

DESCRIPTION

WASHING MACHINE

5 TECHNICAL FIELD

[0001]

The present invention relates to a washing machine for controlling processes such as washing, rinsing, and spin-drying that are performed one after another in a rotating drum.

10

BACKGROUND ART

[0002]

A conventional washing machine of this type has a washing machine body accommodating a washing/spin-drying tub. The washing machine body
15 is formed with a laundry loading port for loading/unloading of laundry into/from the washing/spin-drying tub. The laundry loading port is openably covered by a lid device.

[0003]

The lid device is configured of a lid body and a lid ornament that are
20 joined together by engagement between a locking claw formed on the lid body and an engaging hole formed in the lid ornament (refer to, for example, PTL 1).

[0004]

The joining of the lid body and the lid ornament of the conventional lid device, however, is effected only by the engagement between the locking claw
25 and the engaging hole, so that there are cases where clearance is generated between the lid body and the lid ornament.

Citation List

Patent Literature

[0005]

PTL 1: Unexamined Japanese Patent Publication No. H08-126792

5 SUMMARY OF THE INVENTION

[0006]

To solve the above-described conventional problem, the present invention aims to provide a washing machine capable of suppressing generation of clearance between components configuring a lid device.

10 [0007]

A washing machine according to the present invention includes a washing machine body accommodating a washing/spin-drying tub, and a lid device for openably covering a laundry loading port formed in the washing machine body. The lid device includes a lid body, and a lid ornament which
15 covers the lid body and is fixed to the lid body by a first fixing structure and a second fixing structure. A sidewall of the lid body is disposed inwardly of a sidewall of the lid ornament, and the second fixing structure is provided on an outer surface of the sidewall of the lid body and an inner surface of the sidewall of the lid ornament.

20 [0008]

The washing machine of the present invention can suppress generation of clearance between the components configuring the lid device.

BRIEF DESCRIPTION OF DRAWINGS

25 [0009]

FIG. 1 is a longitudinal sectional view of a washing machine according to a first exemplary embodiment of the present invention.

FIG. 2 is a plan view of a lid device of the washing machine.

FIG. 3 is a side view of the lid device.

FIG. 4 is a sectional view of the lid device, taken along line 4-4 of FIG.

2.

5 FIG. 5 is a sectional view of the lid device, taken along line 5-5 of FIG.

2.

FIG. 6 is a sectional view of the lid device, taken along line 6-6 of FIG.

2.

FIG. 7 is a perspective view of a first fixing structure of the lid device.

10 FIG. 8 is a sectional view of the lid device, taken along line 8-8 of FIG.

2.

FIG. 9 is a perspective view of a first fixing rib of the lid device.

FIG. 10 is a perspective view of a first engaging claw and inhibiting ribs of the lid device.

15 FIG. 11 is a perspective view of a second fixing structure of the lid device.

FIG. 12 is a sectional view of the lid device, taken along line 12-12 of FIG. 2.

20 FIG. 13 is a perspective view of a second engaging claw and a fixing part of the lid device.

FIG. 14 is a perspective view of a second engaging hole and a hook engaging part of the lid device.

DESCRIPTION OF EMBODIMENT

25 [0010]

A washing machine according to a first aspect of the present invention includes a washing machine body accommodating a washing/spin-drying tub,

and a lid device for openably covering a laundry loading port formed in the washing machine body. The lid device includes a lid body, and a lid ornament which covers the lid body and is fixed to the lid body by a first fixing structure and a second fixing structure. A sidewall of the lid body is disposed inwardly of a sidewall of the lid ornament, and the second fixing structure is provided on an outer surface of the sidewall of the lid body and an inner surface of the sidewall of the lid ornament.

[0011]

This configuration can reduce clearance between the components configuring the lid device, thereby reducing impact noise caused by opening/closing of the lid. Moreover, the fixing structures for fixing the components configuring the lid device to each other are structurally concealed from view, thus improving appearance of the lid device.

[0012]

A second aspect of the present invention is particularly directed to the washing machine according to the first aspect of the present invention, the first fixing structure includes a first fixing rib disposed on the lid ornament, a first engaging claw and an inhibiting rib which are disposed on the lid body. The first fixing rib is inserted between the first engaging claw and the inhibiting rib, and the first engaging claw engages in a first engaging hole formed in the first fixing rib.

[0013]

This configuration can reduce clearance between the lid body and the lid ornament.

[0014]

A third aspect of the present invention is particularly directed to the washing machine according to the second aspect of the present invention, the

second fixing structure includes: on the outer surface of the sidewall of the lid body, a second engaging hole formed of a recess or a through hole, and a hook engaging part; and on the inner surface of the sidewall of the lid ornament, a second engaging claw engaging in the second engaging hole, and a hook part
5 disposed near the second engaging claw for engaging with the hook engaging part. The hook part is formed from the sidewall of the lid body toward a lid interior.

[0015]

This configuration can reduce clearance between the lid body and the
10 lid ornament. Moreover, the fixing structure for fixing the components of the lid device to each other is structurally concealed from view, thereby improving the appearance of the lid device.

[0016]

A fourth aspect of the present invention is particularly directed to the
15 washing machine according to the third aspect of the present invention, the inner surface of the sidewall of the lid ornament includes a base part extending perpendicularly to the sidewall of the lid ornament, and a reinforcing rib for connecting the hook part, the base part, and the inner surface of the sidewall of the lid ornament.

20 [0017]

With this configuration, the components of the lid device can be fixed firmly to each other.

[0018]

An exemplary embodiment of the present invention is described
25 hereinafter with reference to FIGS. 1 to 14. It is to be noted that the present invention is not limited to this exemplary embodiment.

[0019]

FIG. 1 is a longitudinal sectional view of a washing machine according to the first exemplary embodiment of the present invention, illustrating an overall configuration of the washing machine. FIG. 2 is a plan view of a lid device of the washing machine. FIG. 3 is a side view of the lid device. FIG. 4 is a sectional view of the lid device, taken along line 4-4 of FIG. 2. FIG. 5 is a sectional view of the lid device, taken along line 5-5 of FIG. 2. FIG. 6 is a sectional view of the lid device, taken along line 6-6 of FIG. 2.

[0020]

As shown in FIG. 1, washing machine body 1 elastically supports water tub 3 via elastic body 7 provided inside washing machine body 1. Inside water tub 3, washing/spin-drying tub 2 is rotatably disposed. On an inner bottom surface of washing/spin-drying tub 2, pulsator 4 is rotatably disposed. Washing/spin-drying tub 2 and pulsator 4 are selectively driven for rotation as driving force of motor 5 used as driving means is transmitted via belt 6.

[0021]

Washing machine body 1 is formed with, at its upper part, laundry loading port 8 for loading/unloading of laundry into/from washing/spin-drying tub 2, and laundry loading port 8 is openably covered with lid device 9.

[0022]

Lid device 9 is configured of front lid part 10 and rear lid part 11. Rear portions of rear lid part 11 are rotatably supported at the upper part of washing machine body 1, while a rear portion of front lid part 10 is rotatably supported at a front portion of rear lid part 11. Front lid part 10 is provided with handle 12 at its upper surface (refer to FIG. 2). It is configured such that a hand is placed on handle 12 to rotate lid device 9 so as to open laundry loading port 8.

[0023]

As shown in FIGS. 2 to 6, rear lid part 11 is configured of lid body 13, lid ornament 14 covering lid body 13 from above, and window 15 that is made of transparent resin material and disposed in a central portion of rear lid part 11. Through window 15, a condition of the laundry inside washing/spin-drying tub 2 can be checked. Lid body 13 and lid ornament 14 are fixed to each other by first fixing structure 16 and second fixing structure 17.

[0024]

As shown in FIG. 3, similarly to rear lid part 11, front lid part 10 is configured of lid handle component 10A and lid handle component ornament 10B covering lid handle component 10A from above. In a manner similar to rear lid part 11, lid handle component 10A and lid handle component ornament 10B are fixed to each other by first fixing structure 16 and second fixing structure 17.

[0025]

A description of first fixing structure 16 will be given with reference to FIGS. 4 to 10. FIG. 7 is a perspective view illustrating a fixed state achieved by first fixing structure 16. FIG. 8 is a sectional view illustrating the fixed state achieved by first fixing structure 16. FIG. 9 is a perspective view of first fixing rib 18 of first fixing structure 16. FIG. 10 is a perspective view of first engaging claw 21 and inhibiting ribs 22 of first fixing structure 16.

[0026]

As shown in FIG. 4 and FIGS. 7 to 9, lid ornament 14 is formed with first fixing rib 18 suspended from a top surface of lid ornament 14. First fixing rib 18 is formed with first engaging hole 19. In the present exemplary embodiment, first engaging hole 19 is formed as a through hole but may be formed as a recess. First fixing rib 18 is formed with reinforcing ribs 20 at a

connection with lid ornament 14.

[0027]

As shown in FIGS. 7, 8 and 10, lid body 13 is formed with first engaging claw 21 for engaging in first engaging hole 19, and the pair of inhibiting ribs 22 slightly spaced away from first engaging claw 21 in left and right directions, respectively in the drawings. Inhibiting ribs 22 are disposed such that inhibiting ribs 22 abut on or are disposed in close proximity to first fixing rib 18 in which first engaging claw 21 engages in first engaging hole 19, thereby inhibiting first engaging claw 21 from being disengaged from first engaging hole 19 when first fixing rib 18 is deformed.

[0028]

With reference to FIGS. 11 to 14, second fixing structure 17 will be described. FIG. 11 is a perspective view illustrating a fixed state achieved by second fixing structure 17. FIG. 12 is a sectional view illustrating the fixed state achieved by second fixing structure 17. FIG. 13 is a perspective view of second engaging claw 25 and fixing part 26 of second fixing structure 17. FIG. 14 is a perspective view of second engaging hole 30 and ribs 32 of second fixing structure 17.

[0029]

As shown in FIGS. 4 to 6, sidewall 23 of lid ornament 14 is formed to cover an exterior of sidewall 24 of lid body 13. As shown in FIGS. 11 to 13, sidewall 23 of lid ornament 14 is formed with second engaging claw 25 and fixing part 26 positioned in proximity of second engaging claw 25. Fixing part 26 has base part 27 extending from sidewall 23 of lid ornament 14 in a direction substantially perpendicular to sidewall 23, hook part 28 formed downward from base part 27 in substantially parallel with sidewall 23 to be spaced away from sidewall 23, and reinforcing rib 29 connecting hook part 28,

base part 27, and sidewall 23.

[0030]

Sidewall 24 of lid body 13 is formed with second engaging hole 30 in which second engaging claw 25 of lid ornament 14 engages, and hook engaging part 31 for engaging with hook part 28. Hook engaging part 31 includes the pair of ribs 32 formed to face each other, notch part 33 formed in sidewall 24 between ribs 32, and support part 35. Support part 35 is formed to extend from one of ribs to the other rib, and opening 34 is formed between the pair of ribs 32 for insertion of hook part 28.

[0031]

A description will be given hereinafter of assembly of lid device 9 of the washing machine having the above configuration.

[0032]

First fixing structure 16 is formed by insertion of first fixing rib 18 formed on lid ornament 14 between first engaging claw 21 and inhibiting ribs 22 of lid body 13, and engagement of first engaging claw 21 formed on lid body 13 in first engaging hole 19 of first fixing rib 18. In this state, inhibiting ribs 22 abut on first fixing rib 18 or face first fixing rib 18 in close proximity to first fixing rib 18, so that even external force applied to lid body 13 and lid ornament 14 does not cause disengagement between first engaging hole 19 of first fixing rib 18 and first engaging claw 21. An interval between an inner surface of sidewall of lid ornament 14 and first fixing rib 18 is set smaller than a sum of a height of first engaging claw 21 and a thickness of lid body 13, so that generation of clearance can be suppressed between lid ornament 14 and lid body 13.

[0033]

Second fixing structure 17 is formed by engagement of second engaging

claw 25 formed on sidewall 23 of lid ornament 14 in second engaging hole 30 formed in sidewall 24 of lid body 13. Moreover, hook part 28 is inserted through opening 34 formed between rib 32 and support part 35, and base part 27 is inserted in notch part 33. Because hook part 28 inserted through opening 34 is locked by sidewall 24, increase in clearance between sidewall 23 of lid ornament 14 and sidewall 24 of lid body 13 can be suppressed. Further, because base part 27 is inserted in notch part 33, misalignment between lid ornament 14 and lid body 13 can be prevented.

[0034]

For prevention of a sink mark on an external surface of lid ornament 14, as shown in FIG. 7, first fixing rib 18 is formed to be thin near the external surface of lid ornament 14.

[0035]

The exemplary embodiment described above has shown the example in which lid body 13 and lid ornament 14 are fixed to each other by first fixing structure 16 and second fixing structure 17. However, the present invention is not limited to this, and lid handle component 10A and lid handle component ornament 10B may be fixed to each other by first fixing structure 16 and second fixing structure 17. An example of a structure of such a case is shown hereinafter.

[0036]

The lid device also has the lid handle component that is pivotally supported at a front portion of the lid body and has a sidewall extending along its outer periphery, and the lid handle component ornament that covers the lid handle component and has a sidewall extending along its outer periphery. The sidewall of the lid handle component is disposed inwardly of the sidewall of the lid handle component ornament, and the second fixing structure is

provided on an outer surface of the sidewall of the lid handle component and an inner surface of the sidewall of the lid handle component ornament.

[0037]

5 This configuration can reduce clearance between the components configuring the lid device, thereby reducing impact noise caused by opening/closing of the lid. Moreover, the fixing structures for fixing the components of the lid device to each other are structurally concealed from view, thus improving appearance of the lid device.

[0038]

10 The first fixing structure may include a first fixing rib disposed on the lid handle component ornament, a first engaging claw and an inhibiting rib which are disposed on the lid handle component. The first fixing rib may be inserted between the first engaging claw and the inhibiting rib, and the first engaging claw may engage in a first engaging hole formed in the first fixing
15 rib.

[0039]

This configuration can reduce clearance between the lid handle component and the lid handle component ornament.

[0040]

20 The second fixing structure may include: on the outer surface of the sidewall of the lid handle component, a second engaging hole formed of a recess or a through hole, and a hook engaging part; and on the inner surface of the sidewall of the lid handle component ornament, a second engaging claw engaging in the second engaging hole, and a hook part disposed near the
25 second engaging claw for engaging with the hook engaging part. The hook part may be formed from the sidewall of the lid handle component toward a lid interior.

[0041]

This configuration can reduce clearance between the lid body and the lid ornament. Moreover, the fixing structure for fixing the components of the lid device to each other is structurally concealed from view, thereby improving
5 the appearance of the lid device.

[0042]

The inner surface of the sidewall of the lid handle component ornament may include a base part extending perpendicularly to the sidewall of the lid handle component ornament, and a reinforcing rib for connecting the hook part,
10 the base part and the inner surface of the sidewall of the lid handle component ornament.

[0043]

With this configuration, the components of the lid device can be fixed firmly to each other.
15

INDUSTRIAL APPLICABILITY

[0044]

As described above, a washing machine according to the present invention can suppress the generation of clearance between components of a
20 lid device. Thus, the present invention can be applied to applications of other washing machines including a drum type washing machine.

REFERENCE MARKS IN THE DRAWINGS

[0045]

- 25
- | | |
|---|-------------------------|
| 1 | washing machine body |
| 2 | washing/spin-drying tub |
| 3 | water tub |

	8	laundry loading port
	9	lid device
	10	front lid part
	11	rear lid part
5	13	lid body
	14	lid ornament
	16	first fixing structure
	17	second fixing structure
	18	first fixing rib
10	19	first engaging hole
	20	reinforcing rib
	21	first engaging claw
	22	inhibiting rib
	23	sidewall
15	24	sidewall
	25	second engaging claw
	26	fixing part
	27	base part
	28	hook part
20	29	reinforcing rib
	30	second engaging hole
	31	hook engaging part
	32	rib
	33	notch part
25	34	opening
	35	support part

CLAIMS

1. A washing machine comprising:

a washing machine body accommodating a washing/spin-drying tub; and

5 a lid device for openably covering a laundry loading port formed in the washing machine body,

wherein the lid device includes a lid body, and a lid ornament which covers the lid body and is fixed to the lid body by a first fixing structure and a second fixing structure,

10 a sidewall of the lid body is disposed inwardly of a sidewall of the lid ornament, and

the second fixing structure is provided on an outer surface of the sidewall of the lid body and an inner surface of the sidewall of the lid ornament.

15

2. The washing machine according to claim 1, wherein

the first fixing structure includes a first fixing rib disposed on the lid ornament, a first engaging claw and an inhibiting rib which are disposed on the lid body,

20 the first fixing rib is inserted between the first engaging claw and the inhibiting rib, and

the first engaging claw engages in a first engaging hole formed in the first fixing rib.

25

3. The washing machine according to claim 2, wherein

the second fixing structure includes:

on the outer surface of the sidewall of the lid body, a second engaging

hole formed of a recess or a through hole, and a hook engaging part; and

on the inner surface of the sidewall of the lid ornament, a second engaging claw engaging in the second engaging hole, and a hook part disposed near the second engaging claw for engaging with the hook engaging part; and

5 the hook part is formed from the sidewall of the lid body toward a lid interior.

4. The washing machine according to claim 3, wherein

10 the inner surface of the sidewall of the lid ornament includes a base part extending perpendicularly to the sidewall of the lid ornament, and

 a reinforcing rib for connecting the hook part, the base part, and the inner surface of the sidewall of the lid ornament.