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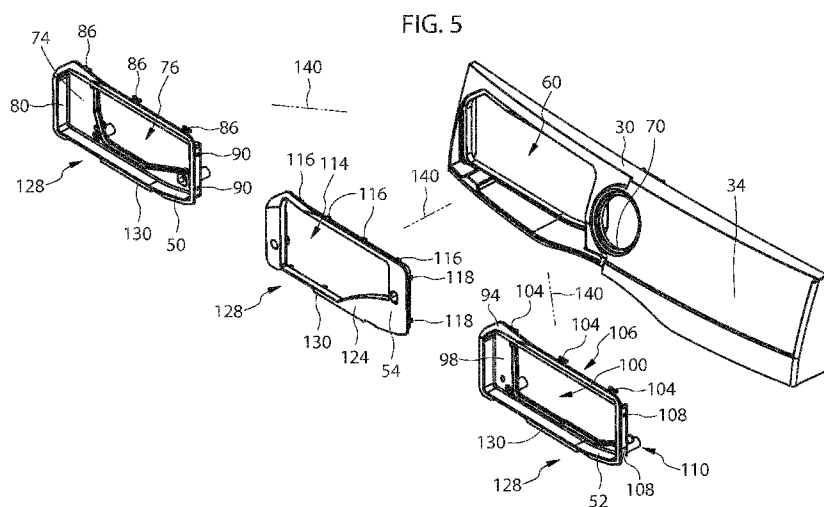
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(54) Title: LAUNDRY TREATMENT APPLIANCE WITH USER INTERFACE



(57) Abstract: Laundry treatment appliance (2), comprising a casing (6) and a user interface (34) which comprises an opening (60) for receiving a drawer (42), wherein a further interfacing element (50, 52, 54) is provided, which is connected to said user interface (34) in association with said opening (60), whereby said interfacing element (50, 52, 54) is configured for insertion and/or extraction of said drawer (42)).

## LAUNDRY TREATMENT APPLIANCE WITH USER INTERFACE

Field of the Invention

The present invention generally relates to a laundry treatment appliance, especially a front loading washing machine, dryer or combined washer and dryer, both for domestic and professional use. More particularly, the present invention relates to a laundry treatment appliance comprising a casing and a user interface comprising an opening for receiving a drawer. It further relates to a method for assembling a laundry treatment appliance.

Background of the invention

Laundry treatment devices such as washing machines, washers, dryers or combined washers and dryers, typically comprise a substantially parallelepiped-shaped enclosing and an inner compartment for housing items to be treated (e.g. laundry to be washed and/or dried), and an access door for accessing the inner compartment, thereby allowing loading/unloading operations of the items by a user.

These appliances also usually comprise a user interface for allowing the user to manually control operation of the appliance and ascertain an operational state thereof. They typically also comprise a drawer moveable within or beside the user interface. In washing machines, the drawer allows to introduce products such as detergents or softeners to be applied to the laundry during a washing cycle. In a tumble dryer, for instance a condenser-type dryer, the drawer comprises a tank for collecting condensate liquid that has been extracted from the laundry by a drying air flow passing through the drum. In both cases, the drawer has to be extracted and inserted periodically. The user interface is usually assembled and/or associated with the housing or casing of the laundry treatment appliance directly or through a front panel.

The European patent EP 2 140 0 58 B1 discloses a front panel for a laundry treating machine, which in a first embodiment comprises a single component and in a second embodiment comprises a two-piece components. In both cases, the laundry treating machine comprises a user interface and a shaped hole for insertion of a drawer.

A front panel in a single-piece design is known from US 8,178,802 B2, which can provide a user interface and an opening for a drawer to be inserted by sliding. It can also be realized without a drawer for a vent-type dryer where a tank is not necessary.

From the European patent EP 1 900868 A1, a condenser-type dryer is known which comprises a front panel with a user interface and a drawer with a tank for the condensate liquid collection.

For each type of laundry treatment appliances such as washing machines, washers, dryers or combined washers and dryers, various components have to be manufactured, for many of them dedicated molds have to be built or special machines have to be designed. One of these components that is needed for these types of laundry machines is the user interface, having an opening for a drawer. Since laundry treatment appliances, depending on model and/or functionality, can have different drawers which can differ in their design, proportions or functionality, for each drawer a user interface must be specially designed and manufactured to match with the corresponding drawer, increasing the manufacturing investment and the logistic costs .

#### Summary of invention

It is an object of the present invention to provide a laundry appliance easier to assembly, with reduced components manufacturing costs.

It is a further object of the present invention to provide a laundry treatment appliance with a casing and user interface that is not limited to adapt only to a specifically designed drawer.

It is a further object of the present invention to provide an improved method for assembling a laundry treatment appliance with a casing and a user interface.

According to a first aspect, the invention relates to a laundry treatment appliance, comprising a casing and a user interface which comprises an opening for receiving a drawer, wherein a further interfacing element is provided, which is connected to the

user interface in association with the opening, whereby the interfacing element is configured for insertion and/or extraction of the drawer.

Preferred embodiments of the invention are described in relation to the dependent claims and the description of the enclosed drawings.

The invention is based on the consideration that different types or models of laundry treatment appliances such as washer, dryer or combined washers and dryers need specific drawers with specific functionality. Drawers for different machines can have different shapes, dimensions, positions and different fixation points. For each specific drawer, the user interface of the appliance provides an opening for inserting and/or extracting this drawer, wherein the opening, in particular its shape and its dimensions, has to be adapted to receive and to allow said drawer insertion / extraction. This implies that for each drawer, a fitting user interface has to be built, which usually implies designing a dedicated mold and/or tool.

Applicant has found that by providing an additional interfacing element that provides the functionality to connect the drawer to the user interface, the same kind of user interface can be used for the manufacturing of different laundry treatment devices which employ different kinds of drawers. Since the interfacing element adapts the specific spatial dimensions and the shape of the drawer to the user interface, it is only a rather small component compared to both user interface and drawer that has to be adapted, thus saving production costs, assuring at the same time a easy assembly of the components.

The terms laundry treatment appliance or laundry machine or laundry treatment device includes washing machines as such but also combined washing/drying machines that can incorporate both functionalities. Also the terms laundry washing machine and washing machine are used interchangeably. The laundry machine can, for instance, be designed as a front-loading laundry washing machine.

Preferably, the casing comprises a front panel with a user interface, which on a front wall comprises an opening, the interfacing element being connected to the front panel in association with the panel opening. Thus the front panel encompasses both the

user interface, which typically provides controls for the user for controlling the laundry appliance, and the opening for receiving the drawer. The front panel can comprise controls for operating the appliance as well as displays or lights for indicating selected choices and/or the current status of the appliances. It preferably comprises a rotatable / pushable knob which can be used for selecting the value of an operational parameter and/or a program and / or to switch on / off the appliance / program. The opening and the user interface are preferably arranged adjacent to each other in a horizontal manner. A rotatable knob is then preferably arranged between user interface and opening.

The interfacing element advantageously comprises an interface opening for insertion and / or the extraction of the drawer. In this manner, in a mounted position of the interfacing element in the user interface, the drawer is associatable with the interfacing element and during movement through the interface opening it is also moving through the opening.

In a preferred embodiment, the interfacing element comprises a front side flush with the user interface front wall on mounting position of said interfacing element. Said front side assures an external surface at the same level and continuous with respect to those of the user interface surface, resulting in a good look of the casing, without step portions, once the interfacing element is mounted on the appliance.

Said interfacing element preferable comprises a frame comprising a recessed front side having the interfacing opening. This configuration allows the drawer frontal portion justified within the frame.

Advantageously, the interfacing element is connected to the user interface and / or said front panel by a clip and/or snap mechanism. By a clip or snap mechanism, the interfacing element can be spatially positioned and/or fixed in the user interface in a removable or a non-removable manner, in a firm way, such that when the drawer is inserted or extracted as needed, the interfacing element stays fixed with the user interface. In case the interfacing element and/or user interface need to be cleaned or replaced, if said interfacing element is fixed in a removable manner it can be disassembly from the user interface. This disassembly can also be done if the interfacing

element is damaged. It can also be done if another drawer with different specifications, spatial dimensions etc. is to be used in the future.

In a preferred embodiment, the user interface and/or the front panel and/or the interfacing element comprise at least one snapping element, this snapping element being configured to engage the interfacing element with the user interface and/or with the front panel.

Preferably, the interfacing element comprises at least one connection portion and the user interface and/or the front panel comprises at least one retainer or vice versa, the connection portion and the retainer being configured to engage with each other in the mounting position of the interfacing element.

Advantageously, the least one retainer has an essentially C-shaped form. Alternatively, it can essentially have a step-like form. The material for the retainers is preferably elastic plastic or another elastic material. The retainers thus can bend or be bent during insertion and/or extraction of the interfacing element in the opening of the user interface or front panel. Alternatively, the retainer can be of rigid material; in this case the connection portion is preferably configured elastically deformable.

Preferably, the at least one connection portion is configured as a snapping element. It can for instance have the shape of a hook.

The interfacing element is in a preferred embodiment built as a cover, at least partially covering the panel opening. This design is useful for laundry treatment appliances where no drawer is necessary such as tumble dryers built as vent-type dryers (i.e. dryers where the moisture – loaded air is discharge on the outside ambient of the machine directly, without a previous moisture separation and collection on a suitable tank). Most preferably, the cover is fully covering the opening, thereby leaving no possibility for dirt or foreign particles to enter the interior of the laundry treatment appliance.

According to a further aspect, the invention relates to a laundry treatment appliance comprising a casing with a user interface and an opening for receiving a drawer,

whereby a further interfacing element is provided, which is connected to the casing in association with the opening, the interfacing element being configured for insertion and/or extraction of the drawer. This configuration relates to laundry devices which have user interface and the position of the drawer on different parts of the machine. As an example, the user interface can be provided on the front side of the appliance, while the drawer is inserted or mounted on a lateral part of this machine. As a further example, both the user interface and the drawer can be provided on the front side of the appliance, but as a separate components each other.

According to a third aspect, the invention relates to a method for assembling a laundry treatment appliance, the appliance comprising a casing and a user interface comprising an opening for connecting an interfacing element, the interfacing element comprising an interface opening for insertion of a drawer, the method comprising the step of inserting an interfacing element into the opening and connecting the interfacing element to the user interface.

A preferred embodiment of this method comprises additional step of inserting a drawer into the interface opening. This step is not needed if no drawer should be inserted, for instance for vent-type dryers for which the interfacing element can be built as a cover.

According to a fourth aspect, the invention relates to a method for assembling a laundry treatment appliance, the appliance comprising a casing and a user interface comprising an opening for connecting an interfacing element, the interfacing element comprising an interface opening for insertion of a drawer, the method comprising the steps of inserting a drawer into an interfacing element and connecting the interfacing element to the user interface while the drawer stays inserted into the interfacing element. Hence first the sub-assembly comprising the drawer and the interfacing element is assembled, and then their combination is installed in the opening of the user interface.

The advantages of the invention are especially as follows. By employing a separate interfacing component or intermediate component between user interface and drawer, the same kind of user interface can be used for different types of drawers, since

the interfacing element allows the drawer to be fitted into an opening in the user interface. In production, a same kind of user interface can be produced for different laundry appliances which need different types of drawers. The complexity of the user interface assembling can thus be reduced. Only the interfacing element has to be produced differently for each type of drawer. Thereby, investments are decreased. Additionally, exchangeable drawers can become decoration parts, varying, for instance, in color, material, finishing, etc.

#### Brief description of the drawings

Further features and advantages of the present invention shall become clearer from the following detailed description of some of its preferred embodiments, made with reference to the attached schematic drawings and given as an indication and not for limiting purposes.

In particular, the attached drawings are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification. The drawings together with the description explain the principles of the invention. In the drawings, corresponding characteristics and/or components are identified by the same reference numbers. In these drawings:

FIG. 1 shows a front-loading washing machine with a front panel comprising a user interface with an opening and an interfacing element;

FIG.2 shows a front-loading washing machine with a front panel with a user interface with an opening and an interfacing element in a preferred embodiment;

FIG. 3 shows a front-loading washing machine with a front panel with a user interface with an opening and an interfacing element in another preferred embodiment;

FIG. 4 shows a front-loading washing machine with a front panel with a user interface with an opening and an interfacing element in yet another preferred embodiment;

FIG. 5 shows in a perspective view the front panel and the interfacing elements shown in FIGs. 2 to 4;

FIG. 6 shows in a frontal view the front panel and the interfacing elements shown in FIGs. 2 to 5;

FIG. 7 shows in a perspective view the front panel and the user interface of FIG. 2 in a state before assembly;

FIG. 8 shows in a perspective view the front panel and the user interface of FIG. 2 in an assembled state;

FIG. 9 shows in a frontal view the front panel and the user interface of FIG. 2 in an assembled state;

FIG. 10 shows a section through front panel and interfacing element along the axis A-A shown on FIG. 9;

FIG. 11 shows the detail D of FIG 10;

FIG. 12 shows the detail E of FIG. 10;

FIG. 13 shows in a perspective view the front panel and the user interface of FIG. 4 in a state before assembly;

FIG. 14 shows in a perspective view the front panel and the user interface of FIG. 4 in an assembled state;

FIG. 15 shows in a frontal view the front panel and the user interface of FIG. 4 in an assembled state;

FIG. 16 shows a section through front panel and interfacing element along the axis B-B shown on FIG. 15;

FIG. 17 shows the detail F of FIG 16;

FIG. 18 shows the detail G of FIG. 16;

FIG. 19 shows in a perspective view the front panel and the user interface of FIG. 3 in a state before assembly;

FIG. 20 shows in a perspective view the front panel and the user interface of FIG. 3 in an assembled state;

FIG. 21 shows in a frontal view the front panel and the user interface of FIG. 3 in an assembled state;

FIG. 22 shows a section through front panel and interfacing element along the axis C-C shown on FIG. 21;

FIG. 23 shows the detail H of FIG 22;

FIG. 24 shows the detail I of FIG. 22;

FIG. 25 shows an isometric back view of user interface and interfacing element according to FIG. 2;

FIG. 26 shows an isometric back view of user interface and interfacing element according to FIG. 3;

FIG. 27 shows a detail of FIGs. 25, 26;

FIG. 28 shows an isometric back view of user interface and interfacing element according to FIG. 4;

FIG. 29 shows a detail of FIG. 28;

FIG. 30 shows front-loading washing machine with a user interface with an opening and an interfacing element and a drawer in a preferred embodiment in an explosive view;

FIG. 31 shows the front-loading washing machine according to FIG. 30 with interfacing element and drawer in their fully inserted positions

#### Detailed Description of the Invention

In FIG. 1, a laundry treatment appliance 2 is shown which is built as a front-loading washing machine and comprises a housing or casing 6 with a preferable parallelepiped shape, the casing 6 comprising a front wall 10, two side walls 14, and a cover plate 20. A front door 24 is provided which can be opened for loading or unloading laundry through an opening 28 into a washing drum.

Advantageously a washing tub is contained within the casing, whereas a rotatable and perforated drum is contained by said washing tub. Both washing tub and drum have a substantially cylindrical shape. Advantageously the tub is suspended in a floating manner inside casing 6 by means of a number of coil springs and shock absorbers. The drum is rotated by an electric motor (not shown), which transmits the rotating motion of a motor shaft to the drum by a belt/pulley system. In a different embodiment of the invention, the motor can be directly associated with the shaft of the drum. The tub is preferable connected to casing 6 by means of an elastic bellows or gasket. Alternatively, said appliance can be a dryer (in which case the tub is not provided) or a combined washer and dryer.

The preferred washing machine shown on fig.1 comprises a front panel 30 with a user interface 34, preferable with a rotatable knob 38 and /or with corresponding push buttons, and a drawer 42, which is shown in a state in which it is inserted in an opening in front panel 30. User interface 34 comprises a number of controls and/or lights or indicators (not shown), which allow the user to operate the washing machine and to receive input regarding the selected washing program and status of the machine. Knob 38 can allow by rotating to select different parameters and/or washing programs; it can be further or alternatively provided with a push function, allowing additional program selection and / or a switching-on function of the appliance / programs. Knob 38 is preferable arranged in between user interface 34 and drawer 42, and the latter can be extracted or pulled for filling it with detergent and/or softener and/or other products.

As illustrated in FIGs. 2, 3, and 4, different laundry treatment appliances 2 are provided with a front panel 30 having a user interface 34 associated with a drawers 42 of different configurations. This functionality and adaptability is realized by an interfacing element 50, 52, 54 which is preferably inserted into an opening 60 of front panel 30 and connected to front panel 30 by means which will be described below. This way, laundry treatment appliances shown in FIGs. 2, 3, and 4 comprise an identically built front panel 30. Front panel 30 is connected to casing 6, allowing the insertion of a respective drawer 42. Each laundry treatment appliance 2 provides a guiding structure 64, 66, 68 for guiding or at least for allowing the insertion of the drawer, which is adapted to the specific design of the respective drawer. Front panel 30 also provided a knob opening 70 into which knob 38 can be placed and connected to front panel 30.

In FIG. 5, front panel 30 is shown in a perspective view together with interfacing elements 50, 52, 54 from FIGs. 2, 3, 4. Interfacing element 50 is configured to receive a drawer for a washing machine which allows filling of detergents, softeners and /or further products. Also the interfacing element 52 is configured to receive a drawer for a washing machine but of a different model / type. Interfacing element 54 is configured to receive a drawer built as a tank for a tumble dryer which is designed as a condenser-type dryer, the tank collecting condensate liquid which is extracted from laundry within the dryer by a drying air flow passing through the drum.

Interfacing element 50 comprises a frame 80 comprising a recessed front side 74 with an interface opening 76 that allows insertion of a drawer. Preferable, the frame flushes with the user front panel 30 on the mounting position of said interfacing element 50; additionally, the recessed front side can be configured to allow the flush of the drawer frontal portion with said frame 80 and / or said front panel 30 in the fully inserted position of the drawer. Also, frame 80 can act in a stabilizing way of interfacing element 50.

For connecting interfacing element 50 to front panel 30, interfacing element 50 comprises several snap elements 86 which engage with front panel 30 for a removable or

a non-removable connection. Interfacing element 50 also comprises laterally arranged snap elements 90 for connecting with front panel 30.

Interfacing element 52 comprises a frame 94 which is essentially identical to frame 80 of interfacing element 50. It also comprises a recessed front side 98 with an interface opening 100, which is larger and different compared to interface opening 76, allowing the insertion of a drawer with a larger and different cross-section. Snap elements 104 on a top part 106 and snap elements 108 on a lateral part 110 allow connection of interfacing element 52 to front panel 30.

Interfacing element 54 is designed to be used in a tumble dryer of condenser type, which has a tank for the condensate which is extracted from the laundry and which needs to be emptied from time to time. The tank can be inserted and extracted through an interface opening 114. Also in this case, snap elements 116, 118 allow mounting interfacing element 54 in front panel 30. In said alternatively configuration, the interfacing element 54 comprises a front side which flushes with user front panel 30 on mounting position of said interfacing element 54.

At a bottom part 128, all three interfacing elements 50, 52, 54 respectively comprise a ridge 130 which serves as a mechanical stop when interfacing element 50, 52, 54 is inserted into front panel 30. As indicated by dashed lines 140, all three interfacing elements 50, 52, 54 fit into the identical front panel 30. In FIG. 6, front panel 30 and interfacing elements 50, 52, 54 are displayed in a frontal view.

In FIG. 7, interfacing element 50 is shown in front of front panel 30 in a position in which it can be inserted into opening 60 by moving it along dashed lines 144. In FIG. 8, front panel 30 and interfacing element 50 are shown in a mounted state, with interfacing element 50 being connected to front panel 30. In FIG. 9, this configuration is shown in a frontal view. A section A-A through front panel 30 and interfacing element 50 is displayed in FIG. 10. Letters D and E denote circles which are in a detailed view shown in FIGs. 11 and 12 and illustrate the connection mechanism for connecting interfacing element 50 with front panel 30.

As seen in FIG. 11, interfacing element 50 comprises at a top part 158 at least one connection portion which is preferable built as a snapping element 160 which – in a mounted position engages with a retainer 166 of the front panel 30, the retainer having essentially a C-shape. Alternatively, the connection portion can be built as a rigid seat with a “U” shape. In a bottom part 162, interfacing element 50 comprises a snapping element 170 which in a mounted position is located and snaps behind a retainer 176 which has a step-like shape. This snapping or clip mechanism fixes interfacing element 50 in front panel 30 in a firm way such that when a drawer is moved through opening 76 of interfacing element 50, interfacing element 50 remains in its mounting position. The described snap mechanism allows the removal of interfacing element 50 from front panel 30 in an easy-to-handle manner; said mechanism can alternatively be configured to avoid the removal of said interfacing element 50 from the panel 30, for example with a suitable dimensioning of the snap mechanism as well as of its corresponding seat.

In FIG. 13, interfacing element 54 for use in a tumble-dryer is shown in front of front panel 30, and in in FIG. 14, it is shown in a mounted or inserted position. FIG. 15 shows this configuration in a frontal view. A section B-B through front panel 30 and interfacing element 54 is displayed in FIG. 16. Letters F and G denote circles which are in a detailed view shown in FIGs. 17 and 18 and illustrate the connection mechanism for connecting interfacing element 50 with front panel 30. At a top part 180, interfacing element 54 comprises a snapping element 190 which in a mounted position engages with a retainer 194 of front panel 30, retainer 194 being essentially C-shaped. Alternatively, the connection portion can be built as a rigid seat with a “U” shape. At a bottom part 184 of interfacing element 54, in a mounted position a snapping element 200 engages with a step-shaped retainer 204.

In a similar manner, FIGs. 19, 20, and 21 show front panel 30 and interfacing element 52 before insertion and in the inserted or mounted state in a perspective and frontal views. A section C-C through front panel 30 and interfacing element 52 is displayed in FIG. 22. Letters H and I denote circles which are in a detailed view shown in FIGs. 23 and 24. The snapping mechanism for connecting interfacing element 52 to front panel 30 is the same as the one for connecting interfacing element 50 to frontal panel 30 as shown in FIGs. 10 to 12.

An isometric view back view of front panel 30 and mounted interfacing element 50 is shown in FIG. 25, and an isometric view of front panel 30 and mounted interfacing element 52 is shown in FIG. 26. In FIG. 27, a detailed view of the parts shown in a box 220 is given. Similarly, FIG. 28 shows an isometric back view of front panel 30 and interfacing element 54, while FIG. 29 shows a detail thereof.

Additional or alternative screw means (not shown) can be provided for the assembly between the interfacing element and the user interface / frontal panel; for example, but not limiting, screw means can pass at least a hole provided on the interfacing element and can be screwed on a respective receiver / hole provided on the user interface / frontal panel.

The laundry treatment appliance 2 can be assembled as follows. Interfacing element 50, 52, 54 is inserted into opening 60 and connected to the user interface 34. This is performed by pushing it in an essentially parallel manner. Snapping elements which are elastic will bend until interfacing element is fully inserted and snapping elements engage with respective retainer of user interface 34 or front panel 30. Interfacing element is then fixed against movement deeper into opening or movement away from the opening. It is still extractable if the snap elements are configured to get disengaged from the respective retainers.

In case of a connection portion built as a rigid seat, the interfacing element can be preferable assembled on the front panel 30 firstly through the insertion of said rigid seat on the retainer, followed by the tilt of said interfacing element around said seat – retainer connection and toward the front panel / user interface, until to reach the mounting position when at least an additional snapping element provided on the interfacing element and / or on the front panel is engaged with its respective seat / retainer; alternatively or additionally, screw means can be provided between the interfacing element and the front panel / user interface, to guarantee the connection thereof.

After the interfacing element and the user interface assembly, the drawer can be inserted into the interface element.

In an alternative way of assembling laundry treatment appliance 2, drawer 42 is first inserted into interfacing element 50, 52, 54, and then the combined system of drawer 42 and interfacing element is inserted into opening of user interface 50, 52, 5 to have an engagement with retainers for a firm positioning of interfacing element 50, 52, 54 in opening 60.

In FIG. 30, a laundry treatment machine 2 in another preferred embodiment is displayed comprising a casing 230 with a user interface 234 associated on an opening 232 provided on a front wall 236 of said casing 230. Casing 230 also comprises two lateral walls 238 and a back wall 240. Laundry treatment machine 2 also comprises a top plate 246. A front door 250 is provided which can be opened for loading or unloading laundry through an opening 256 into a washing drum.

Advantageously a washing tub is contained within the casing, whereas a rotatable and perforated drum is contained by said washing tub. Both washing tub and drum have preferable a substantially cylindrical shape. The tub is preferable suspended in a floating manner inside casing by means of a number of coil springs and shock absorbers (not shown). The drum is rotated by an electric motor (not shown), which transmits the rotating motion of a motor shaft to the drum preferable by a belt/pulley system. In a different embodiment of the invention, the motor can be directly associated with the shaft of the drum. The tub is preferable connected to casing by means of an elastic bellows or gasket.

Casing 230 comprises an opening 296 for receiving a drawer 300. An additional and separate interfacing element 306 is provided, which is connected to casing 230 in association with this opening 296. The interfacing element 306 is configured for insertion/extraction of drawer 300.

Preferable, around the openings 232 and 296 for the user interface 234 and the interfacing element 306 assembly, a recessed portion is provided, with a shape and a depth configured to allow the flush of said user interface 234 and / or said interfacing element 306 with each other and / or with the front wall 236 of the casing 230.

Said interfacing element 306 can be preferable configured as the embodiments above described and shown in FIGs. 2 to 29, as well as the combination of the assembly means, such as the connection portion / snapping means cooperating with the retainer, the screw means etc., suitable for the removable or the non-removable connection between the interfacing element and the front wall.

Preferred configurations of the interfacing element associable with the opening 296 of the casing 230 shown on FIG. 30 are shown on FIG. 5, in a perspective view. Interfacing element 50 is configured to receive a drawer for a washing machine which allows filling of detergents, softeners and /or further products. Also the interfacing element 52 is configured to receive a drawer for a washing machine but of a different model / type. Interfacing element 54 is configured to receive a drawer built as a tank for a tumble dryer which is designed as a condenser-type dryer, the tank collecting condensate liquid which is extracted from laundry within the dryer by a drying air flow passing through the drum.

Interfacing element 50 comprises a frame 80 comprising a recessed front side 74 with an interface opening 76 that allows insertion of a drawer. Preferable, the frame flush with the front wall 236 of casing 230 and / or with the user interface 234 on the mounting position of said interfacing element 50; additionally, the recessed position of the front side can be configured to allow the flush of the drawer frontal portion with said frame 80 and / or the front wall 236 and / or with the user interface 234 in the fully inserted position of the drawer. Moreover, the frame 80 can act in a stabilizing way of interfacing element 50.

For connecting interfacing element 50 to front wall 236 of casing 230, interfacing element 50 comprises several snap elements 86 which engage with front wall 236 of casing 230 for a removable or a non-removable connection. Interfacing element 50 also comprises laterally arranged snap elements 90 for connecting with said front wall 236.

Interfacing element 52 comprises a frame 94 which is essentially identical to frame 80 of interfacing element 50. It also comprises a recessed front side 98 with an interface opening 100, which is larger and different compared to interface opening 76,

allowing for the insertion of a drawer with a larger and different cross-section. Snap elements 104 on a top part 106 and snap elements 108 on a lateral part 110 allow connection of interfacing element 52 to front wall 236 of casing 230.

Interfacing element 54 is designed to be used in a tumble dryer of condenser type, which has a tank for the condensate which is extracted from the laundry and which needs to be emptied from time to time. The tank can be inserted and extracted through an interface opening 114. Also in this case, snap elements 116, 118 allow mounting interfacing element 54 in front wall 236 of casing 230. In said alternatively configuration, the interfacing element 54 comprises a front side which flushes with front wall 236 of casing 230 and / or user interface front wall on mounting position of said interfacing element 54.

At a bottom part 128, all three interfacing elements 50, 52, 54 respectively comprise a ridge 130 which serves as a mechanical stop when interfacing element 50, 52, 54 is inserted into front wall 236 of casing 230.

Alternative configurations of the interfacing element associable with the opening 296 of the casing 230 shown on FIG. 30 are shown on FIG. 10, 11 and 12 illustrating the connection mechanism.

As seen in FIG. 11, interfacing element 50 comprises at a top part 158 at least one connection portion which is preferable built as a snapping element 160 which – in a mounted position engages with a retainer 166 of the front panel 30 (that is equivalent to the front wall 236 of casing 230), the retainer having essentially a C-shape. Alternatively, the connection portion can be built as a rigid seat with a “U” shape. In a bottom part 162, interfacing element 50 comprises a snapping element 170 which in a mounted position is located and snaps behind a retainer 176 which has a step-like shape, the latter being preferably provided on the opening 296 (see FIG. 30). This snapping or clip mechanism fixes interfacing element 50 in the front wall 236 of casing 230 in a firm way such that when a drawer is moved through opening 76 of interfacing element 50, interfacing element 50 remains in its mounting position. The described snap mechanism allows the removal of interfacing element 50 from the front wall 236 of casing 230 in an easy-to-handle manner; said mechanism can alternative-

ly be configured to avoid the removal of said interfacing element 50, for example with a suitable dimensioning of the snap mechanism as well as its corresponding seat.

Further alternative configurations of the interfacing element associable with the opening 296 of the casing 230 shown on FIG. 30 are shown on FIG: 16, 17, 18, said interfacing element being preferable configured for use in a tumble-dryer. At a top part 180, interfacing element 54 comprises a snapping element 190 which in a mounted position engages with a retainer 194 of front panel 30 (that it is equivalent to the front wall 236 of the casing 230), retainer 194 being essentially C-shaped. At a bottom part 184 of interfacing element 54, in a mounted position a snapping element 200 engages with a step-shaped retainer 204, the latter being preferably provided on the opening 296 (see FIG. 30).

In a similar manner, FIGs. 22, 23, and 24 show an alternative configuration of the interfacing element 52, preferable configured for an alternative model of washing machine. The snapping mechanism for connecting interfacing element 52 to front panel 30 (that it is equivalent to the front wall 236 of the casing 230) is the same as the one for connecting interfacing element 50 to frontal panel 30 as shown in FIGs. 10 to 12.

Additional or alternative screw means (not shown) can be provided for the assembly between the interfacing element and the front wall 236 of casing 230; for example, but not limiting, screw means can pass at least a hole provided on the interfacing element and can be screwed on a respective receiver / hole provided on the front wall 236.

The laundry treatment appliance 2 can be assembled as follows. Interfacing element 50, 52, 54 as shown on figures 5 to 24 is inserted into opening 296 and connected to the front wall 236 of casing 230. This is performed by pushing it in an essentially parallel manner. Snapping elements which are elastic will bend until interfacing element is fully inserted and snapping elements engage with respective retainer of front wall 236. Interfacing element is then fixed against movement deeper into opening or movement away from the opening. It is still extractable if the snap elements are configured to get disengaged from the respective retainers.

In case of a connection portion built as a rigid seat, the interfacing element can be preferable assembled on the front wall 236 of casing 230 firstly through the insertion of said rigid seat on the retainer, followed by the tilt of said interfacing element around said seat – retainer connection and toward the front wall 236, until to reach the mounting position when at least an additional snapping element provided on the interfacing element and / or on the front wall 236 of casing 230 is engaged with its respective seat /retainer; alternatively or additionally, screw means can be provided between the interfacing element and the front wall 236 of casing 230, to guarantee the connection thereof.

After the interfacing element and the user interface assembly, the drawer can be inserted into the interface element.

In an alternative way of assembling laundry treatment appliance 2, drawer 42 is first inserted into interfacing element 50, 52, 54, and then the combined system of drawer 42 and interfacing element is inserted into the opening 296 to have an engagement with retainers for a firm positioning of interfacing element 50, 52, 54 in opening 296.

In the present embodiment of the invention, user interface 234 and the opening 296 for drawer insertion/extraction are positioned adjacent to each other on a front side of the laundry treatment appliance. In other preferred embodiments, user interface 234 and opening 296 need not be arranged next to each other. The opening 296 can, in a preferred embodiment, be arranged on a lateral side of casing 230. This configuration yields more space for the user interface 234 or other components on the front wall 236.

The invention thus conceived can be subjected to numerous modifications and variants all falling within the scope of the inventive concept.

For example, the above described preferred embodiments concerning the connection means between the interfacing element and the user interface / frontal panel / front wall can be combined by a skilled person depending of the dimension / mechanic / shape constrains of each single appliance; for example, but not limiting, the connection means between the interfacing element and the user interface / frontal panel /

front wall can comprise one or more rigid connection portion on a side of the interfacing element, and at least one snapping element on at least another side.

Moreover, although on the disclosed embodiments the connection portions / snapping elements have been provided on the interfacing elements and the retainers have been provided on the front panels / user interfaces / front wall, said connection means can be at least partially reversed, i.e. providing the connection portions / snapping elements on the front panel / user interface / front wall and providing the retainers on the interfacing element.

In addition, all details can be replaced by other technically equivalent elements. In practice, all the materials used, as well as the shapes and contingent dimensions, may vary depending on the requirements without departing from the scope of protection of the following claims.

## Claims

1. Laundry treatment appliance (2), comprising a casing (6) and a user interface (34) which comprises an opening (60) for receiving a drawer (42),  
**characterized in that**  
a further interfacing element (50, 52, 54) is provided, which is connected to said user interface (34) in association with said opening (60), whereby said interfacing element (50, 52, 54) is configured for insertion and/or extraction of said drawer (42).
2. Laundry treatment appliance (2) according to claim 1, whereby said casing (6) comprises a front panel (30) with a user interface (34), which on a front wall comprises an opening (60), said interfacing element (50, 52, 54) being connected to said front panel (30) in association with said opening (60).
3. Laundry treatment appliance (2) according to claim 1 or 2, whereby said interfacing element (50, 52, 54) comprises an interface opening (76, 100, 114) for insertion and / or extraction of said drawer (42).
4. Laundry treatment appliance (2) according to one of the claims 1 to 3, whereby said interfacing element (54) comprises a front side flushing with the user interface front wall on mounting position of said interfacing element (54).
5. Laundry treatment appliance (2) according to one of the claims 1 to 3, whereby said interfacing element (50, 52) comprises a frame (80) comprising a recessed front side (74, 98) having the interfacing opening (76, 100).
6. Laundry treatment appliance (2) according to one of claims 1 to 5, whereby said interfacing element (50, 52, 54) is connected to said user interface (34) and / or said front panel (30) by a clip or snap mechanism.
7. Laundry treatment appliance (2) according to claim 6, whereby said user interface (34) and/or said front panel (30) and/or said interfacing element (50, 52,

- 54) comprise at least one snapping element (86, 90, 160, 170), said snapping element (86, 90, 160, 170) being configured to engage said interfacing element (50) with said user interface (34) and/or with said front panel (30).
8. Laundry treatment appliance (2) according to claim 6 or 7, whereby said interfacing element (50) comprises at least one connection portion and said user interface (34) and/or said front panel (30) comprises at least one retainer or vice versa, said connection portion and said retainer being configured to engage with each other.
9. Laundry treatment appliance (2) according to claim 8, whereby said at least one retainer has an essentially C-shaped form.
10. Laundry treatment appliance (2) according to claim 8, whereby said at least one connection portion is configured as a snapping element (86, 90, 160, 170).
11. Laundry treatment appliance (2) according to claim 1, whereby said interfacing element (50) is built as a cover, at least partially covering said opening (60).
12. Laundry treatment appliance (2), comprising a casing (230) with a user interface (18) and an opening (296) for receiving a drawer (300), whereby a further interfacing element (306) is provided, which is connected to said casing (230) in association with said opening (296), said interfacing element (306) being configured for insertion/extraction of said drawer (300).
13. Method for assembling a laundry treatment appliance (2), the appliance (2) comprising a casing (6) and a user interface (34) comprising an opening (60) for connecting an interfacing element (50, 52, 54), said interfacing element (50, 52, 54) comprising an interface opening (76, 100, 114) for insertion / extraction of a drawer (42), the method comprising the step of
- inserting an interfacing element (50, 52, 54) into said opening (60) and connecting said interfacing element (50, 52, 54) to said user interface (34).

14. Method according to claim 13, with the additional step of

- inserting a drawer (42) into said interface opening (76, 100, 114).

15. Method for assembling a laundry treatment appliance (2), the appliance (2) comprising a casing (6) and a user interface (34) comprising an opening (60) for connecting an interfacing element (50, 52, 54), said interfacing element (50, 52, 54) comprising an interface opening (76) for insertion / extraction of a drawer (42), the method comprising the steps of

- inserting a drawer (42) into said interfacing element (50, 52, 54);
- connecting said interfacing element (50, 52, 54) to said user interface (34) while said drawer (42) stays inserted into said interfacing element (50, 52, 54).

FIG. 1

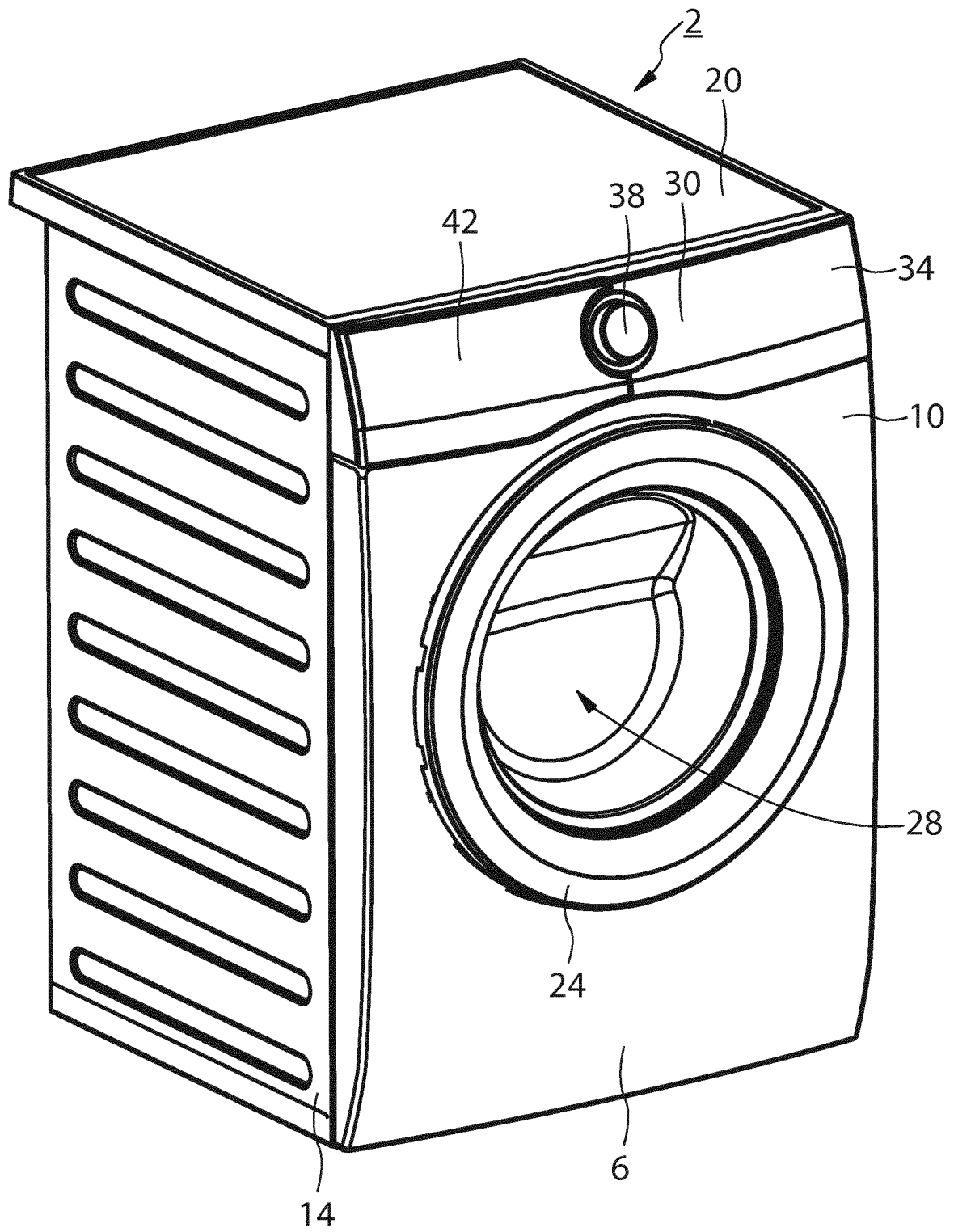


FIG. 2

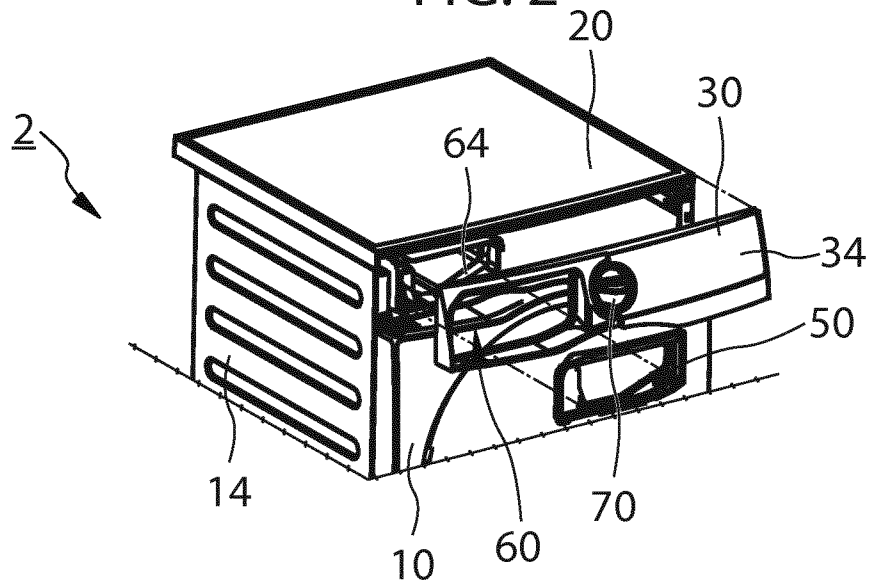


FIG. 3

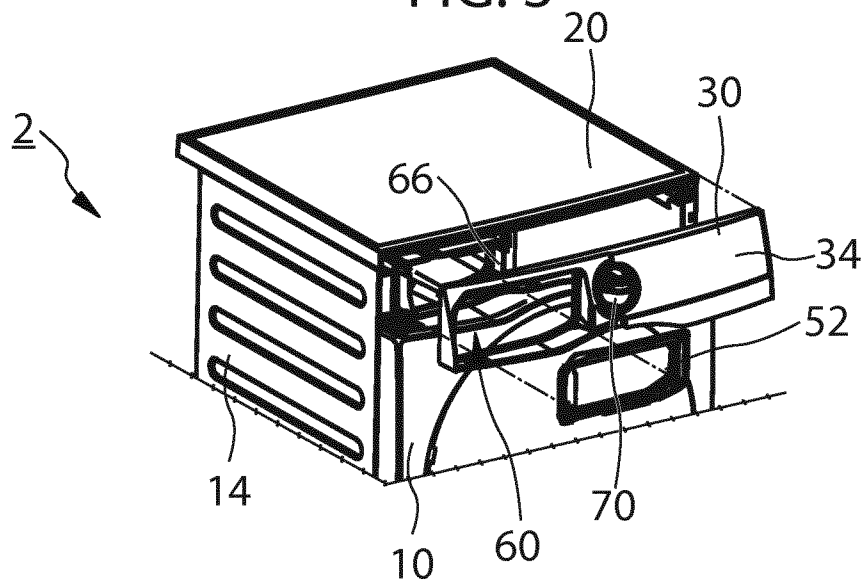


FIG. 4

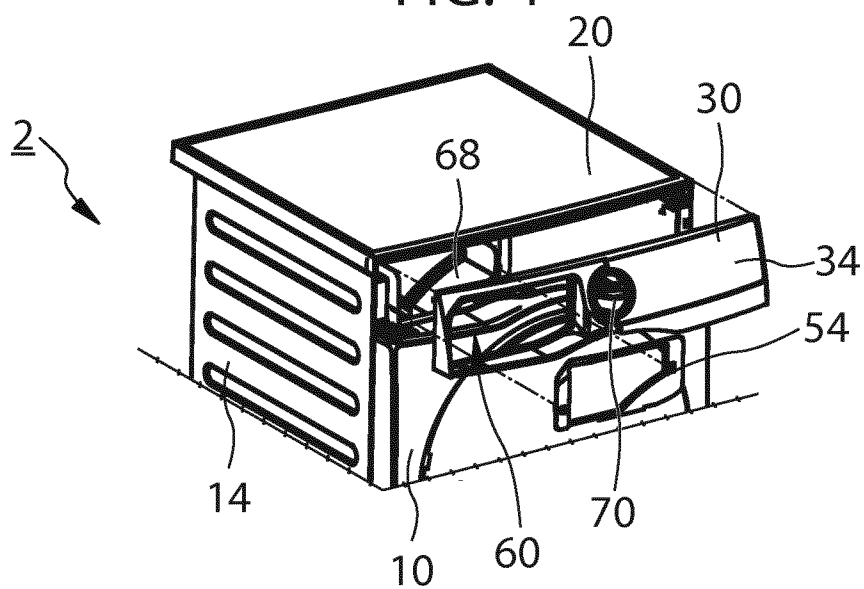


FIG. 5

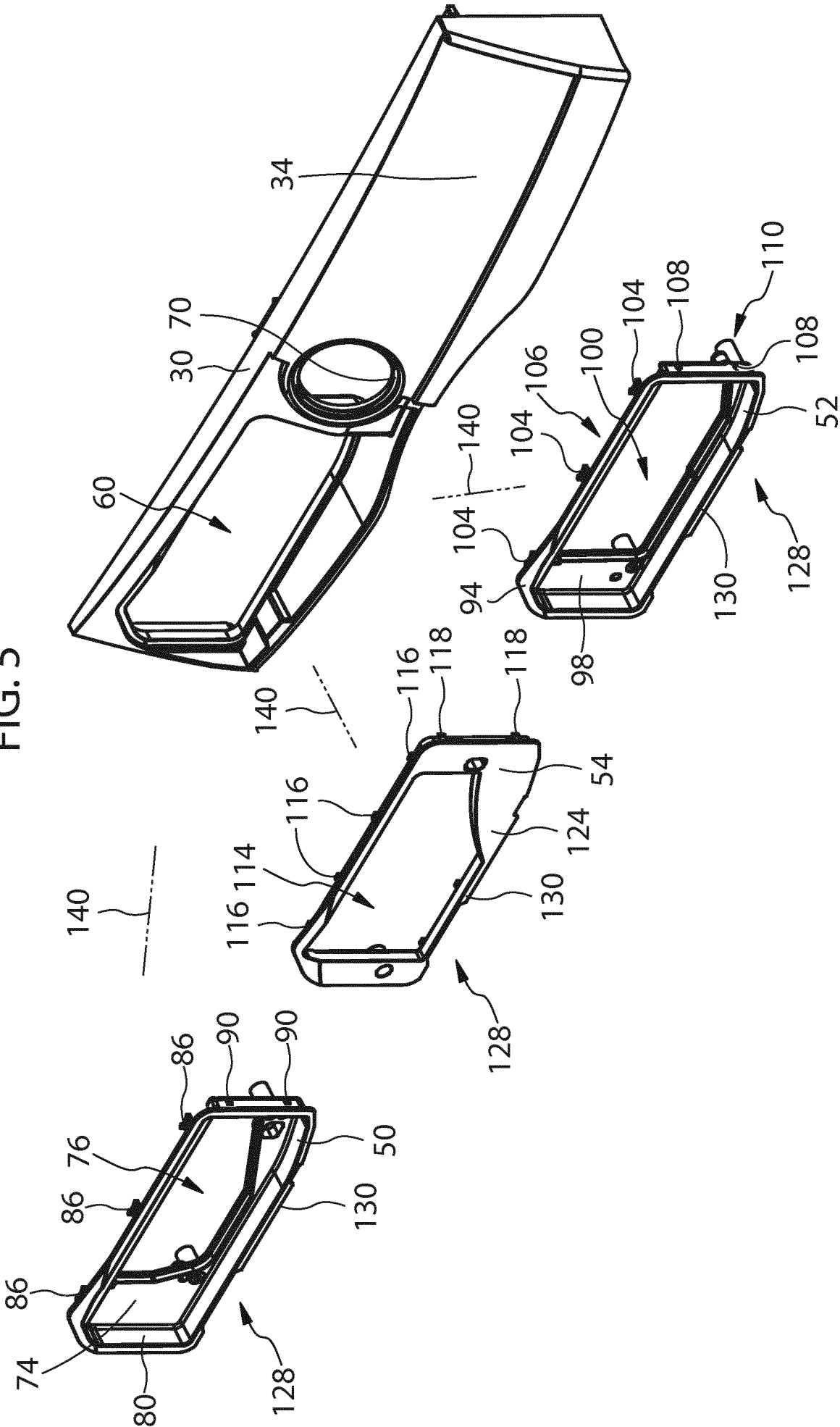


FIG. 6

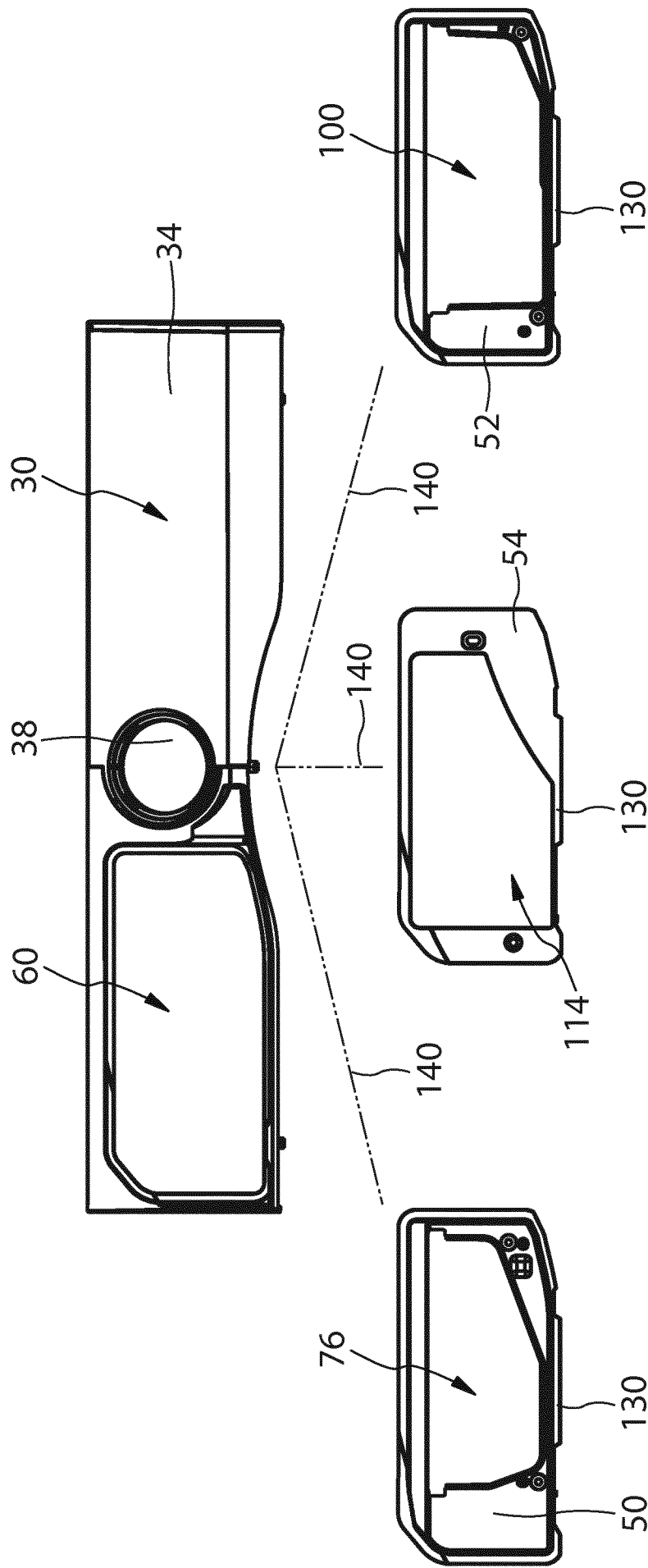


FIG. 7

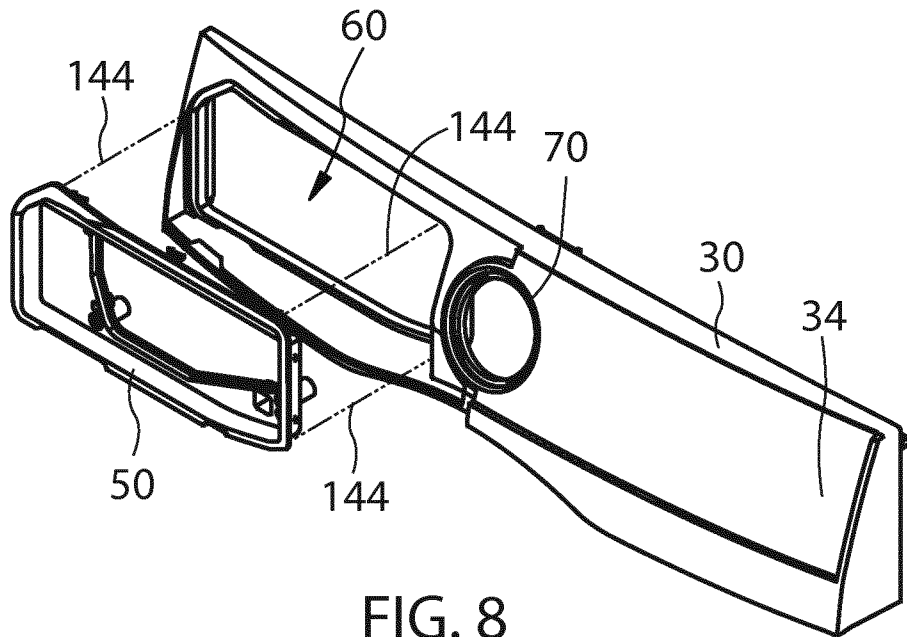


FIG. 8

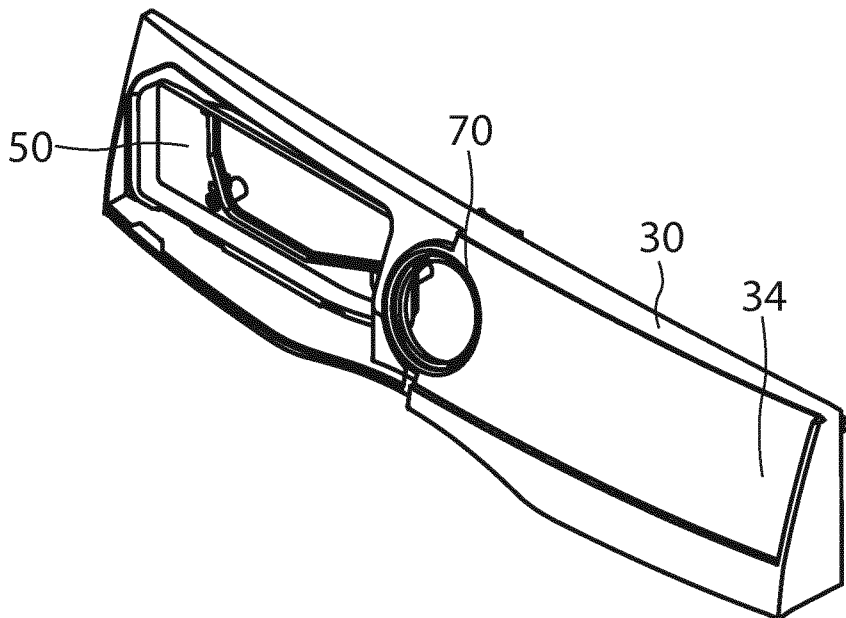


FIG. 9

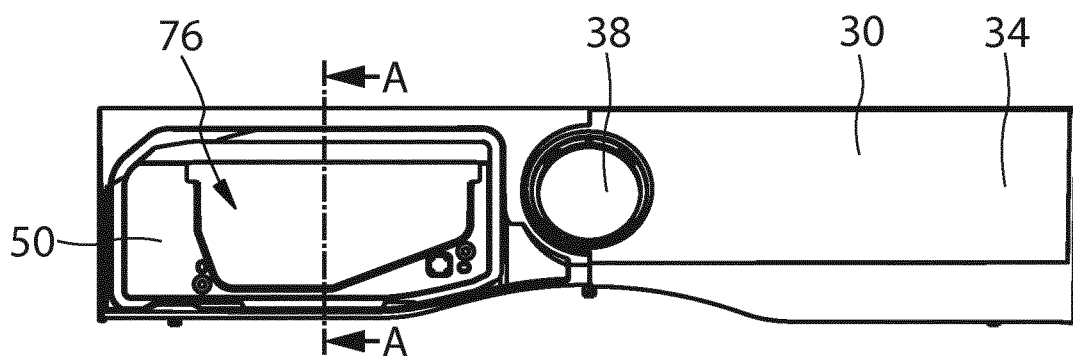


FIG. 11

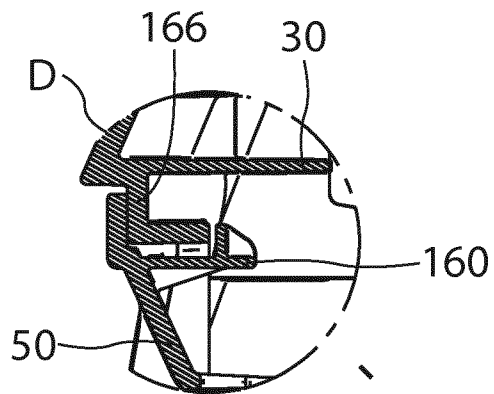


FIG. 10

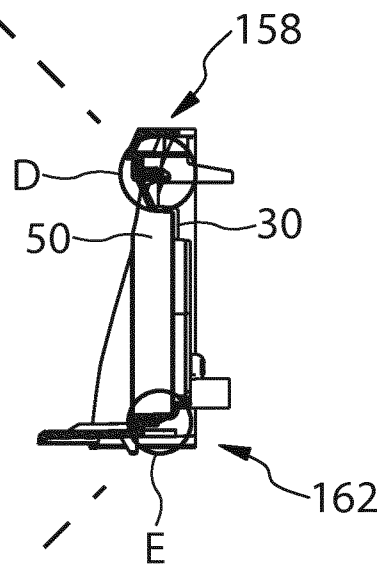


FIG. 12

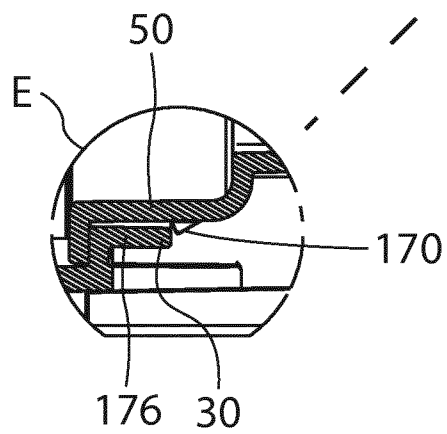


FIG. 13

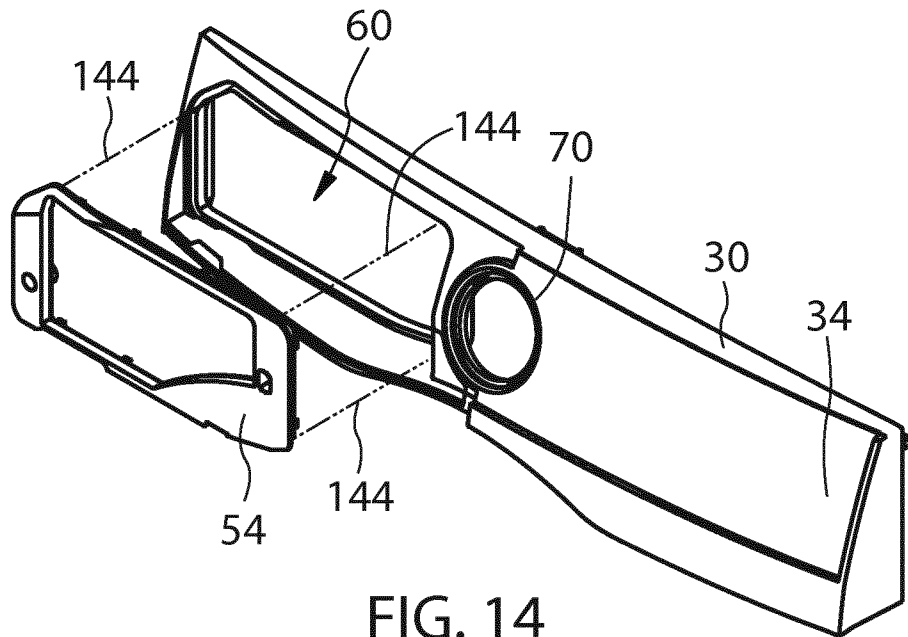


FIG. 14

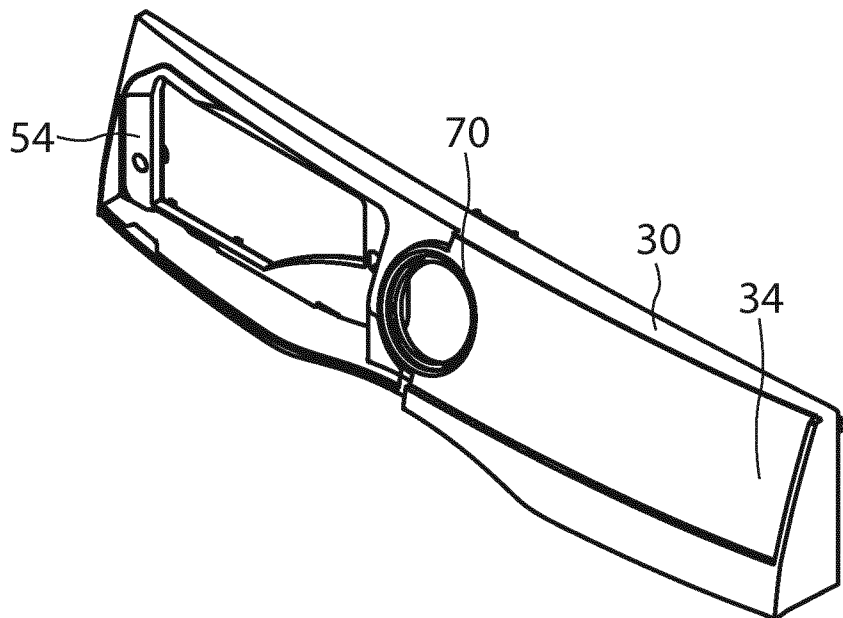


FIG. 15

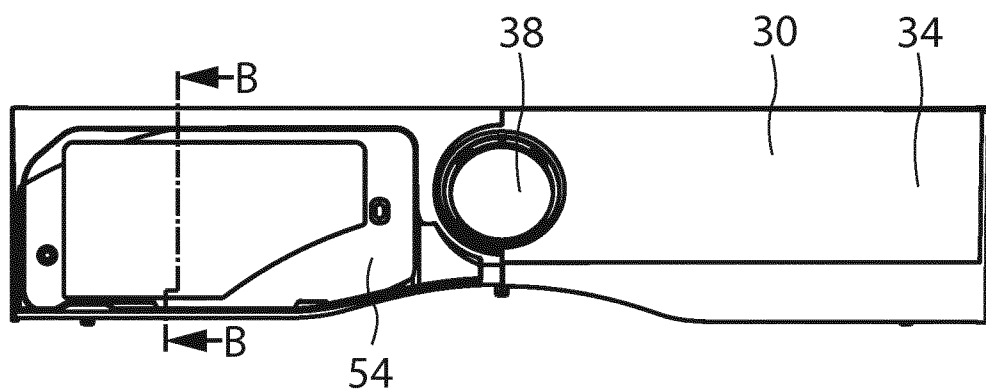


FIG. 17

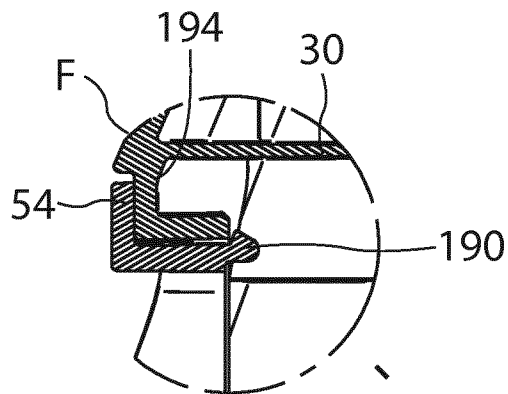


FIG. 16

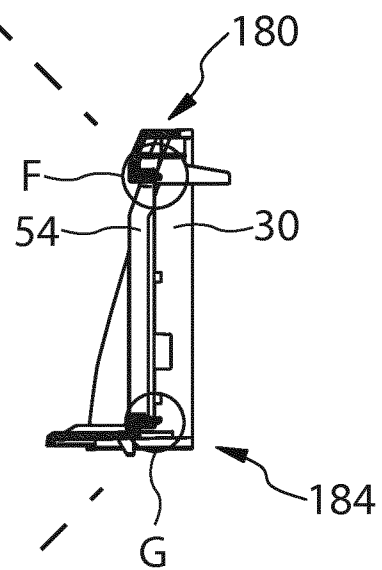


FIG. 18

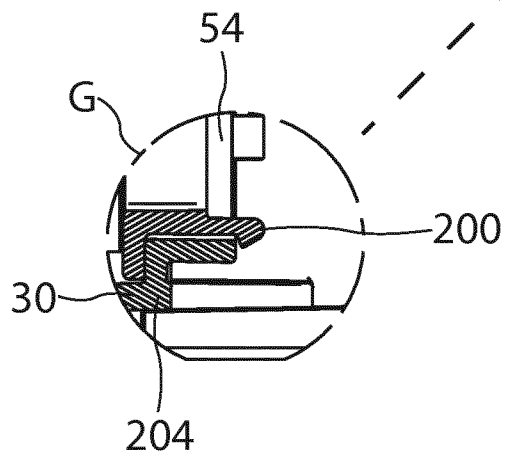


FIG. 19

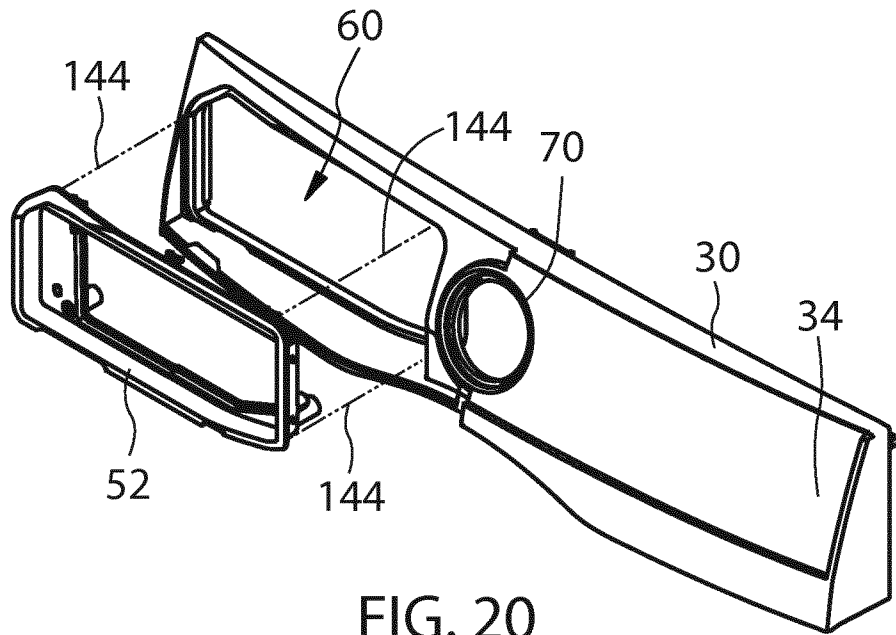


FIG. 20

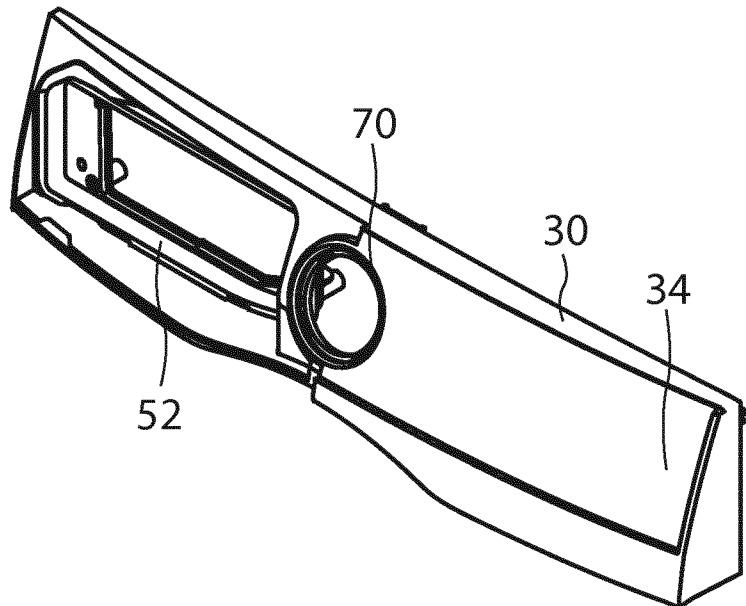


FIG. 21

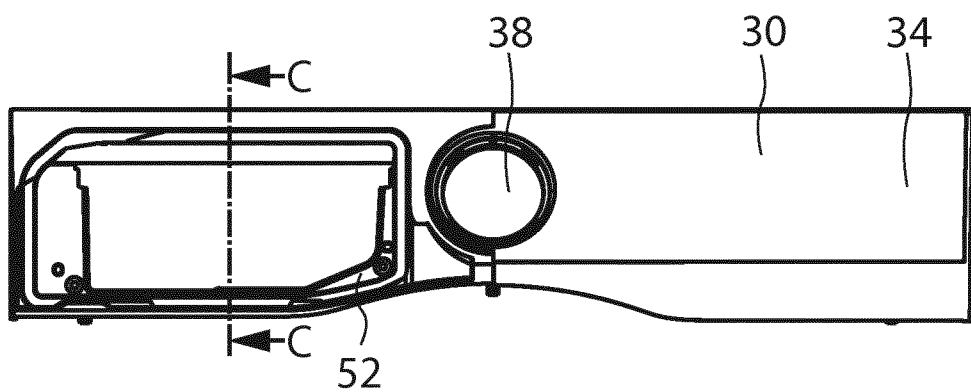


FIG. 23

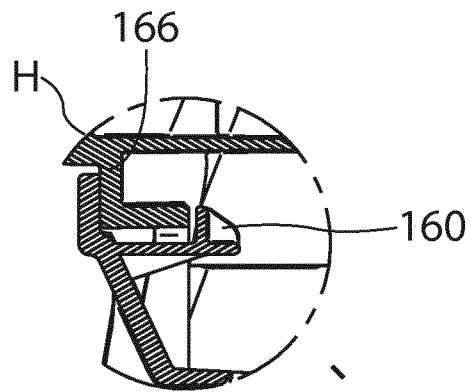


FIG. 22

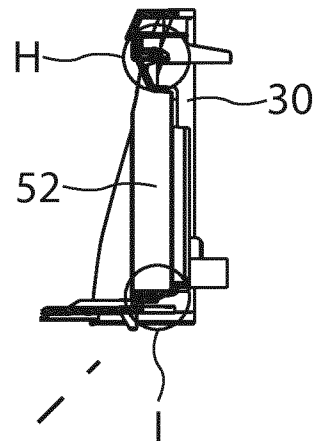


FIG. 24

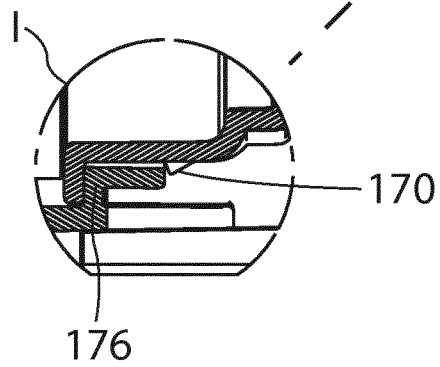


FIG. 25

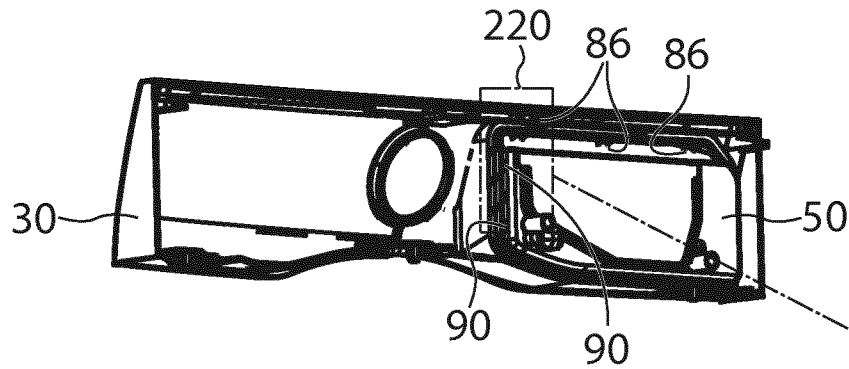


FIG. 27

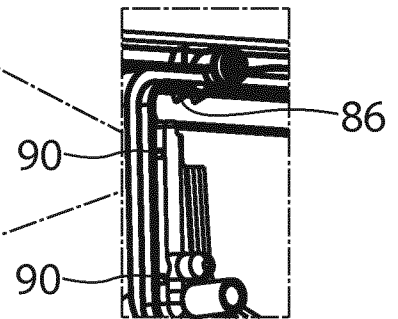


FIG. 26

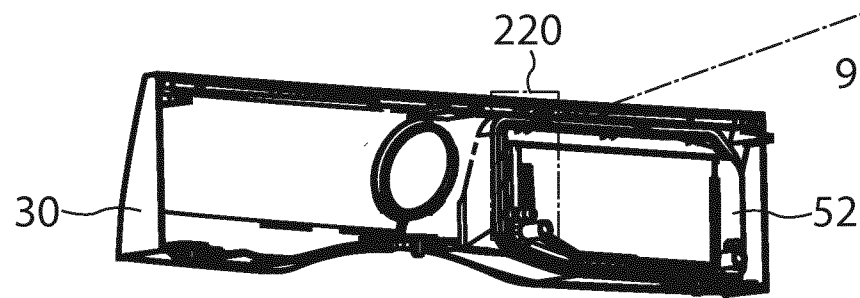


FIG. 29

FIG. 28

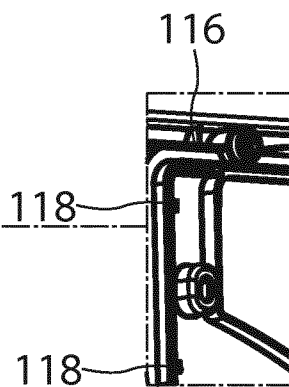
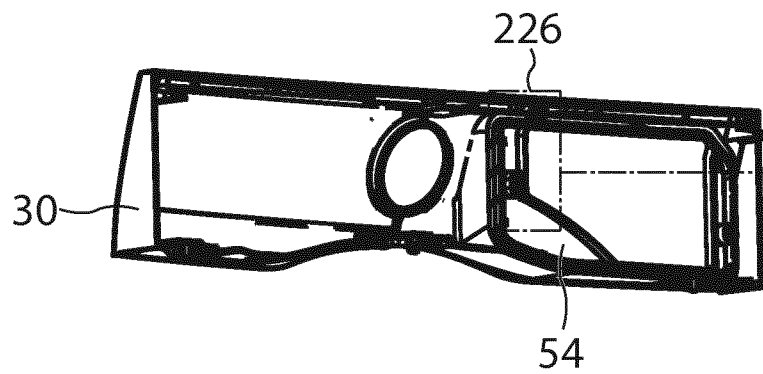


FIG. 31

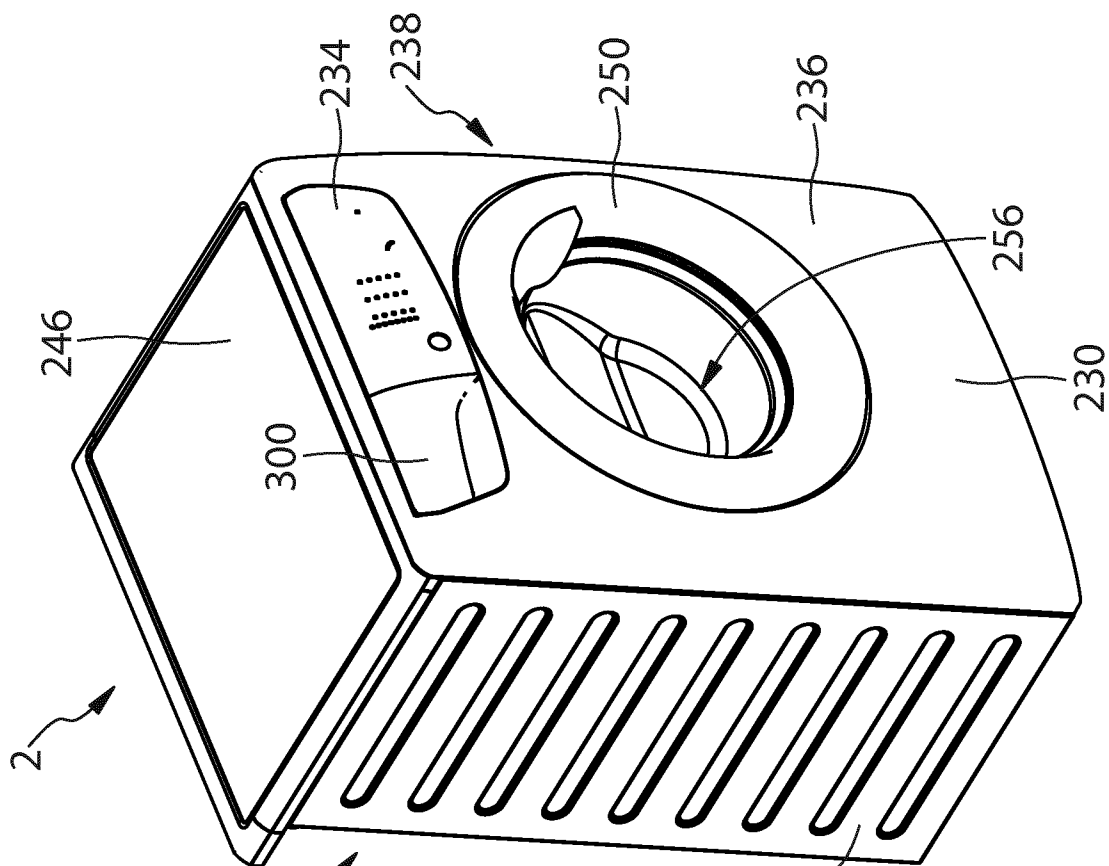
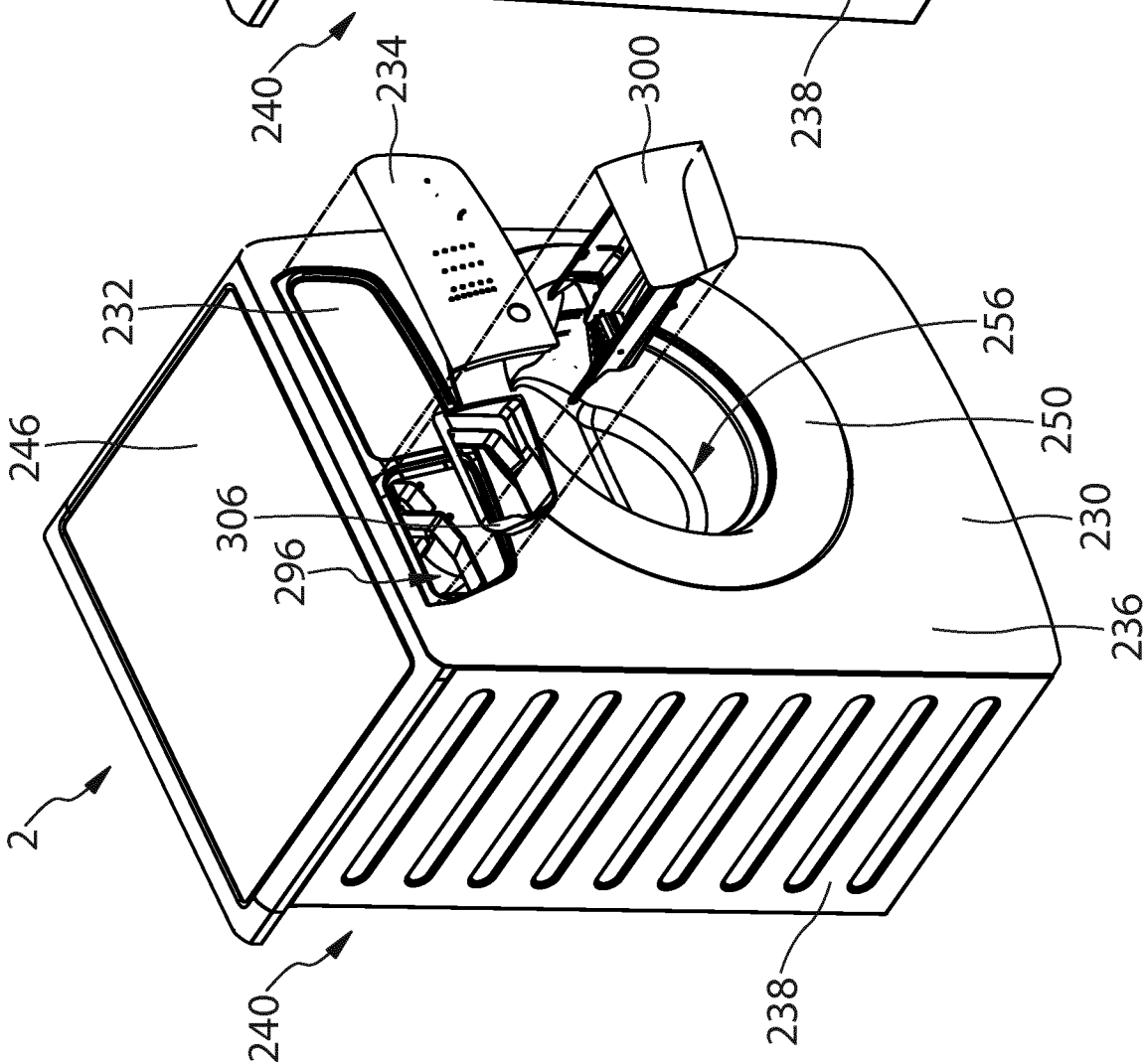


FIG. 30



# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2016/054064

## A. CLASSIFICATION OF SUBJECT MATTER

INV. D06F39/00 D06F39/02 D06F39/12  
ADD.

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)  
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 practicable, search terms used)

EP0-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.



See patent family annex.

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"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

19 April 2016

Date of mailing of the international search report

28/04/2016

Name and mailing address of the ISA/

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Fax: (+31-70) 340-3016

Authorized officer

Prosig, Christina

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2016/054064

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                            | Relevant to claim No. |
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Information on patent family members

International application No

PCT/EP2016/054064

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
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