

DESCRIPTION

Title of Invention: WASHING MACHINE

TECHNICAL FIELD

[0001]

The present invention relates to a washing machine including an outer lid in an upper portion of a washing tub.

BACKGROUND ART

[0002]

In the related art, a washing machine is known which is configured so that an outer lid installed in an upper portion inside a washing tub is folded into two. In this example, the outer lid is divided into two, and a pivot structure is disposed between divided portions of the outer lid (for example, refer to PTL 1).

[0003]

Fig. 5 is a perspective view illustrating an appearance of washing machine 100 in the related art, and Fig. 6 is a perspective view illustrating a state where outer lid 133 of washing machine 100 is open.

[0004]

Outer lid 133 configured to be openable and closeable is arranged in a center portion of exterior cover 132 which covers an upper surface of washing machine body 131. Outer

lid 133 has front lid 134 and rear lid 135. Front lid 134 and rear lid 135 are pivotally supported by shaft support portion 136 so as to have a foldable configuration.

[0005]

Grip portion 137 is configured in a front portion of front lid 134. Grip portion 137 is arranged at a position in front lid 134, which is close to operation display panel 138 in a front upper portion of washing machine body 131.

[0006]

A user can open outer lid 133 by lifting grip portion 137. Specifically, the user lifts grip portion 137 and tilts outer lid 133 rearward. In this manner, the user can open outer lid 133 in a state where front lid 134 and rear lid 135 are bent by shaft support portion 136 (refer to Fig. 6). In this state, the user can load laundry such as clothes or can load detergent into washing and spin-drying tub 139 inside outer lid 133. A state where outer lid 133 is closed is a flat state rather than a state where front lid 134 and rear lid 135 are bent. In this state, one surface is formed.

[0007]

However, according to this configuration of washing machine 100 in the related art, when front lid 134 is folded substantially vertically downward as illustrated in Fig. 6, there is a large gap between front lid 134 and rear lid 135. Consequently, when the user opens and closes outer lid 133,

the user's finger may be pinched by the gap between front lid 134 and rear lid 135, that is, the gap in a bent portion of outer lid 133.

CITATION LIST

Patent Literature

[0008]

[PTL 1] Japanese Patent Unexamined Publication No.
2011-200274

DISCLOSURE OF THE INVENTION

[0009]

The present invention provides a washing machine which can decrease a gap of a bent portion of an outer lid while maintaining appearance quality.

[0010]

A washing machine of the present invention includes a washing machine body, a water tub disposed inside the washing machine body, a washing & spin-drying tub rotatably arranged inside the water tub, an exterior cover disposed in an upper portion of the washing & spin-drying tub, a laundry loading opening disposed in the exterior cover and through which laundry is loaded, and an outer lid that opens and closes the laundry loading opening. In addition, the washing machine includes a grip member disposed in the outer lid, a rotary shaft that rotatably supports the outer lid and the grip member, a rotary shaft supporting portion that supports the rotary shaft

and is disposed in the outer lid, and a contact portion that is disposed on a rear surface of the grip member and comes into contact with the rotary shaft supporting portion.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

Fig. 1 is a view illustrating a cross-sectional configuration when a washing machine according to an embodiment of the present invention is viewed from a side.

Fig. 2 is a view illustrating a state where an outer lid is opened in a washing machine according to an embodiment of the present invention, by using a cross-sectional configuration when viewed from a side.

Fig. 3 is a perspective view illustrating a state where an outer lid is opened in a washing machine according to an embodiment of the present invention.

Fig. 4 is a partial cross-sectional view illustrating a pivot structure between an outer lid and a grip member of a washing machine according to an embodiment of the present invention.

Fig. 5 is a perspective view illustrating appearance of a washing machine in the related art.

Fig. 6 is a perspective view illustrating a state where an outer lid is opened in a washing machine in the related art.

PREFERRED EMBODIMENTS FOR CARRYING OUT THE INVENTION

[0012]

Hereinafter, an embodiment of the present invention will be described with reference to the drawings.

[0013]

For convenience of description, vertical and horizontal directions taken along the drawings will be described, but the present invention is not limited by the directions. In addition, the present invention is not limited to the embodiment.

[0014]

Fig. 1 is a view illustrating a cross-sectional configuration when washing machine 50 according to the embodiment of the present invention is viewed from a side. Fig. 2 is a view illustrating a state where outer lid 28 is opened in washing machine 50, by using a cross-sectional configuration when viewed from the side. Fig. 3 is a perspective view illustrating a state where outer lid 28 is opened in washing machine 50. Fig. 4 is a partial cross-sectional view illustrating a pivot structure between outer lid 28 and grip member 43 of washing machine 50.

[0015]

Washing machine 50 includes washing machine body 20. Base 21 is disposed in a lower portion of washing machine body 20. Outer frame 22 is assembled to base 21. Exterior cover 24 in which laundry loading opening 23 is open is disposed in an upper portion of outer frame 22. Exterior cover 24 is

configured to cover an upper surface of washing machine body 20.

[0016]

Water tub 25 is elastically supported by outer frame 22 inside washing machine body 20. Washing & spin-drying tub 26 is arranged inside water tub 25 so as to be rotatable around an axis in a substantially vertical direction.

[0017]

Rotary wing 27 for agitating laundry is disposed in an inner bottom portion of washing & spin-drying tub 26 so that a rotary shaft thereof is coaxial with washing & spin-drying tub 26. Rotary wing 27 agitates the laundry during a washing step, a rinsing step, and a drying step.

[0018]

Laundry loading opening 23 is located above opening 41 of washing & spin-drying tub 26.

[0019]

Outer lid 28 is disposed in an upper portion of laundry loading opening 23. Outer lid 28 opens and closes laundry loading opening 23.

[0020]

End portion 42 of outer lid 28 is pivotally and rotatably supported by exterior cover 24. Transparent window portion 29 is disposed on an upper surface of outer lid 28. A user can check a condition of the laundry inside washing &

spin-drying tub 26. Visibility can be improved by using a highly transparent material such as glass or plastic as a material for transparent window portion 29.

[0021]

The user opens outer lid 28 so as to load and unload the laundry through laundry loading opening 23. In order to ensure safety for the user, washing machine 50 is configured to be operated when outer lid 28 is closed. A state where outer lid 28 is opened or closed is determined by a lid opening and closing detector.

[0022]

Grip member 43 is disposed in front of outer lid 28. Outer lid 28 and grip member 43 are connected to each other by rotary shaft 45. This configuration allows grip member 43 to be pivotally supported to be rotatable with respect to outer lid 28. In other words, grip member 43 and outer lid 28 are configured to be bendable.

[0023]

Contact portion 47 having a rib shape is formed integrally with grip member 43 on a rear surface of grip member 43. Rotary shaft supporting portion 46 is disposed in outer lid 28 which supports rotary shaft 45. When grip member 43 is bent with respect to outer lid 28, contact portion 47 is configured to come into contact with rotary shaft supporting portion 46. It is possible to decrease a gap of a bent portion

between grip member 43 and outer lid 28 by disposing contact portion 47.

[0024]

Rib 48 is formed integrally with grip member 43 over substantially an entire length of side end portion 43a extending along rotary shaft 45 (refer to Fig. 4). When grip member 43 is bent with respect to outer lid 28, rib 48 is configured to cover rotary shaft 45. That is, rib 48 functions so that a user is less likely to visually recognize a pivot structure including rotary shaft 45. When grip member 43 is bent with respect to outer lid 28, the user is less likely to touch a pivot portion, since rib 48 is provided. Therefore, it is possible to improve safety. According to this configuration, it is possible to decrease a gap of the bent portion of outer lid 28, more specifically, gap R (refer to Fig. 4) between rib 48 and a surface of rotary shaft supporting portion 46 which opposes rib 48. Therefore, the user's finger is less likely to be pinched by gap R.

[0025]

Since rotary shaft 45 is configured to be located between contact portion 47 and rib 48, the user is further less likely to visually recognize the pivot structure including rotary shaft 45. That is, according to this configuration, it is possible to cause the user to be less likely to visually recognize the pivot structure from various angles.

[0026]

Grip member 43 has a structure in which upper grip member 431 and lower grip member 432 are coupled to each other. Both contact portion 47 and rib 48 are disposed in lower grip member 432. Contact portion 47 and rib 48 are disposed to be substantially parallel to each other. According to this configuration, when contact portion 47 and rib 48 are formed with grip member 43, molding work can use a simple structure. Therefore, the molding work of grip member 43 is facilitated, thereby enabling low-cost production.

[0027]

In grip member 43, handle portion 44 which is open upward is disposed between upper grip member 431 and lower grip member 432.

[0028]

In a state where outer lid 28 is closed, the user inserts the user's finger into handle portion 44, pulls handle portion 44 upward, and then pushes handle portion 44 downward so as to open outer lid 28. As illustrated in Figs. 2 and 3, in a state where outer lid 28 of washing machine 50 is opened, end portion 42 is pivotally supported, thereby bringing outer lid 28 into a substantially upright state with respect to washing machine body 20. At this time, grip member 43 is rotated around rotary shaft 45 serving as a rotation center, and contact portion 47 comes into contact with rotary shaft supporting

member 46. This regulates a rotation angle at which grip member 43 is bent. Accordingly, grip member 43 can be held in a substantially horizontal state with respect to washing machine body 20.

[0029]

As described above, according to the present embodiment, a simple configuration can properly regulate the rotation angle between outer lid 28 and grip member 43. Accordingly, it is possible to decrease a gap formed by outer lid 28 and grip member 43, that is, a gap by which a person's finger may be pinched, in the bent portion of outer lid 28. Therefore, it is possible to improve safety.

[0030]

As described above, washing machine 50 according to the present embodiment includes washing machine body 20, water tub 25 disposed inside washing machine body 20, washing & spin-drying tub 26 rotatably arranged inside water tub 25, and exterior cover 24 disposed in the upper portion of washing & spin-drying tub 26. In addition, washing machine 50 includes laundry loading opening 23 disposed in exterior cover 24 and through which laundry is loaded, outer lid 28 that opens and closes laundry loading opening 23, and grip member 43 disposed in outer lid 28. Furthermore, washing machine 50 includes rotary shaft 45 that rotatably supports outer lid 28 and grip member 43, rotary shaft supporting portion 46 that supports

rotary shaft 45 and is disposed in outer lid 28, and contact portion 47 that is disposed on the rear surface of grip member 43 and comes into contact with rotary shaft supporting portion 46.

[0031]

According to this configuration, the simple configuration can properly regulate the rotation angle between outer lid 28 and grip member 43, and can decrease the gap in the bent portion of outer lid 28. Therefore, it is possible to improve safety.

[0032]

Rib 48 which covers rotary shaft 45 is disposed in grip member 43, and rotary shaft 45 is configured to be located between contact portion 47 and rib 48.

[0033]

According to this configuration, the user is less likely to visually recognize the pivot structure, thereby improving appearance quality. Furthermore, when outer lid 28 is opened or closed, the user is less likely to touch the pivot portion. Therefore, it is possible to further improve safety.

[0034]

Furthermore, contact portion 47 and rib 48 are configured to be substantially parallel to each other. This configuration facilitates the molding work of grip member 43. The simple structure and low-cost production can improve safety

and the appearance quality.

[0035]

As described above, according to washing machine 50 of the present embodiment, opening or closing work of outer lid 28 can be facilitated. While the appearance quality is maintained, it is possible to improve safety for the user by decreasing the gap in the bent portion of outer lid 28.

INDUSTRIAL APPLICABILITY

[0036]

As described above, according to the present invention, a special advantageous effect can be obtained in that it is possible to decrease a gap in a bent portion of an outer lid while appearance quality is maintained. Therefore, the present invention can also be usefully applied to a washing machine including the outer lid on an upper portion of a washing tub, more specifically, not only a household washing machine but also a commercial washing machine.

DESCRIPTION OF REFERENCE NUMERALS AND SIGNS

[0037]

- 20 washing machine body
- 21 base
- 22 outer frame
- 23 laundry loading opening
- 24 exterior cover
- 25 water tub

26 washing & spin-drying tub
27 rotary wing
28 outer lid
29 transparent window portion
41 opening
42 end portion
43 grip member
43a side end portion
44 handle portion
45 rotary shaft
46 rotary shaft supporting portion
47 contact portion
48 rib
50 washing machine
431 upper grip member
432 lower grip member

CLAIMS

[Claim 1]

A washing machine comprising:

a washing machine body;

a water tub that is disposed inside the washing machine body;

a washing & spin-drying tub that is rotatably arranged inside the water tub;

an exterior cover that is disposed in an upper portion of the washing & spin-drying tub;

a laundry loading opening that is disposed in the exterior cover and through which laundry is loaded;

an outer lid that opens and closes the laundry loading opening;

a grip member that is disposed in the outer lid;

a rotary shaft that rotatably supports the outer lid and the grip member;

a rotary shaft supporting portion that supports the rotary shaft and is disposed in the outer lid; and

a contact portion that is disposed on a rear surface of the grip member and that comes into contact with the rotary shaft supporting portion.

[Claim 2]

The washing machine of Claim 1,

wherein a rib which covers the rotary shaft is disposed in the grip member, and

wherein the rotary shaft is configured to be located between the contact portion and the rib.

[Claim 3]

The washing machine of Claim 2,

wherein the contact portion and the rib are configured to be substantially parallel to each other.