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(54) **A device for opening the port-hole door of a domestic washing machine**

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Description

This invention is concerned with a push-button device for opening the port-hole shaped door in domestic washing machines.

Several means are already known for opening the port-hole door of domestic washing machines, mainly lever shaped, but also by means of a sliding member.

These approaches may be relatively cost-effective but the aesthetic appearance on the machine doesn't certainly meet one's expectancy, in particular considering the present marketplace requirements.

Port-hole door opening devices have already been provided using a push-button located on the machine control panel, such as according to GB-A-2031053. This approach is certainly an improvement concerning the aesthetic appearance, but it requires a moving slider adapted to connect the push-button device to the latching members, and this largely complicates the construction of the machine, with associated cost drawbacks, besides having a negative influence on the safety required against accidental openings of the port-hole door.

It is an object of this invention to provide a device which, by overcoming known drawbacks of the opening means already known, has all the desired advantages of cost-effectiveness and aesthetic appearance, of course without compromising the required safety levels.

The device according to this invention is characterized by a push-button device, built into the port-hole door latching assembly and mounted on the front wall of the machine, close to said port-hole, between a stop member and an electric assembly of door locking elements, movable perpendicularly to said front wall integrally with an innerly extending body provided with a sloping flat surface adapted to engage a corresponding surface of a known movable slider locking the port-hole door closing latch to said stop member, in order to free said latch for opening said port-hole door, said latch being hingedly mounted on the door peripheral ring.

The subject of this invention will become apparent from the following detailed description of a preferred embodiment thereof, given herein for exemplary but non limiting purposes, reference being made to the attached drawings, wherein:

Figure 1 shows a schematic front view of a domestic washing machine, including the inventive device;

Figure 2 shows a cross sectional view along line II-II of Figure 1; and

Figure 3 shows a view corresponding to that of Figure 2, but with the port-hole door open.

Referring now to the drawings, push button 1 according to this invention is mounted in a built-in arrangement on the latching assembly of port-hole door 5, as it is shown in Figures 2 and 3, in order to be actuated from outside on the machine front wall 7, in a position close to said port-hole 5. As it is shown in Figure 1, the general arrangement obtained is simple and straightforward, as it is presently required in modern machines, where as far as possible an attempt is made to render as unobtrusive as possible the front panel controls, even reducing the number thereof.

As it is already known, port-hole door 5 of a washing machine is kept locked in a closed position, with peripheral rubber ring 9 acting as a seal, through engagement of a latch 4, hinged at one end, onto the metal ring 5a which surrounds port-hole 5. Engagement takes place with a corresponding stop portion in an area 2 of door-latching and -locking, located near port-hole door 5 on the inner side of wall 7. Push button 1 is then located immediately between said latching and locking area 2 and a part 3 including the door-locking electrical components.

It should also be noted, as it is already known in the art, that latch 4 is pushed into engagement with portion 2 by a slider 6 normally kept in a closed position by a pawl (not shown), which is actuated when the machine is switched on. In fact, as it is presently provided in general for washing machines, when port-hole door 5 is closed, and as soon as the machine actuating switch is pressed, thereby starting the washing cycle, the components of door lock 3 are supplied with an electrical voltage and one among them, i.e. a thermistor, rapidly reaches its thermal stabilization temperature thereby heating the bi-metallic couple it is lying upon and whose mechanical distortion causes the electrical closure of a microswitch which in turn supplies power to the electro-mechanical components of the machine. In this way, a mechanical locking of port-hole door 5 is obtained by means of said pawl which stops slider 6. Only after said locking operation has taken place can the washing machine start on its washing program at the end of which, a certain time interval will have to elapse, as determined by the thermal inertia of the bimetal, before the pawl can unlock the slider allowing it to move, for instance in a lever like fashion, in order to free latch 4 and to open the locking arrangement. It should be noted that the same degree of safety concerning the port-hole door locking is obtained also in case of a possible power failure in that thermal inertia keeps the port-hole door safely closed until the washing machine moving members have come to a stop.

According to this invention, once slider 6 has been unlocked by the fact that the washing cycle

termination safety members end their function, it is just necessary to press push-button device 1 all the way inwards, to its position shown in full lines in Figure 3. It carries on its body a sloping flat surface 11 adapted to react against a corresponding sloping surface 11a on slider 6, in order to move the latter towards the unlocking position of latch 4, which gets free from engagement with stop 2, thereby allowing port-hole door 5 to open completely as started and made easier by the spring recovery of seal ring 9 which had been kept compressed while the machine was closed. Meanwhile, push button 1 goes back to its starting position, shown in broken lines in Figure 3, under the biasing action of a quick-return spring 8 provided between the body and the seat of push button 1. It should be noted that a possible actuation of push-button device 1 while the machine is operating, i.e. when the locking microswitch is subjected to a voltage, would not result in any opening effect in that slider 6 would be unable to unlock latch 4, because the former is kept in a closing position by the locking pawl.

Claims

1. An opening device for port-hole door (5) with peripheral ring (5a) of a domestic washing machine including a front wall (7), which comprises the following members mounted there-within close to the port-hole: a push button device (1); a stop member (2) for latching and locking a latch member (4); a movable slider (6) for locking said latch member (4) on said stop member (2) and, in addition, an assembly (3) of door-locking electrical components, characterized by said push-button device (1) being built in into said front wall (7) close to port-hole (5) between said stop member (2) and said electric assembly (3), movable perpendicularly to said front wall (7) integrally with an innerly extending body provided with a sloping flat surface (11) adapted to come into engagement with a corresponding surface (11a) of said moving slider (6) in order to free the latch member (4) for opening port-hole door (5), said latch member (4) being hingedly mounted on said peripheral ring (5a).
2. The device of claim 1, characterized in that said push-button device (1) is provided with a quick return spring (8), whereby it is brought back to the starting position after each operation.

Patentansprüche

1. Aufschliessungsvorrichtung für eine Bullauge-tür (5) mit Umfangsring (5a) einer eine Stirn-wand (7) einschliessenden Haushaltwaschma-schine, die die folgenden dicht am Bullauge innen montierten Bauteile aufweist: eine Druck-knopfvorrichtung (1); einen Anschlagteil (2) zum Klinken und Abschiessen eines Klink-glieds (4); einen beweglichen Gleitschieber (6) zum Abschiessen des genannten Klinkglieds (4) am genannten Anschlagteil (2), und ferner ein Aufbau (3) von türschliessenden elektri-schen Komponenten, dadurch gekennzeichnet, dass die genannte Druckknopfvorrichtung (1) in der genannten Stirnwand (7) dicht am Bullauge (5) zwischen den genannten Anschlagteil (2) und elektrischem Aufbau (3), und senkrecht zur genannten Stirnwand (7) zusammen mit einem nach innen ausstreckenden Körper mit einer ebenen, in Eingriff mit einer entsprechen-den Oberfläche (11a) des genannten bewegli-chen Gleitschiebers (6) zu kommen geeigneten Schrägoberfläche (11) beweglich eingebaut ist, um das Klinkglied (4) zu lösen und die Bullau-getür zu öffnen, wobei das genannte Klinkglied (4) am genannten Umfangsring (5a) klappweise montiert ist.
2. Vorrichtung nach Anspruch 1, dadurch gekenn-zeichnet, dass die genannte Druckknopfvor-richtung (1) mit einer Schnellrückstellfeder (8) versehen ist, wobei sie nach jeder Betätigung zur Ausgangsstellung zurückgebracht wird.

Revendications

1. Dispositif d'ouverture pour une porte à hublot (5) avec collier périphérique (5a) d'une laveuse domestique comportant une paroi avant (7), lequel comprend les éléments suivants montés dans son intérieur près du hublot: un dispositif à poussoir (1); un élément de fixation pour fermer à déclenchement et serrer un élément de blocage (4); un coulisseau mobile (6) pour serrer ledit élément de blocage (4) sur ledit élément de fixation (2), et en outre un ensemble (3) de composants électriques de fermeture de la porte, caractérisé en ce que ledit dispositif à poussoir (1) est incorporé dans ladite paroi avant (7) près du hublot (5) entre ledit élément de fixation (2) et ledit ensemble électrique (3), mobile perpendiculairement à ladite paroi avant (7) de façon solidaire avec un corps se prolongeant à l'intérieur muni d'une surface plate inclinée (11) susceptible de venir en engagement avec une surface correspondante dudit coulisseau mobile (6) afin de déclencher

l'élément de blocage (4) pour ouvrir la porte à hublot (5), ledit élément de blocage étant articulé sur ledit collier périphérique (5a).

2. Dispositif selon la revendication 1, caractérisé en ce que ledit dispositif à poussoir (1) est pourvu d'un ressort à retour rapide (8), par lequel il est ramené en arrière à la position de départ après chaque actionnement.

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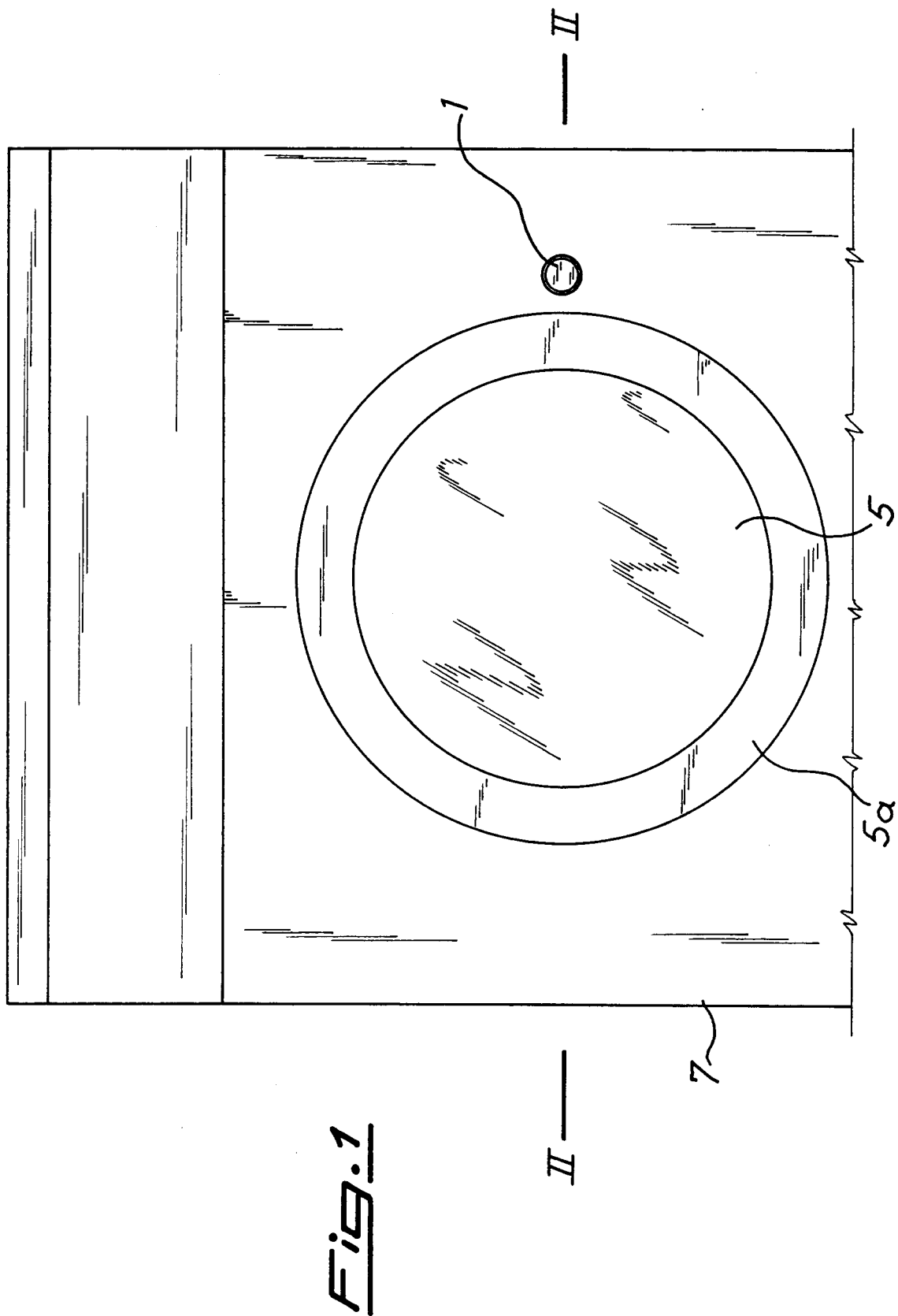


Fig. 2

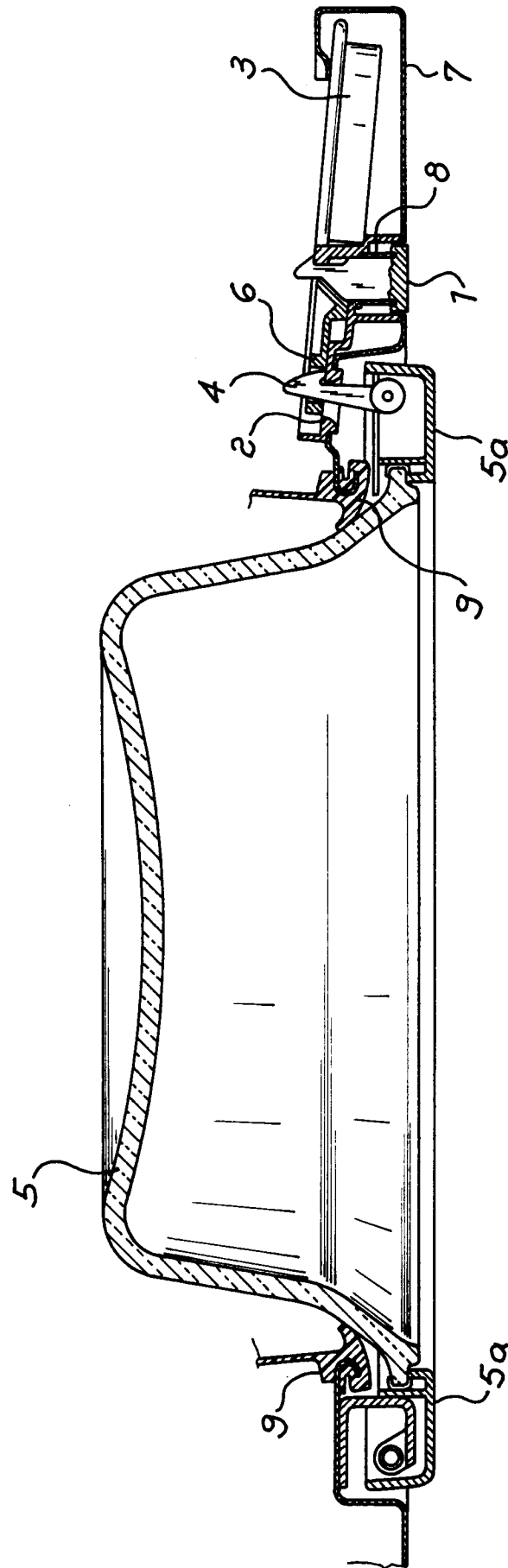


Fig. 3

