【CLAIMS】

【Claim 1】

A washing machine comprising:

a main body configured to constitute an exterior of the washing machine and has a laundry port therein;

a main door installed in the main body to open and close the laundry port;

a tub installed inside the main body and configured to accommodate water;

an auxiliary door installed in the main door, disposed at an upper portion of the main door, higher than a level of water accommodated in the tub, and capable of being opened and closed separately from the main door;

a door opening and closing sensor detecting opening and closing of the auxiliary door;

a locking device configured to lock or unlock the auxiliary door in a state in which the auxiliary door is closed; and

a controller configured to unlock the auxiliary door when a locking time of the auxiliary door is counted and a predetermined time elapses.

【Claim 2】

The washing machine of claim 1, wherein the locking device comprises:

a locking protrusion installed to be insertable into a locking groove formed in the auxiliary door and locking or unlocking the auxiliary door; and

a barrier that moves depending on opening and closing of the auxiliary door so as to operate the locking protrusion.

【Claim 3】

The washing machine of claim 2, wherein the barrier operates the locking protrusion only in a state in which the auxiliary door is closed, so that locking of the auxiliary door is performed.

【Claim 4】

The washing machine of claim 1, further comprising:

a drum rotatably installed inside the tub and configured to accommodate laundry,

wherein the controller maintains the auxiliary door in an unlocked state during an operation of the washing machine, and when locking conditions of the auxiliary door are detected by a detector, the controller controls a locking operation of the auxiliary door.

【Claim 5】

The washing machine of claim 4, wherein the detector detects a temperature of water accommodated in the tub, and the controller performs a locking operation of the auxiliary door when the detected temperature of water is higher than a first set temperature.

【Claim 6】

The washing machine of claim 4, wherein the detector detects an air temperature inside the tub, and the controller performs a locking operation of the auxiliary door when the detected air temperature is higher than a second set temperature.

【Claim 7】

The washing machine of claim 4, wherein the detector detects a weight of the laundry accommodated in the drum, and the controller performs a locking operation

of the auxiliary door when the detected weight of the laundry is a predetermined weight or more.

【Claim 8】

The washing machine of claim 4, wherein the detector detects the level of water accommodated in the tub, and the controller performs a locking operation of the auxiliary door when the detected level is an overflow level.

【Claim 9】

The washing machine of claim 4, wherein the detector detects dehydration revolutions per minute (RPM) of the drum, and the controller performs a locking operation of the auxiliary door when the detected dehydration RPM is higher than a set RPM.

【Claim 10】

A method of controlling a washing machine including a main body having a laundry port therein, a tub installed inside the main body and accommodating water, a drum rotatably installed inside the tube, a main door installed in the main body to open and close the laundry port, and an auxiliary door installed in the main door, disposed at an upper portion of the main door, higher than a level of water accommodated in the tub, and capable of being opened and closed separately from the main door, the method comprising:

determining whether the auxiliary door is closed;

when the auxiliary door is closed, locking the auxiliary door; and

when a locking time of the auxiliary door is counted and a predetermined time elapses, unlocking the auxiliary door.

【Claim 11】

The method of claim 10, wherein the locking of the auxiliary door comprises:

moving a barrier provided in a locking device due to a locking groove formed in the auxiliary door when the auxiliary door is closed;

protruding a locking protrusion provided in the locking device outwards according to the movement of the barrier; and

inserting the protruding locking protrusion into the locking groove so that the auxiliary door is locked.

【Claim 12】

The method of claim 10, further comprising:

determining whether the auxiliary door is locked; and

controlling the washing machine to start an operation of the washing machine when the auxiliary door is locked.

【Claim 13】

The method of claim 10, further comprising:

determining whether locking conditions of the auxiliary door are detected while the washing machine operates in a state in which the auxiliary door is unlocked; and

when the locking conditions of the auxiliary door are detected, controlling a locking operation of the auxiliary door.

【Claim 14】

The method of claim 13, wherein the locking conditions of the auxiliary door comprise at least one among:

when a temperature of water accommodated in the tub is higher than a first set temperature;

when a temperature of air that flows inside the tub is higher than a second set temperature;

when a weight of laundry accommodated in the drum is a predetermined weight or more;

when the level of water accommodated in the tub is an overflow level; and

when dehydration revolutions per minute (RPM) of the drum is higher than a set RPM.

【Claim 15】

The method of claim 14, wherein the controlling of the locking operation of the auxiliary door comprises, when at least one among the locking conditions of the auxiliary door is detected, locking the auxiliary door.