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(54) **Security means in a household appliance**

(57) Security means in a household appliance comprises an electric switching unit (1) provided with a PTC resistor (11) and a bistable switching spring (12), at a free end of which spring a movable contact (13) is fixed, a blocking slider (2) for blocking a handle (6) of an appliance door and a latch (3), which in a state of the blocked handle (6) projects into a first opening (21) of the blocking slider (2). A protective lifter (4) is placed between the free end of the bistable switching spring (12) and the blocking slider (2) and transversely thereto. In a state of the unblocked handle (6) a tip (41) of the

protective lifter (4) abuts on a lifting elevation (22) of the blocking slider (2) and keeps the free end of the even possibly hot bistable switching spring (12) apart so that the movable contact (13) is separated from a fixed contact (14). In the state of the blocked handle (6) the tip (41) of the protective lifter (4) abuts on an unelevated spot of the blocking slider (2) so that the movable contact (13) fixed at the free end of the bistable switching spring (12) is closed with the fixed contact (14).

The security means in a household appliance according to the invention contributes to a higher security for the user in a simple way.

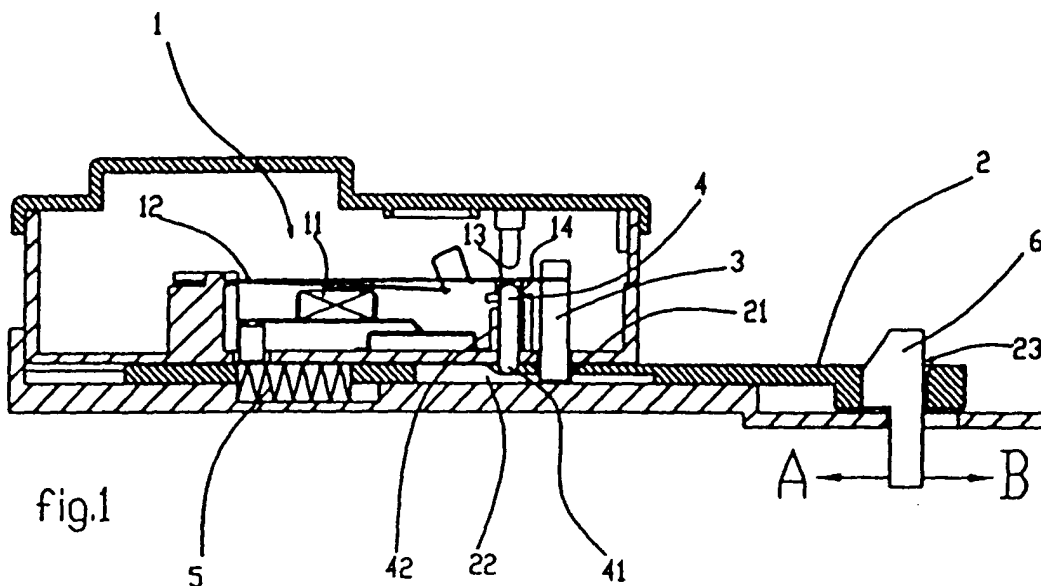


fig.1

Description

[0001] The invention concerns a security means in a household appliance, which security means comprises an electric switching unit provided with a PTC resistor and a bistable switching spring, at a free end of which spring a movable contact is fixed, a blocking slider for blocking a handle of an appliance door and a latch, which is attached to the free end of the bistable switching spring and which in a state of the blocked handle of the appliance door projects into a first opening of the blocking slider, more precisely, however, the invention concerns an improvement of said security means in the sense that the electric circuit through the appliance is interrupted after the handle of the appliance door has been opened by using force during the appliance operation.

[0002] According to International Patent Classification the invention is classified to D 06F 37/28.

[0003] The invention solves the technical problem how to improve, in a simple way, the security means of said kind in a household appliance so that security will be guaranteed to a user even if the handle of the appliance door has been opened by using force during the appliance operation.

[0004] An electric switching unit for a security means in a household appliance is disclosed in the applicant's patent SI 2000 00081 and in the patent EP 1 137 030 originating therefrom. The electric switching unit comprises a PTC resistor, a bimetal strip, a compensating bimetal strip, which compensates the high temperature of the appliance, and a bistable switching spring, which is made up of a strip spring, a hoop spring and a coupling spring. Between the strip spring, by the position of which a jumping over of the hoop spring is determined, and the bimetal strip there is placed the PTC resistor having an electric contact with the strip spring as well with the bimetal strip. After the appliance switch has been activated the PTC resistor is warmed up to 200 °C. The free end of the hoop spring within the bistable switching spring suddenly changes its position. To said free end a latch is attached, which in a state of the blocked handle of the appliance door and of the hot bistable switching spring projects into a first opening of the blocking slider and thus prevents the door handle from being opened. If a force is exerted on the handle of the appliance door during the appliance operation, however, there exists a risk of breaking the latch of the blocking slider and of opening the door although the appliance is still operating.

[0005] According to the invention the said technical problem is solved by a security means in a household appliance having the features cited in first claim.

[0006] The preferred embodiments of the security means according to the invention are characterized by the features from dependent claims.

[0007] The security means in a household appliance according to the invention contributes to a higher secu-

rity for the user in a simple way.

[0008] The invention will now be explained in more detail by way of the description of embodiments and with reference to the accompanying drawing representing in

Fig. 1 a security means according to the invention in a household appliance in a state of a blocked handle of a door and of an electric switch of the appliance being turned on, and

Fig. 2 the security means according to the invention in the household appliance in a state of the unblocked handle of a door.

[0009] A security means of the invention in a household appliance in a state of a blocked handle of an appliance door is represented in Fig. 1. It comprises an electric switching unit 1, a blocking slider 2 for blocking a handle 6 of the appliance door and a latch 3, which in the said state projects into a first opening 21 of the blocking slider 2. In this state the handle 6 of the appliance door passes through a second through hole 23 of blocking slider 2 and pushes it in the direction of an arrow A hereby compressing a spring 5. The electric switching unit 1 is known from said patent SI 2000 00081 and the patent EP 1 137 030 originating therefrom. The electric switching unit comprises inter alia a PTC resistor 11 and a bistable switching spring 12, which is described in said patents and at a free end of which spring a movable contact 13 is fixed. The latch 3 is attached to the free end of the bistable switching spring 12.

[0010] According to the invention a protective lifter 4 is placed between and transversely to the free end of the bistable switching spring 12 and the blocking slider 2.

[0011] The security means of the invention in a household appliance in a state of the unblocked handle 6 of the door is represented in Fig. 2. In this state a tip 41 of the protective lifter 4 abuts on a lifting elevation 22 of the blocking slider 2. In this state the protective lifter 4 keeps the free end of the bistable switching spring 12 apart, so that the movable contact 13 is separated from a fixed contact 14 also in the case when the hot bistable switching spring 12 would otherwise keep them closed.

[0012] In the state of the blocked handle 6 of the appliance door the tip 41 of the protective lifter 4 abuts on an unelevated spot of the blocking slider 2 so that the protective lifter 4 does not prevent a contact of the movable contact 13 with the fixed contact 14.

[0013] The thickness of the blocking slider 2 at the spot, where the tip 41 of the protective lifter 4 abuts on the blocking slider 2 increases in a direction (an arrow A) of a blocking displacement of the blocking slider 2 and it is increased for a height of the lifting elevation 22 within a distance being shorter than a length s of said blocking displacement.

[0014] The protective lifter 4 is movably inserted in a guide piece 42 in the direction of said moving off and closer of the free end of the bistable switching spring 12.

[0015] When locking the handle 6 of the door, the blocking slider 2 moves for said distance s in the direction of the arrow A. At the same time the spring 5 gets compressed. When the user turns on an appliance switch, the PTC resistor 11 warms up and the bistable switching spring 12 pushes the latch 3 into the first opening 21 of the blocking slider 2. Hereby the handle 6 of the door is blocked. During said displacement of the blocking slider 2 in the direction of the arrow A, the rounded off tip 41 of the protective lifter 4 slides across the surface of the blocking slider 2 and in the course of this movement it slides down from the lifting elevation 22 onto an unelevated part of its surface. Hereafter the movable contact 13 can close with the fixed contact 14 and the electric circuit of the appliance closes.

[0016] The unblocking of the handle 6 of the door, however, is only possible when the user turns off the appliance switch. The PTC resistor 11 cools down and the bistable switching spring 12 removes the movable contact 13 from the fixed contact 14 and pulls the latch 3 out of the first opening 21 of the blocking slider 2. Then the spring 5 pushes the blocking slider 2 in the direction of an arrow B. Hereby the handle 6 of the door is unblocked. During said displacement of the blocking slider 2 the rounded-off tip 41 of the protective lifter 4 slides across the surface of the blocking slider 2 and in the course of said movement it climbs the lifting elevation 22.

[0017] If the handle 6 of the door is opened by force the latch 3 breaks above the blocking slider 2. Hereby the displacement of the blocking slider 2 in the direction of the arrow B is made possible, although the PTC resistor 11 still remains hot and the contacts 13 and 14 closed. In such case just the protective lifter 4 breaks off the electric circuit through the appliance. The lifting elevation 22 of the blocking slider 2 namely removes the bistable switching spring 12 so that the movable contact 13 moves away from the fixed contact 14.

Claims

1. Security means in a household appliance, comprising an electric switching unit (1) provided with a PTC resistor (11) and a bistable switching spring (12), at a free end of which spring a movable contact (13) is fixed, a blocking slider (2) for blocking a handle (6) of an appliance door and a latch (3), which is attached to the free end of the bistable switching spring (12) and which in a state of the blocked handle (6) of the appliance door projects into a first opening (21) of the blocking slider (2), **characterized in that** a protective lifter (4) is placed between the free end of the bistable switching spring (12) and the blocking slider (2) and transversely thereto, **that** in a state of the unblocked handle (6) of the appliance door a tip (41) of the protective lifter (4)

abuts on a lifting elevation (22) of the blocking slider (2) and keeps the free end of the even possibly hot bistable switching spring (12) apart so that the movable contact (13) is separated from a fixed contact (14),

that in the state of the blocked handle (6) of the appliance door the tip (41) of the protective lifter (4) abuts on an unelevated spot of the blocking slider (2) so that the movable contact (13) fixed at the free end of the bistable switching spring (12) is closed with the fixed contact (14).

2. Security means in a household appliance as recited in claim 1, **characterized in that** the thickness of the blocking slider (2) at the spot where the tip (41) of the protective lifter (4) abuts on the blocking slider (2) increases in a direction (A) of a blocking displacement of the blocking slider (2) for a height of the lifting elevation (22) within a distance being shorter than a length (s) of said blocking displacement.
3. Security means in a household appliance as recited in claim 2, **characterized in that** the protective lifter (4) is movably inserted in a guide piece (42) in the direction of said moving off and closer of the free end of the bistable switching spring (12).
4. Security means in a household appliance as recited in claim 3, **characterized in that** the tip (41) of the protective lifter (4) abutting on the surface of the blocking slider (2) is rounded off.

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