panel by using a screw, in the vicinity of the opening window.

6. The washing machine of claim 5,

wherein the liquid crystal mounting base has a first engagement portion which engages with the operation display panel, between fastened portions using the screw.

7. The washing machine of any one of claims 4 to 6, further comprising:

a first opening that is disposed in the rear surface cover;

a first lid that covers the first opening; and

a relay connector that is disposed at a position corresponding to the first opening of the control board unit.

8. The washing machine of any one of claims 4 to 7, further comprising:

a second opening that is disposed in the rear surface cover;

a second lid that covers the second opening; and

a connector for writing a control program which is disposed at a position corresponding to the second opening of the control board unit.

9. The washing machine of any one of claims 3 to 5, further comprising:

a front frame body that is arranged on a front surface side of the washing machine housing,

wherein the liquid crystal mounting base has a first engagement portion which engages with the operation display panel, and a second

engagement portion which engages with front frame body.

10. The washing machine of claim 9, further comprising:

a rear surface cover that covers the control board unit and is attached to the operation display panel,

wherein the rear surface cover has a third engagement portion which engages with the front frame body.

11. The washing machine of any one of claims 1 to 3,

wherein the elastic body is configured so as not to cover a front surface portion of at least one end surface among four end surfaces which are formed between the transparent glass plate and the opening window.

12. The washing machine of claim 11,

wherein an opening is disposed at a position corresponding to an end surface of the transparent glass plate, which is a lower side of elastic body.

13. The washing machine of claim 11 or 12,

wherein a groove is disposed on at least any outer side of right and left sides of the elastic body.

14. The washing machine of any one of claims 11 to 13,

wherein a vertical wall is disposed on at least any one side of upper and lower sides of the operation display panel, and

wherein the vertical wall covers an end surface of the elastic body.

15. The washing machine of any one of claims 1 to 3,

wherein the elastic body has a fourth engagement portion which engages with the liquid crystal mounting base.

16. The washing machine of claim 15,

wherein a notch of the liquid crystal mounting base is disposed at a position corresponding to a side surface of the elastic body.

17. The washing machine of claim 15 or 16,

wherein a vertical wall is disposed on at least one side of upper and

lower sides of the operation display panel, and

wherein the vertical wall covers the fourth engagement portion of the elastic body.

CLAIMS

1. A washing machine comprising:

a rotary drum that is rotatably driven;

a washing machine housing that accommodates the rotary drum;

an operation display panel that is arranged on an upper part of the washing machine housing and has an opening window;

a liquid crystal panel that is attached to a rear surface side of the operation display panel;

a transparent glass plate that is attached via an elastic body to a rear surface side of a portion where the opening window is disposed in the operation display panel;

a transparent electrode that is attached to a rear surface of the transparent glass plate; and

a liquid crystal mounting base to which the liquid crystal panel is attached,

a control board unit that controls the liquid crystal panel and the transparent electrode, and

wherein the transparent electrode is configured to detect a change in electrostatic capacitance when a finger touches the transparent glass plate

wherein the transparent glass plate is elastically held between the liquid crystal mounting base and the operation display panel via the elastic body,

wherein the control board unit is attached to a rear surface of the liquid crystal mounting base,

wherein the liquid crystal mounting base is fastened to a rear surface of the operation display panel by using a screw, in the vicinity of the opening window, and

wherein the liquid crystal mounting base has a first engagement portion which engages with the operation display panel, between fastened portions using the screw.

2. The washing machine of claim 1,

wherein the opening window has a substantially rectangular shape, and

wherein a second step difference (H2) between the operation display panel and the transparent glass plate is configured to be smaller than a first

step difference (H1) between the operation display panel and the transparent glass plate, the first step difference being formed on an upper side and a lower side of the opening window and the second step difference being formed on a left side and a right side of opening window.

3. The washing machine of claim 1,

wherein the transparent glass plate, the elastic body, the liquid crystal panel, the liquid crystal mounting base, and the control board unit are unitized so as to configure a touch panel unit, and

wherein the touch panel unit is attached to the operation display panel or a rear surface cover which covers the control board unit.

4. The washing machine of claim 3, further comprising:

a first opening that is disposed in the rear surface cover;

a first lid that covers the first opening; and

a relay connector that is disposed at a position corresponding to the first opening of the control board unit.

5. The washing machine of claim 3 or 4, further comprising:

a second opening that is disposed in the rear surface cover;

a second lid that covers the second opening; and

a connector for writing a control program which is disposed at a position corresponding to the second opening of the control board unit.

6. The washing machine of any one of claims 3 to 5, further comprising:

a front frame body that is arranged on a front surface side of the washing machine housing,

wherein the liquid crystal mounting base has a first engagement portion which engages with the operation display panel, and a second engagement portion which engages with front frame body.

7. The washing machine of claim 6, further comprising:

the rear surface cover that covers the control board unit and is attached to the operation display panel,

wherein the rear surface cover has a third engagement portion which

engages with the front frame body.

8. The washing machine of claim 1 or 2,

wherein the elastic body is configured so as not to cover a front surface portion of at least one end surface among four end surfaces which are formed between the transparent glass plate and the opening window.

9. The washing machine of claim 8,

wherein an opening is disposed at a position corresponding to an end surface of the transparent glass plate, which is a lower side of elastic body.

10. The washing machine of claim 8 or 9,

wherein a groove is disposed on at least any outer side of right and left sides of the elastic body.

11. The washing machine of any one of claims 8 to 10,

wherein a vertical wall is disposed on at least any one side of upper and lower sides of the operation display panel, and

wherein the vertical wall covers an end surface of the elastic body.

12. The washing machine of claim 1 or 2,

wherein the elastic body has a fourth engagement portion which engages with the liquid crystal mounting base.

13. The washing machine of claim 12,

wherein a notch of the liquid crystal mounting base is disposed at a position corresponding to a side surface of the elastic body.

14. The washing machine of claim 12 or 13,

wherein a vertical wall is disposed on at least one side of upper and lower sides of the operation display panel, and

wherein the vertical wall covers the fourth engagement portion of the elastic body.