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(54) **Device for opening the front hatch of washing machines.**

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Description

The present invention relates to a device for opening the front hatch of washing machines.

As is known, the hatch of washing machines is usually opened by means of a handle-like device. This device is also adapted to prevent the hatch from opening during the operating cycle of the machine and, vice versa, the operation of the machine while the hatch is open, as prescribed by safety rules.

Due to the usually low position of the hatch, its opening is uncomfortable since it forces the user to bend down. Devices have therefore been proposed which are capable of transferring the hatch opening control to a more adequate position, in particular by means of a pushbutton located in the control keyboard of the machine. (see FR-A-2 552 458)

The pushbutton opening devices adopted are, however, not fully satisfactory, both due to the high effort required to operate them and due to their structural complexity. From EP-A-0174331, whose aim is to solve the problem of providing a bimetal-controlled door bolting device which guarantees an instant bolting and a delayed unbolting of the appliance door, with a simultaneous monitoring of the water level in an appliance, it is also known to use a slideable element, which controls the bolting operation of the device.

The aim of the present invention is to eliminate the above described problem by providing a device which allows to easily open the front hatch of washing machines with a limited actuation force and with a remote control.

Within this aim, a further object of the invention is to provide an opening device which is simple in concept, compact, economically manufactured and reliable in use.

This aim and this object are achieved by a device for opening the front hatch of a washing machine, which comprises a body, a hatch closure hook, an actuating control lever remotely controlled for releasing said hook, and means for opening the hatch in relation to the stopping of the machine, characterized in that said control lever is articulated to said body and has a slot at one end engaging a pin protruding from a slider element slideable in the body and adapted for locking said hook, at the opposite end said lever being provided with a hole for fastening a remote control traction element.

Further characteristics and advantages of the invention will become apparent from the detailed description of a preferred embodiment of the device for opening the front hatch of washing machines, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a partially cutout and sectional side view of the device according to the invention in

hatch opening position;

figure 2 is a similar view of figure 1 of the device in a closing position;

figure 3 is a longitudinal sectional view of the device in opening position;

figure 4 is a similar view of figure 3 of the device in closing position.

With reference to the figures, reference numeral 1 generally indicates the body of the hatch opening device. The body 1 has a flattened portion 2 defined in front of a box-like portion 3 housing the electric controls of means for opening the hatch. Said opening means substantially comprise a pin 4 for locking said device.

Longitudinally to the flattened portion 2 of the body 1 there is a recess 5 constituting the seat for a slider element 6 adapted to engage a conventional hatch closure hook 7, shown in broken lines in figure 2.

The slider 6 has a flattened shape and, as described in greater detail hereinafter, is movable between an idle position and a release position. The idle position is defined by the abutment of the slider edge shoulders 6A on complementarily shaped shoulders 5A of the seat, and the release position is defined by the slider abutting against the bottom 5B of the recess.

The slider 6 furthermore has a longitudinal expansion 6B directed towards the box-like portion 3 and adapted to engage the pin 4. The hook 7, in the locking step, retracts a shaped plate 8 facing the slider 6 and adapted to operate a microswitch. The plate 8 is longitudinally and slideably mounted in the body 1, in an accommodation provided on the box-like portion 3 which extends in said sliding seat of the slider 6, so that said plate 8 protrudes in front of the body 1.

The slider 6 is retained in the recess 5 by means of a cover 9 which is adapted to be fixed on the flattened portion 2 of the body 1. The cover 9 is centrally provided with an opening 10 which cooperates with a corresponding opening provided on the portion 2 to define the engagement seat of said hatch closure hook.

The slider 6 also has a central opening 11 which, in idle position, partially engages said engagement seat, so as to lock the hook 7. The opening 10 and 11 conveniently have beveled edges 10A, 11A for easing the insertion of the hook 7.

The opening 10 is surrounded by an enlarged border 12, on the outer face of the cover 9, while a groove 13 is provided on the inner face and acts as guide for a corresponding enlarged edge 14 of the opening 11 of the slider.

Between the flattened portion 2 of the body 1 and the cover 9, a control lever 15 is articulated and is remotely actuatable for releasing the hatch.

The lever 15 is rotatable on a pivot 16, defined by the cover 9 and surrounded by an annular spacer 17 adapted to provide an interspace which defines the rotation plane of said lever.

On its own rotation plane, the lever has a pair of divergent arms 15A, 15B which are substantially at a right angle to each other. The first arm 15A has, proximate to its end, a slot 18 in which there engages a pin 19 protruding from the slider 6, while the second arm 15B has a hole 20 for fastening a conventional traction element, conveniently connected to a pushbutton for opening the hatch arranged in an easily accessible position. It is also possible to connect the control lever to a pedal or the like.

The lever 15 is rotatable, in contrast with a spring 21 pivoted at pin 22 and acting on the pivot 19 of the slider, between the idle position shown in the figure and a release position.

The rotation of the control lever 15 determines the sliding of the slider 6, so as to cause the release of the hatch closure hook 7. During opening, the disengagement of the slider 6 from the hook 7 determines the return of the shaped plate 8 to its idle position as an effect of the thrust of a spring 23. This release is vice versa prevented if the pin 4 engages the expansion 6B of the slider, as intended during the operation of the machine.

It is apparent that the stroke of the described lever assembly is very limited, with the consequent advantage of having a compact device which also requires a very limited effort to be actuated. The device according to the invention is furthermore particularly simple in construction and assembly.

In the practical embodiment of the invention, the materials employed, as well as the shape and the dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Device for opening the front hatch of a washing machine, which comprises a body (1) defining an engagement seat (5) for a hatch closure hook (7), an actuating control lever (15) remotely controlled for releasing said hook, and means for opening the hatch in relation to the stopping of the machine, characterized in that said control lever (15) is articulated to said body (1) and has a slot (18) at one end engag-

ing a pin (19) protruding from a slider element (6) slideable in the body (1) and adapted for locking said hook, at the opposite end said lever (15) being provided with a hole (20) for fastening a remote control traction element.

2. Device according to claim 1, characterized in that said body (1) has a flattened portion (2) which is longitudinally provided with a recess (5) constituting said sliding seat for said slider, said recess being closed by a cover (9), said control lever (15) being rotatable between said flattened portion and said cover.

3. Device according to claim 2, characterized in that said cover (9) has a central opening (10) which cooperates with a corresponding opening provided on said flattened portion so as to define said engagement seat of the hatch closure hook (7).

4. Device according to claim 1, characterized in that said slider (6) has a central opening (11) which in idle position partially engages said hook engagement seat, so as to lock said hook.

5. Device according to claim 1, characterized in that said slider has a longitudinal expansion which is adapted to engage said opening means.

6. Device according to claim 1, characterized in that it comprises a shaped plate (8) facing said slider (6) and slideably mounted, longitudinally to said body, in an accommodation which extends in said sliding seat of said slider so as to operate a microswitch of said opening means (3), said plate being retracted by said hook in locking the hatch and being returned to its idle position by spring means (23) in opening the hatch.

7. Device according to claim 1, characterized in that said control lever (15) is rotatable between an idle position and a release position in contrast with a spring (21).

Patentansprüche

1. Vorrichtung zum Öffnen der an der Frontseite einer Waschmaschine angebrachten Tür, bestehend aus einem Trägerelement (1) mit einem definierten Sitz (5) für einen Türverriegelungshaken (7), einem betätigbaren Bedienhebel (15), der fernbedienbar ist, um den Türverriegelungshaken (7) zu entriegeln, und Vorrichtungen zum Öffnen der Tür in Relation mit

dem Anhalten der Maschine, **dadurch gekennzeichnet**, daß der Bedienhebel (15) am Trägerelement (1) angelenkt ist und an einem Ende einen Schlitz (18) aufweist, in den ein Bolzen (19) eingreift, der aus einem Schiebeelement (6) hervorsteht, das am Trägerelement (1) schiebbar und zur Verriegelung des Hakens (7) vorgesehen ist, und daß der Bedienhebel (15) am entgegengesetzten Ende ein Loch (2) zur Anbringung eines mechanisch fernbedienbaren Zügelementes aufweist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Trägerelement (1) ein flachgedrücktes Teilstück (2) aufweist, das in Längsrichtung mit einer Ausnehmung (5) zur Aufnahme des Schiebeelementes (6) versehen ist, welche Ausnehmung (5) durch eine Abdeckung (9) geschlossen ist, daß der Bedienhebel (15) drehbar zwischen dem flachgedrückten Teilstück (2) und der Abdeckung (9) gelagert ist.

3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß die Abdeckung (9) eine zentrale Öffnung (10) aufweist, die mit einer entsprechenden Öffnung zusammenwirkt, die in dem flachgedrückten Teilstück (2) vorgesehen ist, um die Sitzaufnahme des Türverriegelungshakens (7) zu bilden.

4. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Schiebeelement (6) eine zentrale Öffnung (11) aufweist, die in Ruhestellung teilweise in die Sitzaufnahme des Hakens eingreift, um den Haken zu verriegeln.

5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Schiebeelement (6) eine Längsausdehnung aufweist, die dazu dient, die Öffnungsvorrichtungen (3) zu betätigen.

6. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß sie eine angepaßte Platine (8) aufweist, die gegenüber dem Schiebeelement (6) und gleitend in Längsrichtung zum Trägerelement (1) derart angeordnet ist, daß sie bis zum Gleitsitz des Schiebeelementes (6) reicht, um einen Mikroschalter der Öffnungsvorrichtungen (3) zu bedienen, daß die Platine (8) durch den Türverriegelungshaken (7) beim Verriegeln desselben zurückgezogen und wieder in ihre Ruhestellung durch Federelemente (23) beim Öffnen der Tür verbracht wird.

7. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der Bedienhebel (15) drehbar zwischen einer Ruhestellung und einer Entrie-

gelungsstellung gegen die Kraft einer Feder (21) gelagert ist.

Revendications

1. Dispositif pour ouvrir la porte frontale d'une machine à laver, qui comprend un corps (1) définissant un logement d'engagement (5) pour un crochet (7) de fermeture de la porte, un levier (15) de commande d'actionnement commandé à distance pour libérer ledit crochet, et des moyens servant à ouvrir la porte en corrélation avec l'arrêt de la machine, caractérisé en ce que ledit levier de commande (15) est articulé sur ledit corps (1) et présente, à une extrémité, une fente (18) qui coopère avec un doigt (19) qui fait saillie sur un coulisseau (6) pouvant coulisser dans le corps (1) et adapté pour verrouiller ledit crochet, cependant qu'à l'extrémité opposée, ledit levier (15) est muni d'un trou (20) servant à la fixation d'un élément de tirage de commande à distance.

2. Dispositif selon la revendication 1, caractérisé en ce que ledit corps (1) possède une portion aplatie (2) qui est munie longitudinalement d'un évidement (5) qui constitue la glissière dudit coulisseau, ledit évidement étant fermé par un couvercle (9), ledit levier de commande (15) tourillonnant entre ladite portion aplatie et ledit couvercle.

3. Dispositif selon la revendication 2, caractérisé en ce que ledit couvercle (9) présente une ouverture centrale (10) qui coopère avec une ouverture correspondante prévue sur ladite portion aplatie de manière à définir ledit logement d'engagement du crochet (7) de fermeture de la porte.

4. Dispositif selon la revendication 1, caractérisé en ce que ledit coulisseau (6) présente une ouverture centrale (11) qui, dans la position de repos, est partiellement engagée dans ledit logement d'engagement du crochet de façon à verrouiller ledit crochet.

5. Dispositif selon la revendication 1, caractérisé en ce que ledit coulisseau présente un prolongement longitudinal adapté pour coopérer avec lesdits moyens d'ouverture.

6. Dispositif selon la revendication 1, caractérisé en ce qu'il comprend une plaque profilée (8) qui regarde vers ledit coulisseau (6) et est montée coulissante dans la direction longitudinale dudit corps, dans un logement qui s'étend dans ladite glissière dudit coulisseau de façon

à actionner un micro-interrupteur desdits moyens d'ouverture (3), ladite plaque étant repoussée par ledit crochet lors du verrouillage de la porte et étant rappelée à sa position de repos par des moyens à ressort (23) lors de l'ouverture de la porte. 5

7. Dispositif selon la revendication 1, caractérisé en ce que ledit levier de commande (15) peut tourner entre une position de repos et une position de libération en antagonisme par rapport à un ressort (21). 10

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