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(54) **Protection against the start of top loaded washing machine with the drum doors opened**

Startschutz einer von oben befüllbaren Waschmaschine bei geöffneten Trommeltüren

Protection contre le démarrage d'une machine à laver à chargement par le haut lorsque les portes du tambour sont ouvertes

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Description

[0001] The invention relates to a top loaded laundry washing machine having a drum for containing the laundry mounted in a tub for rotation about a substantially horizontal axis and in alternate directions during washing, a loading funnel on the tub, a loading funnel lid hingedly connected to an upper edge of the funnel, and being adapted to operate switch means, when closed, to allow the drum to be rotated, a drum door consisting of two door sections located in a cylindrical drum surface, each section opening outwardly of the drum by rotation about a hinge under spring force.

[0002] In a laundry washing machine equipped with doors as described above, the operation of loading with laundry makes it necessary to first open the loading funnel door which gives access to the drum and then to open the drum door. The closing of this door actuates a funnel-door-closed safety contact, thus allowing the drum to rotate. However, there is always a risk of the machine being started without the drum door being positively closed. The drum door comprising two door sections, when the funnel door is brought into its closed position, it will partially close the section of the drum door, often causing the drum to be slightly rotated and, in this case, thus allowing the second door section under the influence of its spring to be lowered to a position near the surface of the drum. As the space between the drum and the loading funnel door is relatively large, nothing will prevent the funnel door from being finally closed and consequently the machine from being started. The door sections having the same length, the free end of the funnel door will bear against the end of a door section, causing a limited rotation of the drum, which allows the second door section to be lowered towards the surface of the drum, as a result of which the funnel door can be closed. The rotation of the drum with open door may cause serious damage to the machine as well as to any laundry which may be jammed between the outer surface of the drum and the wall of the tub.

[0003] Different solutions have been previously worked out to prevent the tub door closing when the drum doors are not closed and so the door open drum rotation when the tub is closed.

[0004] Among these solutions, we can refer to those described in the following documents :

- GB 1 550 869/FR 2318261 concerning a top loaded laundry washing machine characterised in that it is provided with a safety device arranged to oppose the closing of the funnel door when the drum door has not been closed, comprising an abutment member provided on the internal surface of the loading funnel door for engaging the outer edge of a drum door section extending beyond the loading funnel upper edge.

- EP 0 219 422 discloses a top loaded washing machine or dryer with detection of the closing state of the washing drum. The speed of the electric motor driver to rotate the drum is operated by a regulating circuit comparing the real speed of drum rotation with the rated speed in order to correct the speed as a function of the difference between these two values. The speed of the regulation is performed in a closed loop at the end of a predetermined time, if, at this instant, the speed of rotation of the drum is greater than a predetermined threshold (Vo), the supply of electrical power to the drive motor being interrupted at the end of the predetermined time if, at this instant, the speed of rotation of the drum is less than a predetermined threshold. This device does not settle a means to prevent the machine starting when the drum door is stayed opened with the funnel door closed.

[0005] The purpose of the present invention is to provide a solution for the disadvantages described by the safety devices of the top loaded laundry washing machines, appearing in the anterior art, as mentioned above. This invention, as characterised in the claims, has for purpose, on the one hand, to forbid the closing of the loading funnel lid when the drum door is stayed opened, and consequently the start of the top loaded laundry washing machine, of which the drum, with a horizontal axis, is provided with a door consisting of two door sections, having the same length, opening on exterior under the influence of springs, and a detergent box fastened under the loading funnel lid, and, on the other hand, to prevent the drum to be rotated when the door is closed, in using, for that, very simple mechanical means allowing to detect directly the position of the drum door sections before the complete closing of the loading funnel lid in view to start the said washing machine, this without electronic system control.

[0006] The advantages obtained through this invention consist primarily in that it protects the users against the destruction of their washing machines when the drum door is not correctly closed, without risk of failure of an electronic system control, this with the elimination of the obligation of the length of one of the drum door sections able to interfere with its filling and the closing of the said door.

[0007] Other characteristics and advantages will be clearly apparent from the following description of a method of the device according to the invention, applied to a top loaded laundry washing machine, of which the funnel lid is provided with a detergent box supplied with the said safety device, given as a non-limiting example with regard to the appended drawings wherein :

- figure 1 shows a front perspective view of the funnel lid, of which the lid, during its closing, is maintained half-open through the device in action on one of the drum door section stayed opened,

- figure 2 shows a side perspective view of the funnel lid according to figure 1,

- figure 3 shows a below perspective view of the funnel lid, of which the lid, provided with its detergent box, has been closed without be stopped by a drum door section stayed opened,

- figure 4 shows a side view of the door of the funnel lid, provided with a detergent box supplied with the safety device.

[0008] The figures represent the funnel **10** of a top loaded laundry washing machine, provided with a lid **20** supplied with a detergent box **30** having two hooks **31** with nose **32** intended to be supported against the outer edge **41** of a drum door section **40** of the drum door (not represented) in case the drum door is stayed opened, and to fit freely the nose **32** of the hooks **31** under the inferior edge **11** of the funnel **10** when the drum door has been previously closed.

[0009] In examining jointly, in more detail, figures 1 and 2, corresponding to a no starting of the washing cycle following on from a defect in the closing of the drum door, one notices that the nose **32** of the hooks **31** placed in the rear of the detergent box **30,** are be supported against the outer edge **41** of one of the drum door sections **40,** in view to jam this one against the inferior edge **11** of the funnel **10** in forbidding the closing of the lid **20,** and consequently the activation of the starting switch of the washing machine.

[0010] In examining now figure 3, corresponding to a normal use of the washing machine, one notices that, in this case, the lack of drum door section **40** against the inferior edge **11** of the funnel **10** has permitted a free fitting of the nose **32** under the inferior edge **11** of the funnel **10** and consequently the normal closing of the lid **20** to permit the starting of the washing machine.

[0011] Figure **4** shows the position and the shape of the hooks **31** placed in the rear of the detergent box **30,** and consequently in the rear of the lid **20,** so that the nose **32** of the said hooks **31** in closing position be situated a little underneath of the inferior edge **11** of the funnel **10** against which the concerned drum door section **40** leans under its spring force in opening position when the said drum door is stayed opened ; the length of the nose **32** of the hooks **31** being determined in order a sufficient opening angle be let to the lid **20** for oppose it to its closing in case of missing or failing of the drum door ; this, in bearing a sufficient pressure by the hooks **31** with their noses **32** on the edge **41** of the door section **40** concerned to oppose at its driving by the drum, in case a forced closing of the lid **20** be although obtained.

[0012] The using of the device according to the invention is not limited at the example described above, concerning a top loaded laundry machine, when the detergent products are situated in a box fastened on the under surface of the lid, because, in the case the detergent box is incorporated in the funnel, the hooks would be fixed directly on the under surface of the lid, in order they have the same part relating to the drum door, stayed opened inadvertently and having its door sections stayed leaned against the funnel during a attempt to closing of the lid.

[0013] The same remark can be made for top loaded laundry drying machines.

Claims

1. Top loaded laundry washing machine having a drum mounted in a tub for rotation about a horizontal axis and in alternate directions during washing, a loading funnel **(10)** on the tub, a loading funnel lid **(20)** hingedly connected to an upper edge of the funnel, and being adapted to operate switch means, when closed, to allow the drum to be rotated, a drum door consisting of two door sections **(40)** located in a cylindrical drum surface, each door section opening outwardly of the drum by rotation about a hinge under spring force in order to lean against the loading funnel, the said washing machine being provided with a safety device arranged to oppose closing of the lid when the drum door has not been closed, this safety device comprising some abutment members provided on the internal surface of the lid for engaging the outer edge **(41)** of a drum door section when it is opened to oppose the closing of the lid ; the said machine being provided with a detergent box (30), **characterised in that** safety device abutments are constituted by hooks **(31)** formed to obtain, by their noses **(32),** at the same time the pinching and the holding of the outer edge **(41)** of a drum door section **(40)** against the inferior edge **(11)** of the funnel **(10)** in forbidding the closing of the lid **(20),** in case the drum door is stayed opened, and the free fitting of the nose **(32)** of the hooks **(31)** under the inferior edge **(11)** of the funnel **(10)** to permit the complete closing of the lid **(20)** when the drum door has been previously closed.

2. Top loaded laundry washing machine according to claim 1, **characterised in that** when the detergent box **(30)** is fastened against the internal surface of the lid **(20),** the hooks **(31)** of the safety device are connected to the lid **(20)** through the said detergent box **(30)** in the rear of which they are held in order to ensure the same functions than by direct assembling on the lid **(20).**

Patentansprüche

1. Toplader-Wäschewaschmaschine mit einer Trommel, die in einem Laugenbehälter zur Rotation während des Waschens um eine horizontale Achse und in abwechselnden Richtungen montiert ist, ferner mit

einem Einfülltrichter (10) an der Trommel, einen Einfülltrichterdeckel (20), der schwenkbar an einer Oberkante des Trichters angebracht ist und der geeignet ist, Schaltermittel zu bedienen, wenn er geschlossen wird, um das Rotieren der Trommel zu ermöglichen, ferner einer Trommeltür, bestehend aus zwei Türausschnitten (40), die in einer zylindrischen Trommeloberfläche angeordnet sind, wobei sich jeder Türausschnitt mittels einer Drehung um ein Gelenk auswärts von der Trommel öffnet, wobei dieses unter Federspannung steht, um gegen den Einfülltrichter zu drücken, wobei die Waschmaschine mit einer Sicherheitsvorrichtung ausgestattet ist, die so angeordnet ist, dass sie das Schließen des Deckels verhindert, wenn die Trommeltür nicht geschlossen wurde, wobei diese Sicherheitsvorrichtung Anschlagelemente umfasst, die an der Innenoberfläche des Deckels dazu vorgesehen sind, eine Verbindung mit der Außenkante (41) eines Trommeltürausschnitts einzugehen, wenn er geöffnet wird, um das Schließen des Deckels zu verhindern; wobei die Maschine mit einem Waschmittelfach (30) ausgestattet ist; **dadurch gekennzeichnet, dass** die Anschläge der Sicherheitsvorrichtung von Haken (31) gebildet sind, die so geformt sind, dass sie vermöge ihrer Nasen (32) gleichzeitig das Festklemmen und Festhalten der Außenkante (41) eines Trommeltürausschnitts (40) an der Unterkante (11) des Trichters (10) in Verhinderung einer Schließung des Deckels (20) im Falle einer offen gebliebenen Trommeltür bewirken, und ferner **gekennzeichnet durch** die freie Anbringung der Nase (32) der Haken (31) unterhalb der Unterkante (11) des Trichters (10), um ein vollständiges Schließen des Deckels (20) zu erlauben, wenn die Trommeltür zuvor geschlossen worden ist.

2. Toplader-Wäschewaschmaschine gemäß Anspruch 1, **dadurch gekennzeichnet, dass** wenn das Waschmittelfach (30) an der Innenfläche des Deckels (20) befestigt ist, die Haken (31) der Sicherheitsvorrichtung mit dem Deckel (20) durch das Waschmittelfach (30) verbunden sind, an deren Rückseite diese festgehalten werden, um die selben Funktionen wie durch die direkte Anordnung auf dem Deckel (20) zu gewährleisten.

Revendications

1. Machine à laver le linge à chargement par le haut comportant un tambour installé dans une cuve pour la rotation autour d'un axe horizontal et dans des directions alternées durant le lavage, un entonnoir de chargement (10) sur la cuve, un couvercle d'entonnoir de chargement (20) articulé à un bord supérieur de l'entonnoir, et apte à faire fonctionner un moyen de commutation, lorsqu'il est fermé, pour permettre la rotation du tambour, une porte de tambour consistant en deux sections de porte (40) situées dans une surface de tambour cylindrique, chaque section de porte s'ouvrant vers l'extérieur du tambour par la rotation autour d'une charnière sous force élastique pour s'appuyer contre l'entonnoir de chargement, ladite machine à laver étant munie d'un dispositif de sécurité agencé pour s'opposer à la fermeture du couvercle lorsque la porte du tambour n'a pas été fermée, ce dispositif de sécurité comprenant quelques éléments de butée réalisés sur la surface interne du couvercle pour la mise en prise avec un bord extérieur (41) d'une section de porte de tambour lorsqu'elle est ouverte pour s'opposer à la fermeture du couvercle; ladite machine étant munie d'une boite de détergent (30), **caractérisée en ce que** les butées du dispositif de sécurité sont formées par des crochets (31) formés pour obtenir, par leurs ergots (32), en même temps le pincement et la retenue du bord externe (41) de la section de porte de tambour (40) contre le bord inférieur (11) de l'entonnoir (10) en empêchant la fermeture du couvercle (20) dans le cas où la porte de tambour est restée ouverte, l'ajustement libre de l'ergot (32) des crochets (31) sous le bord inférieur (11) de l'entonnoir (10) pour permettre la fermeture complète du couvercle (20) lorsque la porte de tambour a été préalablement fermée.

2. Machine à laver le linge à chargement par le haut selon la revendication 1, **caractérisée en ce que**, lorsque la boîte de détergent (30) est fixée contre la surface interne du couvercle (20), les crochets (31) du dispositif de sécurité sont reliés au couvercle (20) par ladite boite de détergent (30) dans l'arrière de laquelle ils sont retenus pour assurer les mêmes fonctions que par assemblage direct sur le couvercle (20).

FIG.1

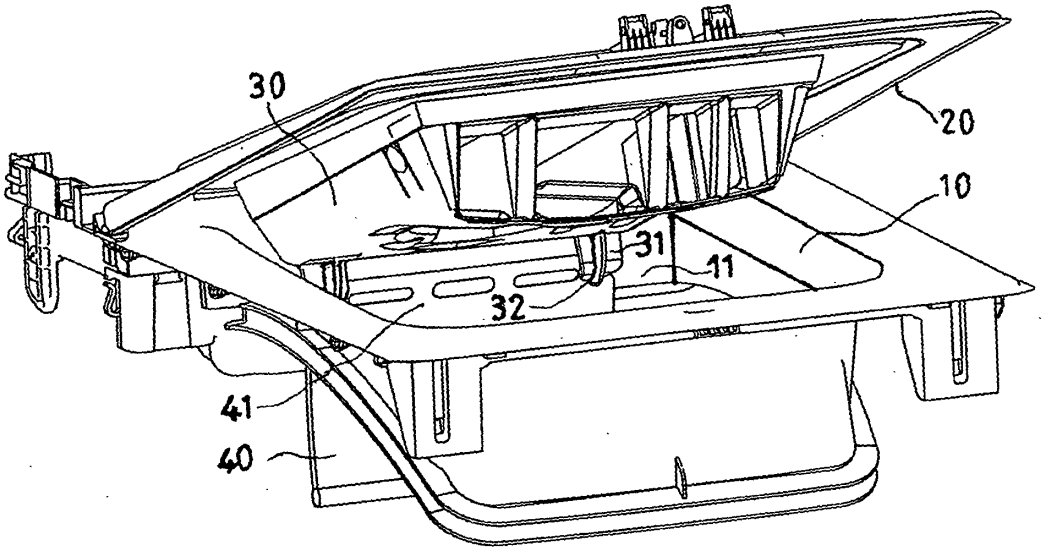


FIG.2

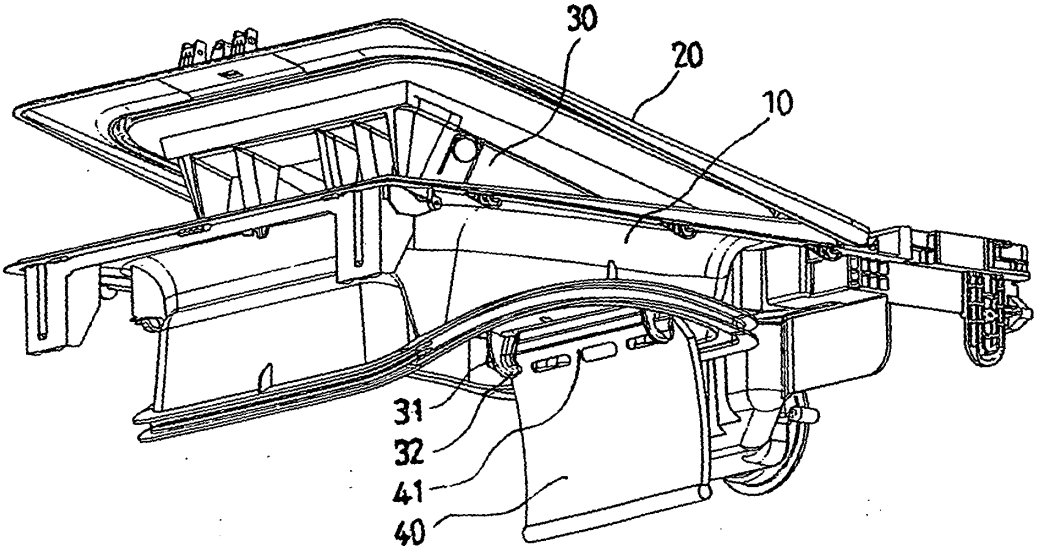


FIG.3

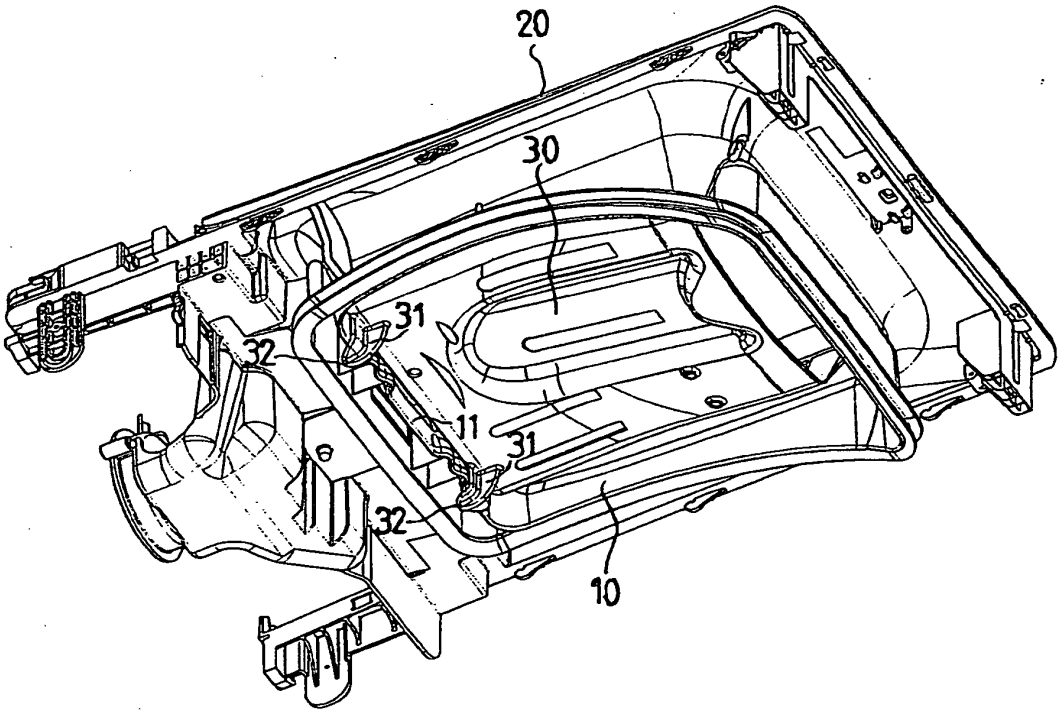
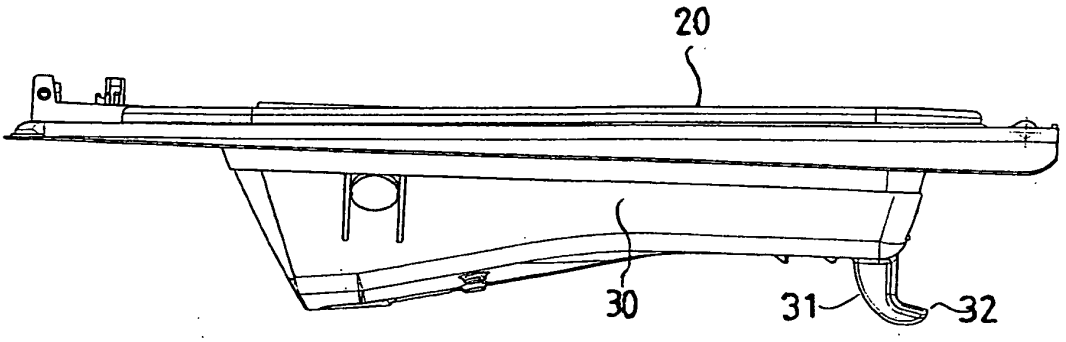


FIG4



REFERENCES CITED IN THE DESCRIPTION

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- FR 2318261 **[0004]**
- EP 0219422 A **[0004]**