

(19)



(11)

EP 2 415 924 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
08.02.2012 Bulletin 2012/06

(51) Int Cl.:
D06F 37/10^(2006.01)

(21) Application number: **10172165.2**

(22) Date of filing: **06.08.2010**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
 GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
 PL PT RO SE SI SK SM TR**
 Designated Extension States:
BA ME RS

(71) Applicant: **Electrolux Home Products Corporation
 N.V.
 1130 Brussels (BE)**

(72) Inventor: **Zownir, Stéphane
 08500 Revin (FR)**

(74) Representative: **Maccalli, Marco et al
 Maccalli & Pezzoli S.r.l.,
 Via Settembrini, 40
 20124 Milano (IT)**

(54) **Door for the drum of a laundry machine**

(57) A top-loading laundry machine comprises a cabinet (105) housing a rotatable drum (120) having an access opening (205) with associated therewith a door (210), the door (210) comprising a first and a second door wings (210a,210b) hinged to the drum (120) in correspondence of said access opening (205) and being movable between an open position and a closed position, a door retaining/opening device (325) being associated with one among the first and second door wings (210a,

210b) for selectively retaining and allowing the opening of the door (210). The door retaining/opening device comprises a pushbutton (330) associated with and movable with respect to said one among the first and second door wings (210a,210b), the pushbutton (330) comprising a seat configured to be engageable by an engaging element (225) provided on the other door wing (210a) in the closed position, for preventing the door (210) from opening.

FIG. 3C

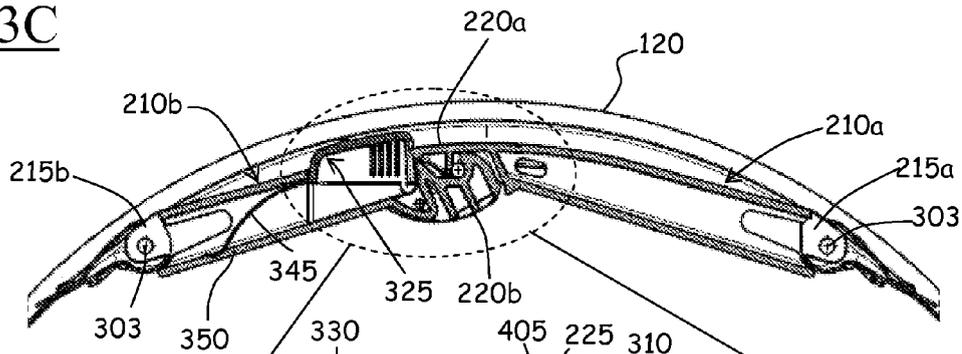
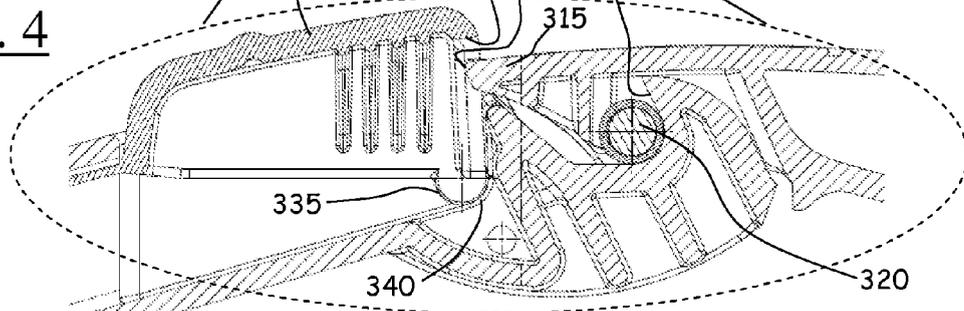


FIG. 4



EP 2 415 924 A1

Description

Background of the invention

Field of the invention

[0001] The present invention generally relates to the field of household appliances, and in particular to laundry machines. More specifically, the present invention relates to a door for the drum of a laundry machine, particularly for a top-loading laundry machine. The top-loading laundry machine may be for example a washing machine, a top-loading laundry dryer or a top-loading washer/drier.

Overview of the related art

[0002] Doors for the drums of top-loading laundry washing machines are often made of stainless steel.

[0003] For example, in EP 1992728 a top-loading laundry washing machine is disclosed, with a tub having a top opening, a drum fitted in a manner such that it can rotate about a substantially horizontal axis inside the tub, at least one door secured to said drum for allowing access to the inside of the drum. In the overview of the prior art provided in that document it is stated that known doors comprise a pair of doors, each secured to the drum on one side of said access opening, in particular through spring-loaded hinges. The free portions of the doors, in particular the portions located on the side opposite to the spring-loaded hinges, are fitted with a closing system which comprises a plurality of hooks arranged on a first door and a plurality of slots arranged on a second door, the open ends of the hooks facing the outer portion of the drum. The springs of the hinges tend to open said first and second doors outwards; consequently, when the elements of the closing system are engaged, the hooks of the first door are pushed into the slots of the second door. In order to open the doors, it is necessary to exert direct pressure onto said first and second doors towards the inside of the drum.

Summary of the invention

[0004] The Applicant tackled the problem of providing a door for the drum of a laundry machine, particularly for a top-loading laundry machine (e.g. a washing machine, a drier or a washer/drier), which is simple to manufacture and thereby can be produced with a reduced cost, which is lightweight but nevertheless robust enough to sustain the relatively high stresses to which the door is subjected during the machine operation, and which has a safe and easy-to-use closure mechanism.

[0005] According to the present invention, there is provided a top-loading laundry washer comprising a cabinet housing a rotatable drum having an access opening with associated therewith a door, the door comprising a first and a second door wings hinged to the drum in correspondence of said access opening and being movable

between an open position and a closed position, a door retaining/opening device being associated with one among the first and second door wings for selectively retaining and allowing the opening of the door. The door retaining/opening device comprises a pushbutton associated with and movable with respect to said one among the first and second door wings, the pushbutton comprising a seat configured to be engageable by an engaging element provided on the other door wing in the closed position, for preventing the door from opening.

[0006] In an embodiment of the present invention, said seat of the pushbutton has an edge that, when the door is closed, surmounts the engaging element.

[0007] In an embodiment of the present invention, the pushbutton is internally hollow and the pushbutton seat for the engaging element is the internally hollow space of the pushbutton.

[0008] In particular, said engaging element may comprise a projection of said other door wing.

[0009] The pushbutton is in particular movable, with respect to said one among the first and second door wings, between a first, door blocking position, and a second, door unblocking position, the pushbutton comprising elastic biasing means for biasing the pushbutton towards the first position.

[0010] The elastic biasing means are preferably in a single piece with the pushbutton.

[0011] The elastic biasing means may in particular comprise at least one flexible tongue.

[0012] The pushbutton may in particular be pivotable with respect to said one among the first and second door wings.

[0013] In particular, the pushbutton may be pivotably received in a seat for pushbutton formed in said one among the first and second door wings.

[0014] In order to be pivotable, the pushbutton may be provided with pivoting means comprising pins adapted to being received in corresponding recesses formed in the seat for pushbutton, so as to allow a pivoting movement of the pushbutton with respect to the seat for pushbutton.

Brief description of the drawings

[0015] These and other features and advantages of the present invention will be made apparent by the following detailed description of exemplary and non-limitative embodiments thereof, description that for better intelligibility should be read in conjunction with the attached drawings, wherein:

Figure 1 schematically shows, in cross-sectional view taken along a vertical plane, and with parts not represented for clarity, a top-loading laundry washing machine with a drum door according to an embodiment of the present invention;

Figures 2A and **2B** show only the drum of the wash-

ing machine of **Figure 1**, with the drum door closed and open, respectively;

Figures 3A, 3B and 3C are sectional views along a plane orthogonal to the drum axis with the drum door in open (**Figure 3A**), intermediate (**Figure 3B**) and closed (**Figure 3C**) positions;

Figure 4 is a detail in enlarged scale of **Figure 3C**;

Figure 5 is a top view of the drum door;

Figures 6A, 6B and 6C are sectional views along the lines **VI_A-VI_A**, **VI_B-VI_B** and **VI_C-VI_C** in **Figure 5**;

Figures 7A, 7B, 7C, 7D, 7E are sectional views along the lines **VII_A-VII_A**, **VII_B-VII_B**, **VII_C-VII_C**, **VII_D-VII_D** and **VII_E-VII_E** in **Figure 5**;

Figures 8 and 9 are exploded views of the drum door from above and below, respectively; and

Figure 10 shows the assembled drum door in perspective from below (on the left) and from above (on the right).

Detailed description of embodiments of the invention

[0016] Making reference to the drawings, in **Figure 1** there is schematically shown a top-loading laundry machine according to an embodiment of the present invention.

[0017] It is underlined that the expression laundry machine may indicate as well a top-loading washing machine, a top-loading drier and a top-loading washer/drier.

[0018] For example in the embodiment illustrated in the enclosed figures the laundry machine is a top-loading washing machine, globally denoted as **100**, comprises a cabinet **105** with a top opening **110** closable by a cabinet door **115** hinged to the cabinet **105**.

[0019] The cabinet **105** accommodates a washing tub, having a top opening (corresponding to the opening **110** of the cabinet **105**) which is closable preferably by the door **115**.

[0020] Clearly if the laundry machine is a drier the washing tub may be not provided.

[0021] A laundry drum **120** is rotatably accommodated within the washing tub (or within the cabinet if the tub, as in a drier, is not provided), with a preferably horizontal rotation axis. The drum **120**, better visible in **Figures 2A and 2B**, preferably made of stainless steel, is generically cylindrical in shape, is closed at the two opposite bases, and has a perforated peripheral wall provided with an opening **205**, for the loading/unloading of the laundry.

[0022] A drum door **210** is provided in association with the drum opening **205**. The drum door **210** comprises a

first and a second door wings **210a** and **210b**, at least one of which (preferably both of them) is made of plastic material, preferably in reinforced polyolefin, more preferably completely and exclusively made of plastic material (i.e. without metallic parts), and is for example made by injection molding.

[0023] Each one of the two wings **210a** and **210b** of the drum door **210** is hinged at one end **215a, 215b** thereof to one of two circumferentially opposite sides of the drum opening **205**. The two door wings **210a** and **210b** can be pivoted from a position in which the drum door **210** is open and leaves the drum opening **205** accessible, called open position (**Figures 1, 2A and 3A**), to a position in which the drum door **210** is closed and closes the drum opening **205**, called closed position (**Figures 2B and 3C**).

[0024] For the hinging to the drum **120**, at least one between the first and second door wings **210a** and **210b** (preferably both of them) comprises a plurality of hinging elements.

[0025] Preferably the hinging elements provided on at least one, preferably both of the two door wings **210a** and **210b** for the hinging to the drum **120** are totally and exclusively made of plastic material, without any reinforcing part in metal; preferably, the hinging elements totally and exclusively made of plastic material are in a single piece (i.e. integrally formed) with the remaining of the respective door wing, and are for example obtained by properly shaping the mold for the injection molding of the door wings.

[0026] Preferably the hinging elements comprises a plurality of eyelets **505**, integrally formed along the ends **215a** and **215b** of the respective door wing, which mesh with corresponding hinging elements, for example corresponding eyelets formed along the sides of the drum opening **205** and through which, preferably, hinge pins **303** pass. For example, in the embodiment illustrated in the enclosed drawings, the eyelets **505** of a door wing comprise standard-width eyelets **505a**, having a first width (along a direction transversal to the door wings) and enhanced-width eyelets **505b** having a second width which is higher (preferably double) than the first width of the standard-width eyelets; each double-width eyelet **505b** is preferably arranged between two standard-width eyelets **505a**, in a position which will be explained afterwards.

[0027] Preferably, the hinging elements provided on the first and/or second door wings **210a** and **210b** (for example the plurality of eyelets **505** of the embodiment illustrated in the enclosed figures) are completely made of plastic material (i.e. they don't comprise metal parts). Advantageously, the eyelets **505a** and **505b** are so shaped as to form reinforcing ribs **507** on their external surface, for example two reinforcing ribs for the standard-width eyelets **505a** and three reinforcing ribs for the double-width eyelets **505b**; the reinforcing ribs contribute to strengthening the eyelets, and thus the hinging elements.

[0028] Advantageously, elastic means, for example torsion springs, not illustrated are provided at the hinges

of the door wings **210a** and **210b** for biasing the door wings **210a** and **210b** towards the open position. In order to bring the door wings **210a** and **210b** to the closed position, the user has to push the door wings down against the action of the springs.

[0029] Advantageously, the second door wing **210b** comprises at least one retaining element; for example, in the embodiment illustrated in the enclosed drawings the free end portion **220b** of the second door wing **210b** is advantageously shaped so as to define at least one retaining element, for example a hook or a succession of hooks **310** like in the shown embodiment (alternatively, a single hook extending for part or all of the width of the free end portion **220b** of the second door wing **210b** may be provided); advantageously, the hooks **310** are totally made of plastic material, without any part of metal. Preferably the at least one retaining element formed in the second door wing **210b** (e.g. the hooks **310** of the embodiment illustrated in the enclosed drawings) is formed as a single piece with the second door wing **210b**; for example the second door wing **210b** may be totally and exclusively made of plastic material (i.e. it does not comprise metallic parts), and the retaining elements formed in the second door wing **210b** may be formed in a single piece (e.g. they are obtained during the molding of the second door wing) with the second door wing **210b**. For example, in the embodiment illustrated in the enclosed figures, the hooks **310** are formed in a single piece construction with the second door wing **210b**.

[0030] Preferably, but not necessarily, the hooks **310** are box-shaped and hollow.

[0031] Advantageously the first door wing **210a** comprises at least one retaining element adapted to engage and cooperate with the retaining element of the second door wing **210b**; for example, in the embodiment illustrated in the enclosed drawings the free end portion **220a** of the first door wing **210a** is shaped so as to define a retaining element, for example comprising a counter-hook **315**, adapted to engage and cooperate with the retaining element of the second door wing **210b** for keeping the drum door **210** closed (e.g. the counter-hook **315** may form a seat adapted to be engaged by the hook or hooks **310** of the embodiment illustrated in the enclosed figures); advantageously, the counter-hook **315** may extend for essentially all the width of the free end portion **220a** of the first door wing **210a**, as in the shown embodiment, or for just part of it, or two or more counter-hooks may be provided in succession in positions corresponding to the hooks **310**. The retaining element formed in the first door wing **210a**, e.g. the counter-hook **315** (i.e. the seat for the hooks **310**) is preferably totally made of plastic material (i.e. it doesn't comprise metallic parts). Preferably, but not necessarily, the at least one retaining element formed in the first door wing **210a**, or part of it (e.g. the counter hooks **315** of the embodiment illustrated in the enclosed drawings), is formed as a single piece with the first door wing **210a**.

[0032] Preferably, the retaining element formed in the

first door wing **210a**, e.g. the counter-hook **315** (i.e. the seat for the hooks **310**) is only present on the bottom side of the door wing **210a** (i.e. the side that faces the interior of the drum when the door wings are in the closed position) and advantageously does not extend to the upper surface of the door wing **210a**; in other words the retaining element formed in the first door wing **210a** is arranged in such a way that when the door **210** is in the closed position, with the retaining element of the first door wing **210a** engaging the retaining element of the second door wing **210b**, the retaining element of the second door wing **210b** (e.g. the hooks **310**) is not accessible (or does not protrude) from the outer side of the drum door **210** (i.e. the side that faces the exterior of the drum when the door wings are in the closed position); this fact avoids, for example, that when the door **210** is closed, a user can be harmed by the hooks **310** when touching the door wing **210a**.

[0033] Preferably, as in the shown embodiment, the retaining element formed in the first door wing **210a** comprises a reinforcement bar **320**, made of a suitably stiff and robust material, for example in metal, preferably steel, which is provided in correspondence of the counter-hook **315**, for instance extending for essentially the all width of the free end portion **220a**, passing through eyelets **903** (see Fig. **9**) which are preferably totally made of plastic without any metal part and are preferably so shaped as to define reinforcing ribs on their external surface (alternatively, the bar **320** may be embedded in the first door wing **210a** by placing the bar **320** in the injection mould).

[0034] In a further embodiment the reinforcement bar may be made of plastic material, and it can be obtained in a single-piece construction with the counter-hooks **315**, for example during the molding of the door wing **210a**.

[0035] When the two door wings **210a** and **210b** are pushed down and brought to the closed position, the retaining element formed in the first door wing **210a** (e.g. the counter-hook **315**) engages the retaining element formed in the second door wing **210b** (e.g. the hooks **310**), and the latter retains the retaining element formed in the first door wing **210a** (e.g. the counter-hook **315**); for example, with reference to the embodiment illustrated in the enclosed figures, the hooks **310** engage the seat defined by the counter-hook **315**, and, when in this condition, the action of the hooks **310** is exerted on the bar **320**, which is retained by the hooks **310** and thus prevents the drum door **210** from opening against the bias of the springs.

[0036] A door retaining/opening device **325** is provided for selectively retaining and allowing the opening of the drum door **210**. The door retaining/opening device **325** is mounted preferably to the second door wing **210b**. The retaining/opening device **325** comprises a pushbutton **330** that is preferably housed in a seat formed advantageously in the top of the second door wing **210b**. The pushbutton **330** is preferably hollow and frontally open,

and it is adapted to be pivoted to the respective door wing **210b** (and in the example disclosed in the enclosed figures pivoted to the pushbutton seat) by suitable pivoting means comprising, for example, two rounded projections **335**, formed preferably at the bottom of the two lateral walls of the pushbutton, that form pins being received in corresponding rounded recesses **340** formed in the pushbutton seat, so as to allow a pivoting movement of the pushbutton **330** with respect to the pushbutton seat.

[0037] The pushbutton **330** advantageously comprises a biasing element adapted for biasing the pushbutton **330** to project outwards from the pushbutton seat in a blocking position, illustrated for example in **Figures 3C** and **4**, in which, when the drum door **210** is closed, an upper edge **405** of the front aperture of the pushbutton **330** surmounts an engaging element of the first door wing **210a**, for example a projection **225** of the counter-hook **315** which, in the closed position, protrudes into the pushbutton **330** through the front aperture thereof, so as to prevent, as will be better explained in the following, the unintentional opening of the drum door **210**. In the embodiment illustrated in the enclosed drawings, the biasing element advantageously comprises resilient tongues **345**, e.g. formed in a single piece with the pushbutton **330**, extending rearwardly therefrom, and which, by abutting against a wall **350** of the second door wing **210b**, bias the pushbutton **330** to project towards the external of the pushbutton seat in the above mentioned blocking position.

[0038] With reference to the attached drawings, in order to open the drum door **210**, the user has to push the pushbutton **330** down against the action of the biasing resilient tongues **345**. By doing this, the pushbutton **330** rotates backwards and the upper edge **405** of the pushbutton **330** moves slightly rearward, up to an unblocking position of the pushbutton **330** (illustrated for example in **Figure 3B**) in which it no longer surmounts the counter-hook projection **225**. When the pushbutton **330** has been completely pushed down into the respective seat, the further pushing by the user causes the second door wing **210b** to rotate downwards around its hinge, and in this way the hook **310** escapes from the counter-hook **315** (**Figure 3B**); under the bias of the torsion spring biasing the first door wing **210a** towards the open position, the first door wing **210a** rotates to the fully open position, and the same occurs to the second door wing **210b**, under the action of the associated torsion spring. When the door wings are in the closed position and the pushbutton **330** is not pressed down, the upper edge **405** surmounting the projection **225** of the counter-hook **315** prevents the first door wing **210a** from rotating downwards of such an extent which is sufficient for the hooks **310** to escape from the counter-hook **315**, and in this way the unintentional opening of the drum door **210** is prevented.

[0039] Advantageously at least one of the two door wings **210a** and **210b**, preferably both of them, has preferably an essentially hollow structure, so as to be lightweight. Preferably, at least the second door wing **210b**,

having the retaining element formed therewith, has an essentially hollow structure.

[0040] Preferably, but not necessarily, for the purpose of having door wings **210a** and **210b** that are lightweight and at the same time robust, especially in respect of the stresses that the drum door **210** experiences during a spinning phase of the washing cycle, at least one of, but preferably both, the first and second door wings **210a** and **210b** is shaped so that, on the inner side thereof (the side which, when the door wings are mounted to the drum and in the closed position, faces the drum interior), an internally hollow, box-shaped central rib **705** is defined, having side walls **710a** and an upper wall **710b**, extending longitudinally to the door wing, and which per-se also forms longitudinal reinforcing ribs. Longitudinal reinforcement ribs **715** are also preferably formed in the hollow space internal to the box-shaped central rib **705**. More preferably, in addition to the box-shaped central rib **705**, at least one of the door wings **210a** and **210b**, preferably both of them is also shaped so as to define a pair of further longitudinal hollow ribs **720**, for example located at the two opposite sides of the respective door wing. The hollow ribs **705** and **720** are useful to keep the door wing structure lightweight and at the same time, extending longitudinally, strengthen the door wings structure against stresses that, in use (for example, during the drum spinning phase), act longitudinally to the drum door wings and tend to cause the drum door **210** to open.

[0041] In a further embodiment, not illustrated, one or both the door wings comprises a different number of box shaped ribs extending longitudinally to the door wing, and which per-se also forms longitudinal reinforcing ribs.

[0042] The lateral walls delimiting laterally the box-shaped ribs (in the embodiment illustrated in the enclosed drawings the lateral walls **710a** delimiting laterally the central box-shaped ribs **705**) are preferably located in correspondence of the standard-width eyelets **505a** of the pluralities of eyelets **505** which form the hinging elements of the door wings **210a** and **210b**, whereas the enhanced-width eyelets **505b** are preferably located where the lateral walls **710a** are not present; the reason for this choice is that the hinge is an area of major stress for the door wings, so that the eyelets (to which the stress of the hinge is transmitted) need to be sufficiently robust. Where the lateral walls **710a** are present, they act as reinforcement ribs so that there the door wing structure, and particularly the hinge area, is strengthened, and standard-width eyelets **505a** are sufficient, whereas where the lateral walls **710a** are not present, the door wing structure is less robust and the enhanced-width eyelets **505b** are preferable, in order to strengthen the hinge.

[0043] Advantageously in at least one of, but preferably both, the two door wings **210a** and **210b**, a pair of depressions forming chambers **905** are defined between the box-shaped central rib **705** and either one of the further longitudinal hollow ribs **720**; preferably the generic one of the chambers **905** is delimited between the faced side walls of two contiguous box-shaped ribs (in the ex-

ample of the enclosed figures by one of the side walls **710** of the box-shaped central rib **705** and an inner wall **725** of the respective further longitudinal hollow rib **720**. In use, the chambers **905** advantageously collect water/washing liquid from the bottom of the washing tub (when, during the drum rotation, the drum angular position is such that the drum door **210** is located at the bottom of the washing tub) and lift the water/washing liquid up, for its successive fall down when the drum door **210** moves toward the top of the machine; this helps improving the effectiveness of the laundry washing action.

[0044] Preferably, in a position corresponding to the enhanced-width eyelets **505b**, reinforcement ribs **915** are formed which preferably, starting from the ends **215a**, **215b**, degrades within the chambers **905**.

[0045] Advantageously, the second door wing **210b** has a protrusion **805**, preferably arc-shaped, on the inner side thereof in correspondence of the hooks **310**, and the protrusion **805**, in operation, acts as one of the lifters usually provided inside the drum **120** in circumferential succession along the peripheral wall for lifting the laundry being washed. Preferably, the arc-shaped protrusion **805** has a surface defined by several transversal and longitudinal reinforcing ribs **907** crossing each other; for contributing to keep the door wing structure lightweight and at the same time strong; preferably, the ribs **907** are formed essentially only proximate to the free end of the second door wing **210b** (preferably exception made for the central region of the door wing **210b**), so that when the drum rotates in the direction of arrow **A** in **Figure 9**, the flow of air (opposite to the drum rotation sense) encounters less resistance.

[0046] The structure of one or both the door wings **210a** and **210b** is further strengthened by the provision in one or both of them of one or more transversal hollow chambers **605**, preferably, but not necessarily, in correspondence or proximate to the free ends **220a** and **220b**, *i.e.* where the retaining elements (*e.g.* the hooks **310** and counter-hooks **315**) are formed. The walls defining the chambers **605** act as transversal reinforcing ribs that help increasing the strength of the door wings structure; this is particularly advantageous in correspondence of the area where the first and second door wings **210a** and **210b** engage one with the other when the drum door **210** is closed, since this area is subject to significant stresses when in use the drum is rotated.

[0047] Preferably, although not necessarily, internal ribs may be formed inside the chambers **605**, for further strengthening such area of the door wings. The transversal hollow chambers **605** may or not communicate with the interior of the box-shaped central ribs **705**.

[0048] The door retaining/opening device according to the present invention facilitates the operation of opening of the drum door by the user, and at the same time ensures that unintentional opening of the drum door does not take place.

[0049] Advantageously, one or both the door wings **210a** and **210b** are formed as single pieces of plastic,

for example obtained by injection molding into respective moulds.

[0050] The fact that the door wings **210a** and **210b** are entirely in plastic material makes them more suitable to being handled and touched by the user compared to metal door wings; another advantage is that the door wings can be formed in various shapes and colors. Also, plastic material is less subject to corrosion than metal.

[0051] The present invention has been here described making reference to an exemplary embodiment thereof. Those skilled in the art will of course be able to devise several modifications to the described embodiment, as well as other embodiments of the invention, without departing from the scope of the appended claims.

[0052] For example, the retaining means provided on the first and second door wings might, in alternative invention embodiments, not be present, and the closure of the drum door be ensured by the door retaining/opening device only.

Claims

1. A top-loading laundry machine comprising a cabinet (**105**) housing a rotatable drum (**120**) having an access opening (**205**) with associated therewith a door (**210**), the door comprising a first and a second door wings (**210a,210b**) hinged to the drum in correspondence of said access opening and being movable between an open position and a closed position, a door retaining/opening device (**325**) being associated with one (**210b**) among the first and second door wings for selectively retaining and allowing the opening of the door, **characterized in that** the door opening device comprises a pushbutton associated with and movable with respect to said one among the first and second door wings, the pushbutton comprising a seat configured to be engageable by an engaging element (**225**) provided on the other door wing (**210a**) in the closed position, for preventing the door from opening.
2. The laundry machine according to claim 1, wherein said seat of the pushbutton has an edge (**405**) that, when the door is closed, surmounts the engaging element (**225**).
3. The laundry machine according to claim 1 or 2, wherein the pushbutton is internally hollow and the pushbutton seat for the engaging element is the internally hollow space of the pushbutton.
4. The laundry machine according to claim 1, 2 or 3, wherein said engaging element comprises a projection (**225**) of said other door wing.
5. The laundry machine according to any one of the preceding claims, wherein the pushbutton is mova-

ble, with respect to said one among the first and second door wings, between a first, door blocking position, and a second, door unblocking position, the pushbutton comprising elastic biasing means **(345)** for biasing the pushbutton towards the first position. 5

6. The laundry machine according to claim 5, wherein the elastic biasing means are in a single piece with the pushbutton. 10
7. The laundry machine according to claim 6, wherein the elastic biasing means comprise at least one flexible tongue.
8. The laundry machine according to claim 5, 6 or 7, wherein the pushbutton is pivotable with respect to said one among the first and second door wings. 15
9. The laundry machine according to claim 8, wherein the pushbutton is pivotably received in a seat for pushbutton formed in said one among the first and second door wings. 20
10. The laundry machine according to claim 9, wherein, in order to be pivotable, the pushbutton is provided with pivoting means comprising pins adapted to being received in corresponding recesses formed in the seat for pushbutton, so as to allow a pivoting movement of the pushbutton with respect to the seat for pushbutton. 25 30

35

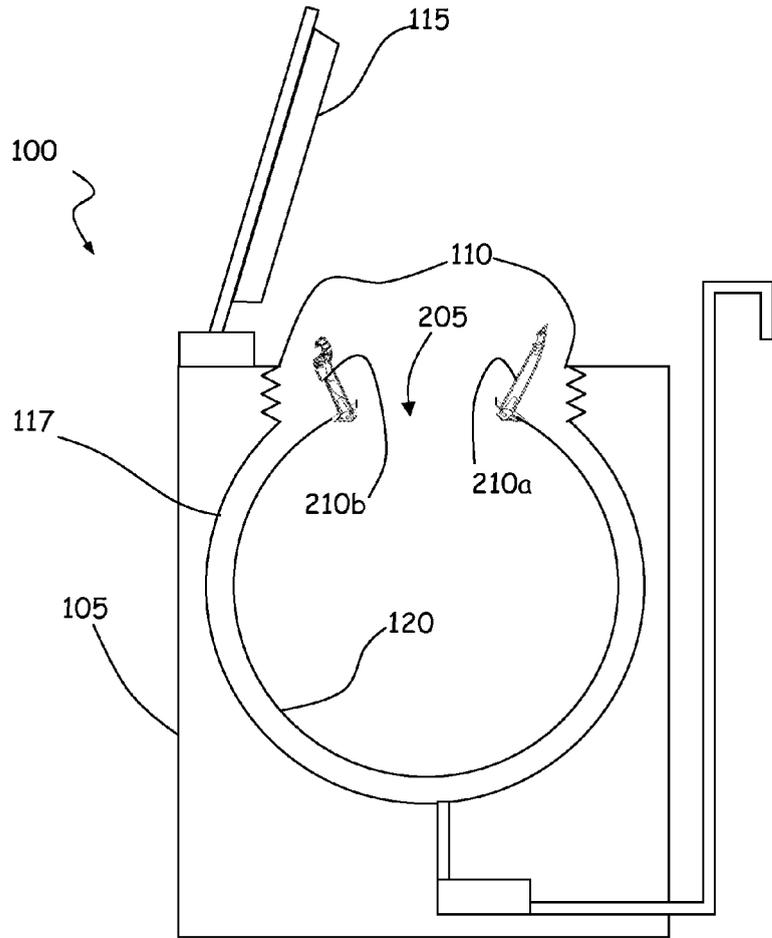
40

45

50

55

FIG. 1



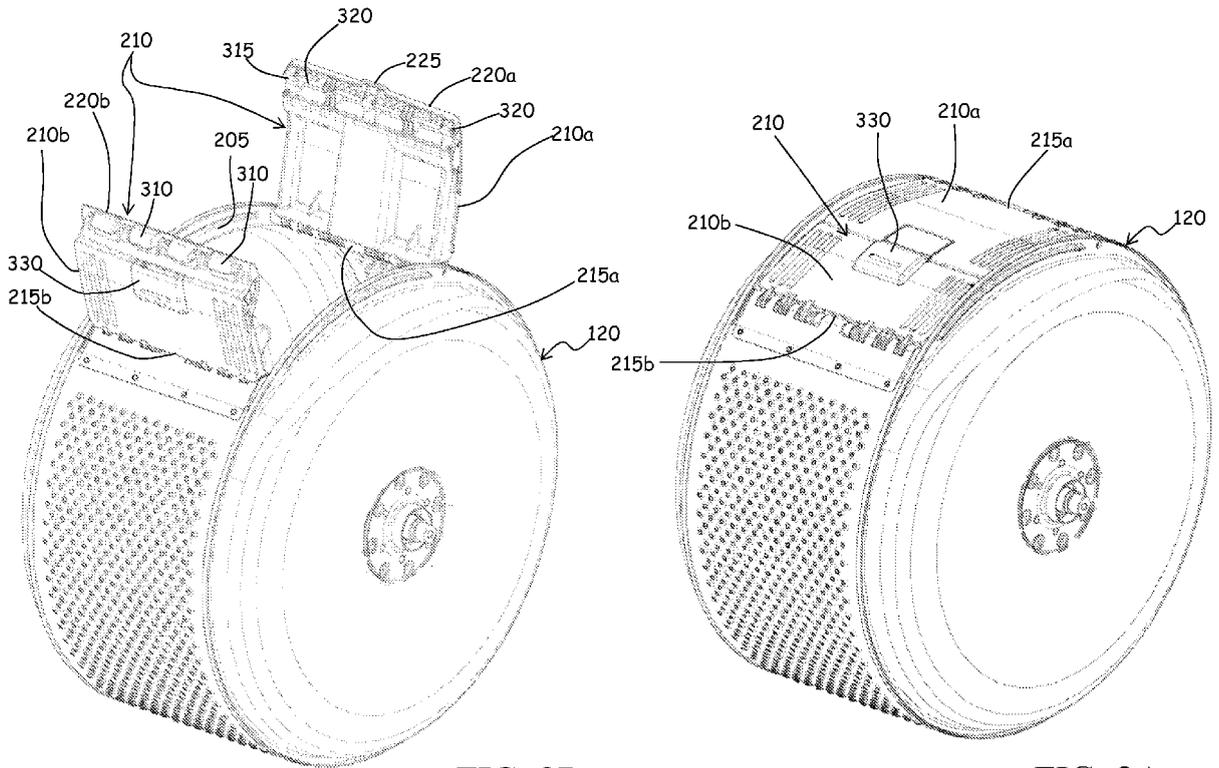


FIG. 2B

FIG. 2A

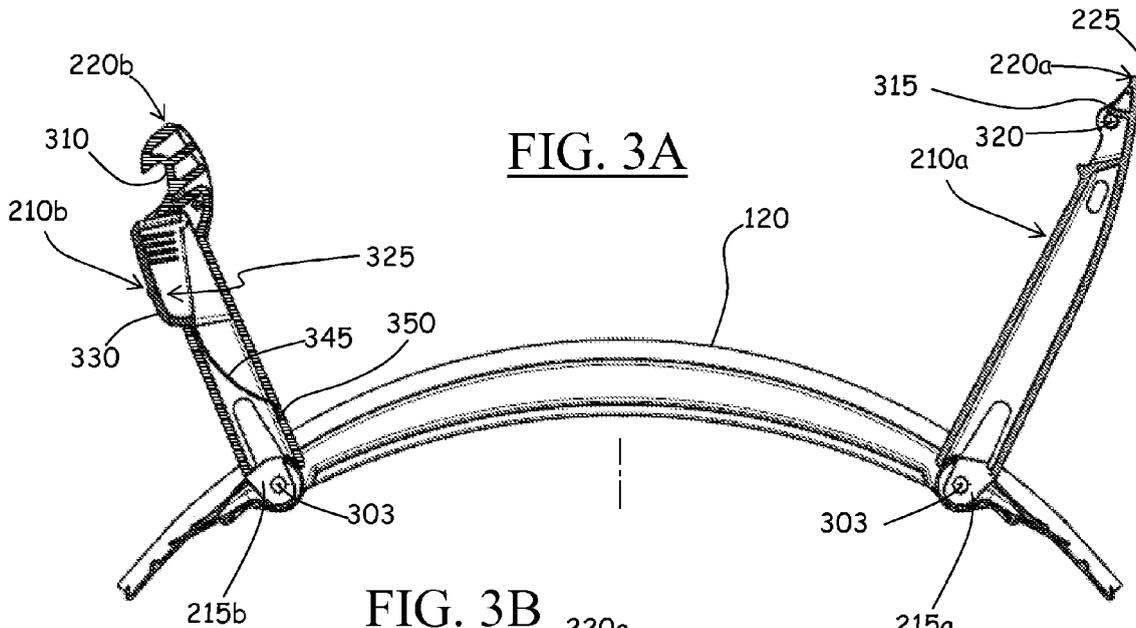


FIG. 3A

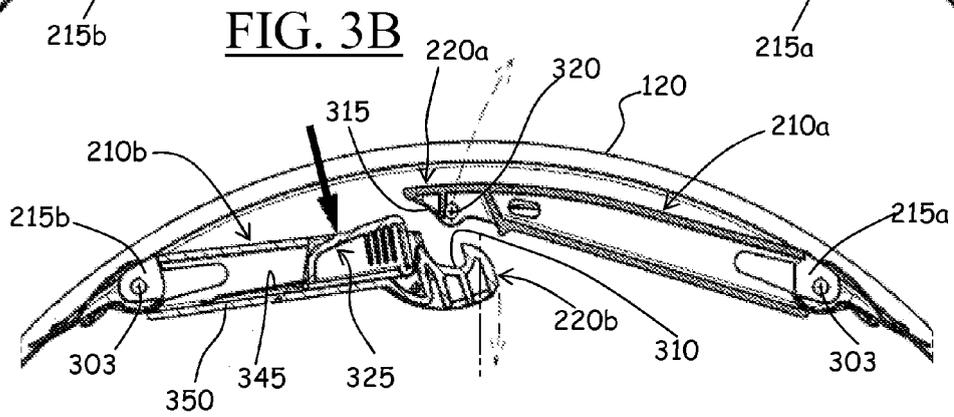


FIG. 3B

FIG. 3C

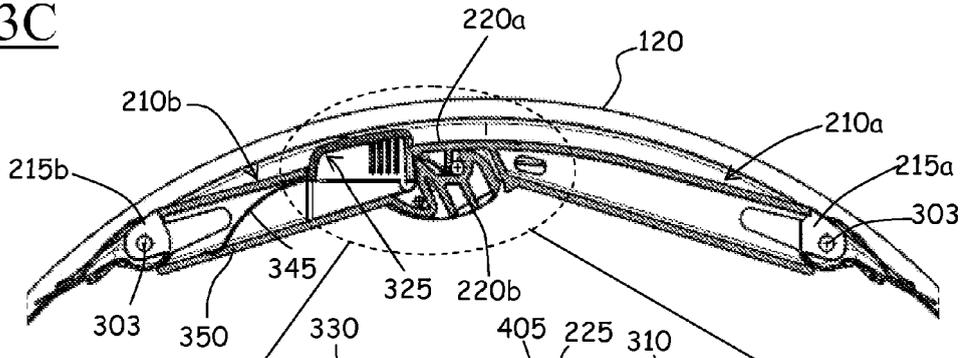
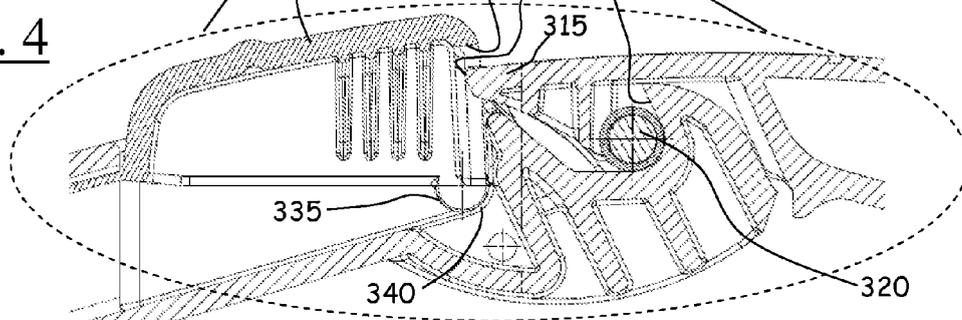


FIG. 4



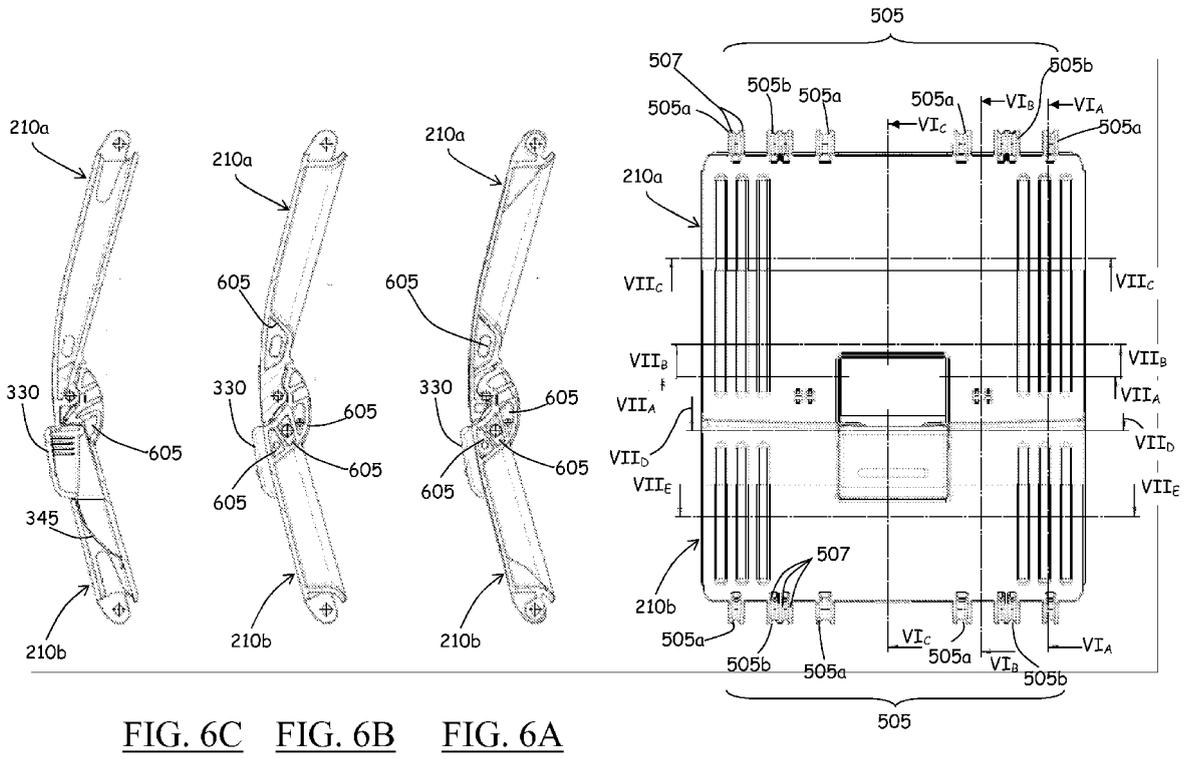


FIG. 7A

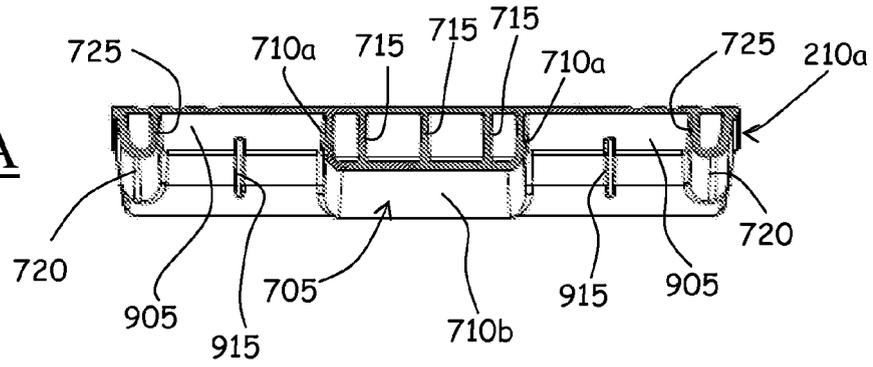


FIG. 7B

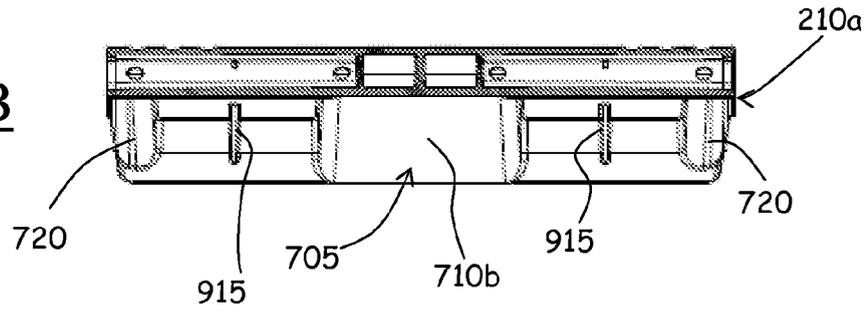


FIG. 7C

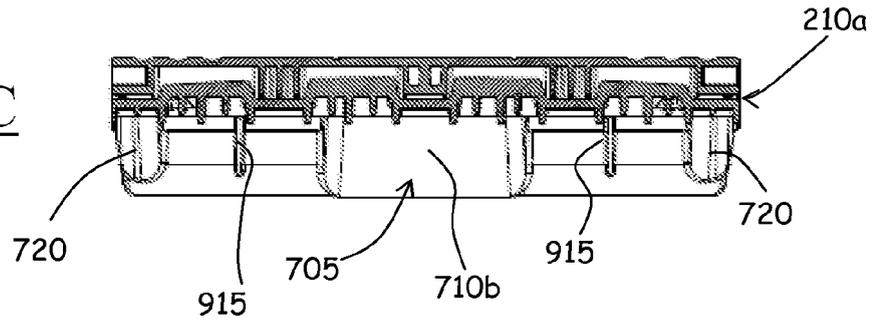


FIG. 7D

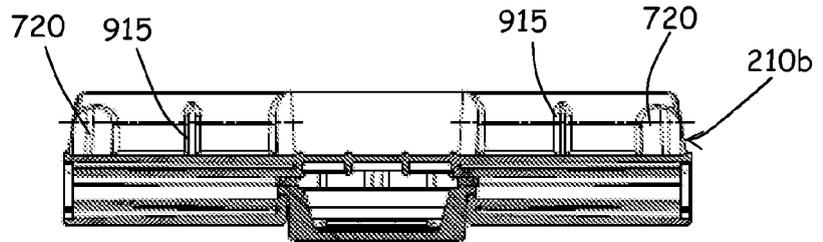
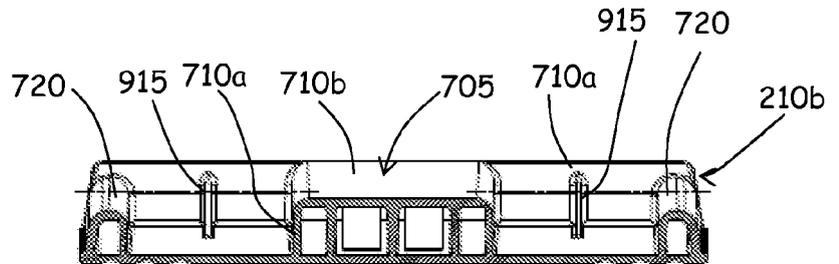


FIG. 7E



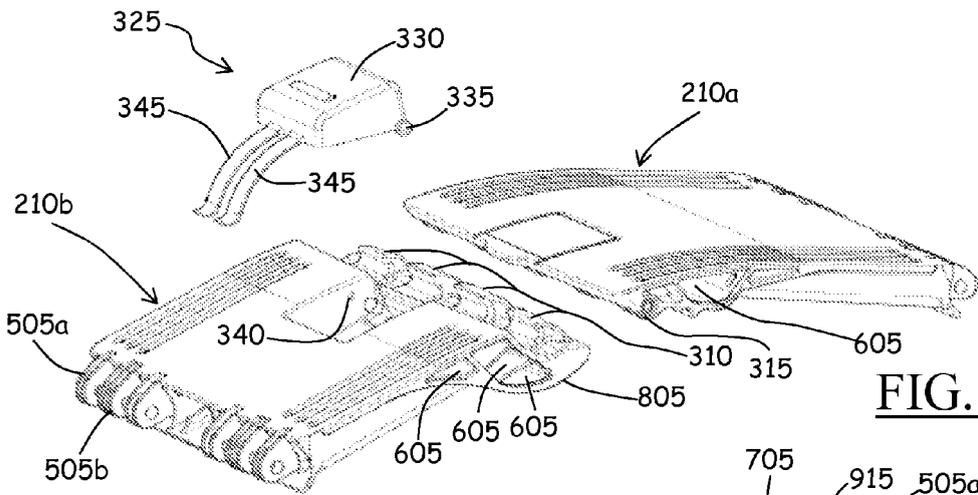


FIG. 8

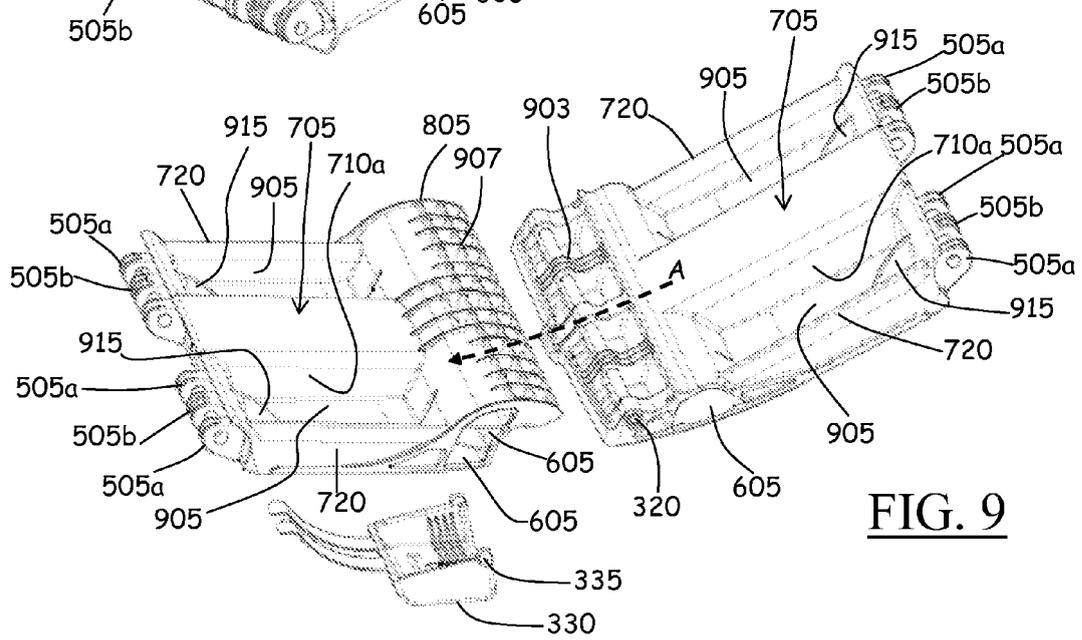


FIG. 9

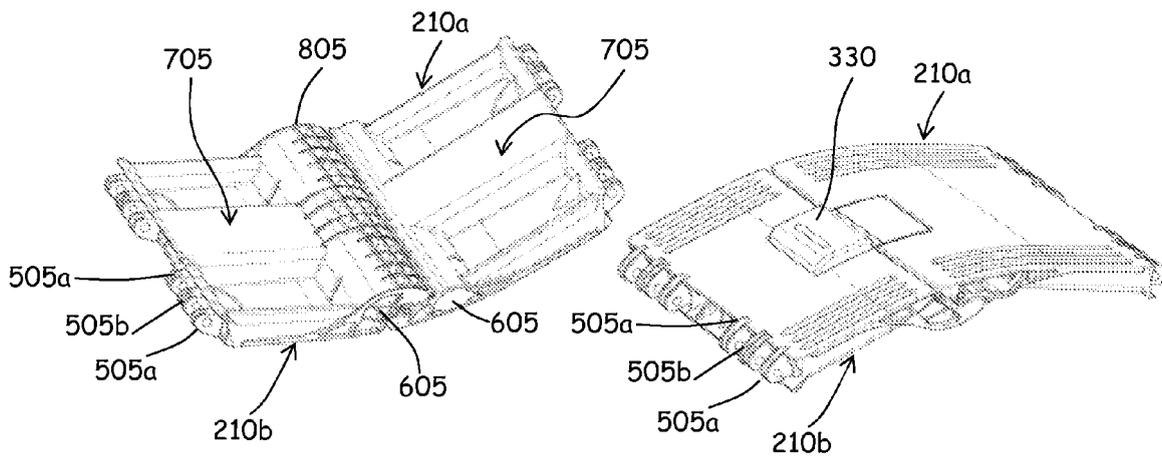


FIG. 10



EUROPEAN SEARCH REPORT

Application Number
EP 10 17 2165

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 2 819 272 A1 (ELECTROLUX HOME PRODUCTS FRANC [FR]) 12 July 2002 (2002-07-12) * page 1, lines 1-3; page 6, line 13 - page 8, last line; figures 1, 2, 4-6 *	1-10	INV. D06F37/10
A	EP 0 402 252 A1 (ARDAM SNC [FR]) 12 December 1990 (1990-12-12) * column 1, lines 1-3; column 3, line 15 - column 4, line 1; claims; figures *	1-10	
A	FR 2 289 659 A1 (AMIENS CONST ELECT MEC [FR]) 28 May 1976 (1976-05-28) * claims; figures *	1-10	
A,D	EP 1 992 728 A2 (INDESIT CO SPA [IT]) 19 November 2008 (2008-11-19) * the whole document *	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 2 February 2011	Examiner Clivio, Eugenio
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

2

EPO FORM 1503 03.02 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 10 17 2165

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-02-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2819272	A1	12-07-2002	DE 10200762 A1	18-07-2002
			IT PN20020001 A1	09-07-2003

EP 0402252	A1	12-12-1990	DE 69014237 D1	05-01-1995
			DE 69014237 T2	14-06-1995
			FR 2648175 A1	14-12-1990

FR 2289659	A1	28-05-1976	DE 2548488 A1	06-05-1976
			GB 1513470 A	07-06-1978
			IT 1043658 B	29-02-1980

EP 1992728	A2	19-11-2008	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1992728 A [0003]