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[Continued on next page]

Title: WASHING MACHINE DOOR

Abstract: A washing machine door (1), comprising an inner frame (2), an outer frame (3) and an asymmetrically designed window (4) preferably made of a transparent material; characterized with at least one projection (8) located on the inner frame (2), outer frame (3) or window (4), that provides the 180 degree rotation of the window (4) without separating the inner and outer frames (2 and 3) and with at least one socket (9) wherein said projection (8) is fitted.
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WASHING MACHINE DOOR

The present invention relates to the door of a front-loading type of washing machine with variable opening directions.

The door of the washing machine of the front-loading type, consists of an inner frame, an outer frame and a window sandwiched between the inner and outer frames, which is preferably made of a transparent material, for example of glass that allows the user to view the contents of the drum into which the laundry is loaded; and is attached to the washing machine by means of hinges.

In general, the washing machine door is manufactured so that it can be opened easily by right-handed people. However, such machines are not ergonomical for the left-handed people. Furthermore, the limited space at the opening direction of the door may require a change in its opening direction. In this case, the door mounted on the washing machine so that it can be opened in any direction, is easily dismounted when required, is turned 180° and mounted to the washing machine again. Thus, the washing machine door can be opened also in the opposite direction. Changing the opening direction of the door, leads to alterations in the direction of the connection of the cables used at the door joint as well as in the location of the asymmetrically designed window. Following the change made in the opening direction of the door, the cables are brought to a position that is open to contact with the washing liquid. Also, the position of the asymmetrically designed window, with regard to the machine is changed and its impact on the washing performance is decreased.

In a known embodiment of the prior art, the asymmetrical window has to be rotated 180 degrees and brought to its original position relative to the machine, in order that it satisfies the desired function. The current method comprises the dismounting of said asymmetrical window from its recess between the inner and outer frames and rotating it 180 degrees. For this purpose, the fastening elements
that fix the outer frame to the inner frame have to be unscrewed. These fastening elements are mounted again after the asymmetrical window is rotated 180°. The fastening elements used in such washing machines, such as screws may be worn-out, and the screw threads, tight-fittings and the like may be broken. This situation elongates the service period and risks the general security of the door, and therefore of the washing machine.

The object of the present invention is to provide the simple and easy rotation of the asymmetrical window present on the washing machine door, when its opening direction is required to be changed.

The door realized to attain the object of the present invention has been illustrated in the attached drawings, wherein;

Figure 1, is a three-dimensional view of the washing machine.
Figure 2, is the perspective view from the back, of the front panel and the door.
Figure 3, is the exploded view of the door.
Figure 4, is the cross sectional view of the door and the locking mechanism.
Figure 5, is the front three-dimensional view of the door.
Figure 6, is the rear, three-dimensional view of the door.
Figure 7, is the rear, three-dimensional view of the door comprising a fastening piece and a socket thereof.
Figure 8, is the general three-dimensioned view of the inner part of the lock protector.
Figure 9, is the three-dimensioned view of the hinge.

The component shown in the drawings have been enumerated seperately as follows:
1. Door
2. Inner frame
3. Outer frame
4. Window
5. Recess
6. Hook
7. Hook cover
8. Projection
9. Projection recess
10. Handle
11. Locking mechanism
12. Fastening element
13. Fastening recess
14. Lock protector
15. Cable outlet
16. Fixing projection
17. Lock socket
18. Hinge
19. Front panel
20. Washing machine
21. Extension

The laundry washing and/or drying machine (20) of the front loading type, comprises a door (1) on the front panel (19) through which a user performs the loading/unloading operations of the laundry. The door (1) consists of an inner frame (2), an outer frame (3) and a window (4) preferably made of a transparent material, for instance glass, that is placed between these two frames. The window (4) is designed asymmetrically so that water splashes against it and reaches the laundry in the drum; more effectively. Said window (4) which enhances the washing performance of the machine, is placed between the inner frame (2) and
the outer frame (3) that are preferably in a circular form, in such a manner that it can be moved within said two frames.

There are one or more projections (8) on the inner frame (2) or outer frame (3). The window (4) is provided with recesses (9) wherein said projections (8) are fitted when they are aligned, so that the movement of the window (4) between the inner and outer frames (2,3) is stopped and brought to a stationary position.

In another embodiment of the present invention, the projections (8) are provided on the window (4) and their recesses (9) are on the inner or outer frame (2 or 3).

In one of the preferred embodiments of the present invention, the door (1) comprises one or more locking mechanisms (11) and one or more hinges (18). The form of the hinge (18) is such that it may be used at both sides depending on the desired opening direction of the door (1). Said hinge (18) is provided with extensions (21) that provide the easy mounting of the hinge (18) and the fastening of the hinge while being attached to the front panel (19) by means of screws. The locking mechanism (11) comprises a handle (10); a lock (6) that performs the locking function and which is designed to fit into the locking space provided in the machine cabinet, a hook cover (7) to fix the hook (6) when the door (1), is closed and a lock protector (14) with a structure suitable to the locking mechanism (11). Whereas the lock protector (14) comprises a lock socket (17), one or more fastening projections (16) and one or more cable outlets (15).

A recess (5) on which the hook cover (7) is attached is provided on the inner frame (2). The projection (8) that provides the fixation of the window (4) at a desired position is located adjacent to the said hooks cover (7), whereas two sockets (9) that are symmetrically formed relative to the center of the window are located on the lateral surface of the window (4). The projection (8) is so designed that it can fit into the socket (9) provided on the lateral surface of the window (4).
between the inner and outer frames (2 and 3), when the hook cover (7) is attached to the recess (5).

To change the opening direction of the machine door (1), the door (1) is dismounted from the machine; it is rotated 180 degrees and then remounted on the machine. In order to ensure that the position of the asymmetrically designed window (4) with respect to the machine, remains the same, the hook cover (7) provided on the inner frame (2) and which prevents the rotation of said window (4) by virtue of a projection (8) provided on one of its sides that fits into the socket (9) provided on the window, is removed and the window (4) is rotated 180 degrees between the inner and outer frames (2 and 3). When, another socket (9) provided on the window (4) is aligned with the recess (5) provided on the inner frame (2), the hook cover (7) is attached onto the recess (5) and the projection (8) fits into the socket (9). Upon the fitting of the locking mechanism (11) the lock protector (14) is placed in such a manner that the lock recess (17) is brought on the locking mechanism (11) and the cables from the locking mechanism (11) come out of the cable outlet (15), and is fastened by a fixing projection (16). In this position, the inadvertent rotation of the window (4) between the inner and outer frames (2 and 3) is inhibited and the cables from the locking mechanism (11) are protected against being effected by the washing material.

In another embodiment of the washing machine door (1) according to the present invention, there are preferably two fastening recesses (13) and one or more fastening pieces (12) such as pins, screws, etc. that provide fastening when it is fitted into the fastening recess (13), on the inner frame (2) and/or outer frame (3). Upon the rotation of the window (4), the fastening sockets (13) are aligned with the projection sockets (9) for centering purposes and the window (4) is secured between the inner (2) and outer frames (3) by means of a fastening piece (12).
The present invention provides the use of the window (4) and thus of the door (1) by rotating it 180 degrees without separating the inner and outer frames (2 and 3). This shortens the service time required for changing the opening direction of the door (1). Furthermore, the arisen problems that may occur during the service procedures, such as breaking of the fastening elements, etc. is prevented.
CLAIMS

1. A washing machine door (1), comprising an inner frame (2), an outer frame (3) and an asymmetrically designed window (4) preferably made of a transparent material; characterized with at least one projection (8) located on the inner frame (2), outer frame (3) or window (4), that provides the rotation of the window (4) without separating the inner and outer frames (2 and 3) and with at least one socket (9) wherein said projection (8) is fitted.

2. A washing machine door (1) as defined in Claim 1, characterized with at least two sockets (9) formed on the lateral surface of the window (4) symmetrically with regard to the center of the window (4) and at least one projection (8) that is located on the inner or outer frame (2 or 3).

3. A washing machine door (1) as defined in Claim 1, characterized with at least one socket (9) formed on the lateral surface of the window (4) and at least two projections (8) located on the inner or outer frame (2 or 3).

4. A washing machine door (1) as defined in Claim 1, characterized with at least two projections (8) placed on the lateral surface of the window (4) symmetrically with regard to the center of the window (4) and at least one socket (9) located on the inner or outer frame (2 or 3).

5. A washing machine door (1) as defined in Claim 1, characterized with at least one projection (8) placed on the lateral surface of the window (4) and at least two sockets (9) located on the inner or outer frame (2 or 3).

6. A washing machine door (1) as defined in Claim 1, characterized with a fastening piece (12) that coincides with the sockets (9) when the window (4) is
brought to the desired position during its rotation between the inner and outer frames (2 and 3) and which serves to join the fastening recesses (13) provided on the inner and outer frames (2 and 3) and the sockets (9) together as well as to fixate the window (4).

7. A washing machine door (1) as defined in Claim 1, characterized with a locking mechanism (11) provided on the inner frame (2), comprising a hook (6) that performs the locking function and which is designed to fit into the locking space provided in the machine cabinet, when the door (1) is closed; a recess (5) in which the hook (6) is placed, a hook cover (7) to fix the recess (5) and a projection (8) placed at the side of the hook cover (7) that provides the fixation of the window (4) at the desired position and preferably two sockets (9) that are symmetrically formed relative to the center of the window (4) located on the lateral surface of the window (4).

8. A washing machine door (1) as defined in Claim 1, characterized with a glass asymmetrical window (4).

9. A washing machine door (1) as defined in Claims 1 to 9, characterized with a lock protector (14) comprising a lock socket (17), one or more cable outlets (15) through which the cables come out and one or more fastening projections (16) for its attachment; which provides the orientation and protection of the cables that come out of the locking mechanism (11) when the door (1) is rotated, against the washing material.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 D06F39/14 D06F37/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>GB 2 118 580 A (FAINI SPA) 2 November 1983 (1983-11-02) the whole document</td>
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</tr>
<tr>
<td>A</td>
<td>DE 43 04 009 A (MIELE &amp; CIE) 18 August 1994 (1994-08-18) abstract</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>EP 0 293 984 A (PHILIPS NV) 7 December 1988 (1988-12-07) abstract</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>EP 0 331 643 A (CANDY IND SPA) 6 September 1989 (1989-09-06) abstract</td>
<td>1</td>
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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search

12 November 2002

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20/11/2002

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</table>
| A        | EP 0 844 354 A (BALAY SA)  
abstract | 1                                                                 |
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<th>Publication date</th>
<th>Patent family member(s)</th>
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<tr>
<td>GB 2118580 A</td>
<td>02-11-1983</td>
<td>ES 270989 Y</td>
<td>22-03-1984</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FR 2525250 A3</td>
<td>21-10-1983</td>
</tr>
<tr>
<td>EP 0293984 A</td>
<td>07-12-1988</td>
<td>IT 210393 Z2</td>
<td>30-12-1988</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DE 3867129 D1</td>
<td>06-02-1992</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 0293984 A1</td>
<td>07-12-1988</td>
</tr>
<tr>
<td>EP 0331643 A</td>
<td>06-09-1989</td>
<td>IT 1215979 B</td>
<td>22-02-1990</td>
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<td></td>
<td>EP 0331643 A2</td>
<td>06-09-1989</td>
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