heater 220 is inserted into bulging part 210 from outside of water tub 200 through opening 230 at a lower part of water tub 200. Since heater 220 is inserted into support member 240 within bulging part 210, heater 220 is stably supported without being moved. When insertion of heater 220 is completed, by tightening a nut that fixes heater 220 and the washing and spin-drying tub, heater 220 is firmly supported and fixed inside bulging part 210.

Meanwhile, when maintenance of heater assembly 211 is performed, heater 220 can be separated from water tub 200 by a method opposite to the above-described mounting operation method. In other words, by loosening the nut and pulling heater 220 out of bulging part 210, heater 220 can be extracted from bulging part 210 and separated from water tub 200.

Citation List

Patent Literature

PTL 1: Japanese Translation of PCT Publication No. 2005-512742

SUMMARY

In an aspect, there is a washing machine comprising a washing machine body;

a water tub supported in an inside of the washing machine body and having a bottom with a drain port; a drain cock unit coupled with the drain port of the water tub; and a heater unit connected to the drain unit, and communicating with an inner bottom of the water tub, wherein the heater unit has a heater container incorporating a heater for heating washing water inside,

an inner wall bottom surface of the heater container is gradually inclined downward toward the drain cock unit, and an inner wall upper surface of the heater container is gradually inclined upward toward the drain cock unit

In the conventional configuration, when maintenance of heater assembly 211 is performed, it is necessary to extract heater 220 from bulging part 210. However, since the washing and spin-drying tub is disposed inside

water tub 200, when heater 220 is inserted from the outside of water tub 200, an inside of water tub 200 cannot be visually recognized. Accordingly, whether heater 220 is certainly attached to support member 240 on an inner bottom surface of water tub 200 cannot be recognized. Further, since heater 220 needs to be inserted into water tub 200 in a state in which a position of support member 240 inside water tub 200 cannot be recognized, there is a possibility that heater 220 is collided with support member 240 and damaged.

Thus, the washing machine having the conventional configuration has

a problem in convenience when maintenance of the hot water generating device (the heater assembly in the above-described conventional technique) is performed.

A washing machine according to the present disclosure includes a washing machine body, a water tub supported in an inside of the washing machine body and having a bottom with a drain port, and a drain cock unit coupled with the drain port of the water tub. Further, the drain cock unit is connected with a heater unit communicating with an inner bottom of the water tub. The heater unit incorporates a heater for heating washing water and includes a water passage communicating with the inner bottom of the water tub. The water passage and the drain cock unit are opened to the heater unit at positions where water temperatures of the washing water are different.

With this configuration, since the heater unit is provided separately from the water tub, state confirmation of an inside of the heater unit and maintenance of the heater unit can be easily performed.

Further, a washing machine relating to the present disclosure includes a washing machine body, a water tub supported in an inside of the washing machine body and having a bottom with a drain port, a drain cock unit coupled with the drain port of the water tub, and a heater unit coupled with the drain cock unit and communicating with an inner bottom of the water tub. Furthermore, the heater unit has a heater container that houses a heater for heating washing water inside, and an inner wall bottom surface of the heater container is gradually inclined downward toward the drain cock unit.

With this configuration, maintenance of the heater unit can be easily performed, and since washing water within the heater container flows to the drain cock unit during drainage, accumulation of the washing water within the heater container or foreign matter during the drainage can be suppressed.

Further, a washing machine relating to the present disclosure includes a washing machine body having an openable inspection opening for inspecting an inside, a water tub supported in an inside of the washing machine body and having a bottom with a drain port, a drain cock unit coupled with the drain port of the water tub, and a heater unit coupled with the drain cock unit and communicating with an inner bottom of the water tub. Further, the heater unit has a heater container having an opening at one end, a heater mounted within the heater container for heating washing water, and a lid body for openably mounting the opening of the heater container. Furthermore, the heater unit is mounted on the bottom of the water tub in a state in which the opening of the heater container is directed to the inspection opening.

With this configuration, by removing the lid body from the heater container, even when the heater container is mounted on an outer bottom of the water tub, a state of an inside of the heater container can be easily recognized, and a state of an inside of a hot water generating device can be easily recognized.

Further, in the arrangement configuration of heater 220 of the conventional washing machine, since support member 240 for reducing radiant heat of heater 220 is fixed to water tub 200 by screw fastening, expansion of water leakage damage from perforation from a screw part caused by melting of water tub 200 may occur.

A washing machine relating to the present disclosure includes a washing machine body, a water tub supported in an inside of the washing machine body and having a bottom with a drain port, a drain cock unit coupled with the drain port of the water tub, and a heater unit coupled with the drain cock unit and communicating with an inner bottom of the water tub. Further, the heater unit has a heater container having an opening at a first end, a

heater mounted within the heater container for heating washing water, and a substantially U-shaped sheet metal member located between the heater container and the heater. Further, a fixed gap is formed on a side surface of the sheet metal member, the sheet metal member is inserted into the heater container from the opening on the first end side of the heater container, and in the heater container, a belt-shaped rib is extended in an insertion direction of the sheet metal member so as to correspond to the gap of the sheet metal member. Furthermore, an end on the first end side of the belt-shaped rib is formed narrower than the gap on the side surface of the sheet metal member, and a second end opposite to the first end of the belt-shaped rib is formed wider than the gap on the side surface of the sheet metal member.

With this configuration, since the sheet metal member can be fixed within the heater container without screw fastening or welding, occurrence of water leakage damage from a screw caused by melting of the heater container can be suppressed.

Further, a washing machine relating to the present disclosure includes a washing machine body, a water tub supported in an inside of the washing machine body and having a bottom with a drain port, and a drain cock unit coupled with the drain port of the water tub. Further, a heater unit coupled with the drain cock unit and communicating with an inner bottom of the water tub and a heater incorporated in the heater unit for heating washing water are included, and the drain port is formed in a substantially elliptical shape.

With this configuration, maintenance of the heater unit can be easily performed, and an area of the drain port can be increased without making large investment on mold. Accordingly, the washing water within the water tub and the heater container can be efficiently circulated at low cost.

CLAIMS

1. A washing machine comprising:

a washing machine body;

a water tub supported in an inside of the washing machine body and having a bottom with a drain port;

a drain cock unit coupled with the drain port of the water tub; and

a heater unit connected to the drain unit, and communicating with an inner bottom of the water tub,

wherein

the heater unit has a heater container incorporating a heater for heating washing water inside,

an inner wall bottom surface of the heater container is gradually inclined downward toward the drain cock unit, and

an inner wall upper surface of the heater container is gradually inclined upward toward the drain cock unit.

2. The washing machine according to claim 1, wherein an inclination angle of the inner wall upper surface and an inclination angle of the inner wall bottom surface of the heater container are substantially identical.