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(54) **A LAUNDRY DRYER PROVIDED WITH A STEAM GENERATOR**

(57) A laundry dryer (1) comprising:

- a cabinet (2);
- a laundry treating compartment (5);
- a drying system (9) comprising an air conduit (10), an air moving device (11), an air heating device (13);
- a steam generator (18) comprising a main liquid reservoir (19) and a liquid heating device (20);
- a liquid loading unit (23) comprising a liquid receiving element (24), having an outlet opening (25), and a filter (26).

wherein the liquid loading unit (23) comprises a lid (27), movable with respect to the liquid receiving element (24) between a closed position, in which the lid (27) at least partially overlaps the filter (26), preventing a user from reaching the latter, and an opened position, wherein the liquid loading unit (23) comprises one or more liquid loading openings (28, 31) allowing to load a liquid in the liquid receiving element (24) even when the lid (27) is in the closed position.

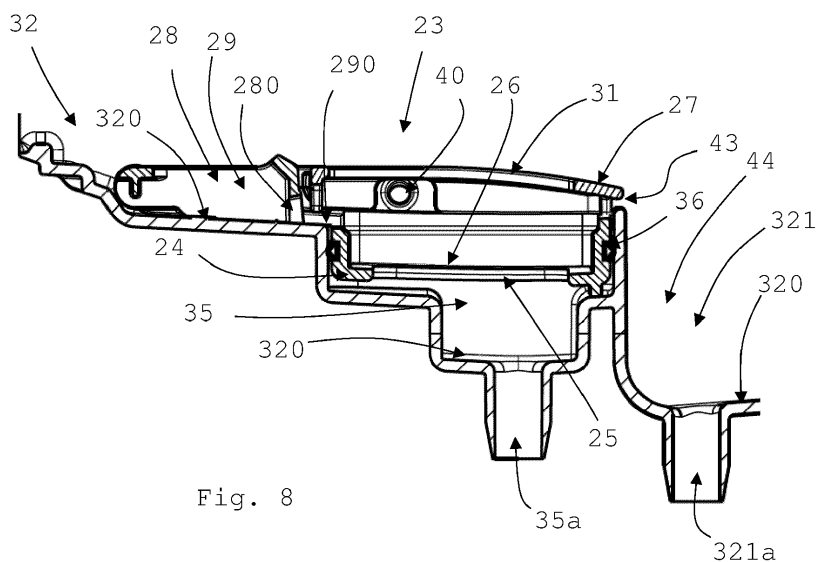


Fig. 8

Description

[0001] The present invention refers to a laundry drier provided with a steam generator.

[0002] Known laundry driers, for example tumble driers, or washer-driers (i.e. laundry appliances that can both wash and dry the laundry), typically comprise a casing, or housing, containing a laundry treating compartment wherein laundry to be treated can be loaded.

[0003] In tumble driers and washer-driers, the laundry treating compartment is typically a rotatable drum, housed inside the casing, and rotatable with respect to a rotation axis that can be, with respect to a horizontal surface on which the laundry drier is configured to lay, substantially horizontal or slightly inclined (in the so called "horizontal axis" laundry driers), or substantially vertical (in the so called "vertical axis" laundry driers).

[0004] In known tumble driers, the drum is generally rotatably supported in the casing by rollers, pivoted to a supporting structure static with respect to the casing.

[0005] In known washer-driers, the casing also houses a washing tub, typically suspended to the casing by springs and dampers, in which the drum is rotatably contained.

[0006] In other known laundry driers, the laundry treating compartment is static with respect to the casing; in this case, the laundry drier, typically called "drying cabinet", is a sort of heated cabinet wherein the laundry can be hung in order to be dried.

[0007] Known laundry driers also comprise a drying system comprising an air conduit, passing through and comprising the laundry treating compartment, an air moving device (typically a fan or blower), generating, when operated, an air flow which passes through the air conduit, an air heating device (e.g. an electric heater, a heat pump system, a gas burner), positioned at least partially within the air conduit so as to heat the air flow before it passes through the laundry treating compartment.

[0008] In some known laundry driers, the air conduit is arranged in such a way that the air flow, after passing through the laundry treating compartment, is discharged to the external environment, optionally after being at least partially deprived of moisture in a moisture condensing device (e.g. an air-air heat exchanger).

[0009] In other known laundry driers, the air conduit is arranged in such a way to circulate the airflow through the laundry treating compartment; in this case, moisture laden air exiting the laundry treating compartment is deprived of moisture in a moisture condensing device, and then heated again by the air heating device before being pumped again into the laundry treating compartment.

[0010] Some known laundry driers also comprise a steam generator, allowing to produce steam and release it within the inner volume of the laundry treating compartment, so as to contact the laundry contained therein and exert on the latter one or more advantageous actions (for example a disinfecting actions and/or an anti-crease actions, etc.).

[0011] It is underlined that in the present application the word "steam" means the gas or vapour into which water, or a liquid containing water mixed with one or more additives (e.g. a fragrance), is changed when boiled.

[0012] The steam generator typically comprises a main liquid reservoir, wherein a liquid (i.e. water or water mixed with one or more additives) can be loaded, and a liquid heating system, operable for generating heat to heat the liquid, so as to produce steam which is delivered to the laundry treating compartment via a steam delivery conduit fluidly connecting the steam generator to the laundry treating compartment.

[0013] In some known laundry driers, the main liquid reservoir is a boiler, housed within the casing externally to the laundry treating compartment, in which a liquid can be loaded and heated, and the liquid heating device is an electric heater arranged in the boiler for heating such a liquid and producing steam, which is driven towards and released into the inner volume of the laundry treating compartment via the steam delivery conduit.

[0014] In other known laundry driers, the liquid heating device is external to the main liquid reservoir, and it is arranged in such a way to heat the liquid after it exits the main liquid reservoir; for example, the liquid heating device can be an electric heater placed within a pipe fluidly connecting the main liquid reservoir to the laundry treating compartment, so as to heat a liquid exiting the main liquid reservoir and passing through such a pipe, and to convert it into steam, that is released into the laundry treating compartment.

[0015] In some known laundry driers, the liquid to be converted into steam is loaded into the main liquid reservoir via a liquid loading unit which comprises a liquid receiving element, having an outlet opening fluidly connected to the main liquid reservoir, and a filter, provided upstream to or at the outlet opening, so as to filter a liquid flowing out of the liquid receiving element via the outlet opening.

[0016] A known solution of this kind is shown in the international patent application n. WO2014/075848, disclosing a laundry washing and/or drying machine comprising a body, a steam generator situated in the body and generating steam to be delivered into the washing tub, a receptacle situated inside or in vicinity of the steam generator and wherein liquid is accumulated to be used in the steam generator, an opening arranged on the body and wherein the condensation tank, the detergent dispenser, etc. are placed, a funnel situated in the body, accessed by means of the opening and into which the liquid is delivered, and a hose providing the liquid in the funnel to be transferred to the receptacle. In this known solution, a cover is placed onto the funnel, having an open position and a closed position. When the user brings the cover from the closed position to the open position, the cover extends from the funnel towards the opening, so that, when the user pours liquid onto the cover, the liquid is delivered to the funnel by means of the cover. This known solution comprises a filter casing, detachably

mounted into the funnel, and a filter situated at the base of the filter casing for filtering the liquid delivered to the hose by passing through the filter casing. The filter, the cover and the filter casing can move together in an integrated manner. The filter casing placed into the funnel can be dislodged from the funnel by the user and cleaned when desired.

[0017] This known solution has however a drawback; in fact, in order to load the liquid, the user must bring the cover in the open position, which can be not comfortable and can require a certain execution time.

[0018] In addition, if the cover, after loading the liquid, is not properly closed, there is the risk that the component (i.e. the condensation tank or the detergent dispenser of the laundry washing and/or drying machine) to be placed in the opening via which the funnel can be accessed, can bump into the cover while being inserted into the opening, with the risk of damaging the cover and/or the component.

[0019] The aim of the present invention is therefore to provide a laundry drier provided with a steam generator which simplifies, with respect to cited prior art, the manual loading of a liquid to be converted into steam into such a steam generator.

[0020] Within this aim, a further object of the invention is obtaining a laundry drier provided with a steam generator in which the risk of possible damages caused by the operations for manually loading a liquid to be converted into steam into such a steam generator is low.

[0021] Applicant has found that, by using, for manually loading a liquid into the steam generator, a liquid loading unit provided with a filter and with a lid selectively closable/openable for respectively preventing/allowing to reach such a filter, and provided with one or more liquid loading openings allowing to manually load a liquid in the liquid receiving element even when the lid is closed, the loading procedure is very easy and quick.

[0022] In particular, above aim and objects are solved by a laundry dryer comprising:

- a casing;
- a laundry treating compartment, mounted within the casing, wherein laundry to be treated can be loaded;
- a drying system comprising an air conduit, passing through and comprising the laundry treating compartment, an air moving device, generating, when operated, an air flow which passes through the air conduit, an air heating device, positioned at least partially within the air conduit so as to heat the air flow before it passes through the laundry treating compartment;
- a steam generator comprising a main liquid reservoir, wherein a liquid can be loaded, and a liquid heating device, operable for generating heat to heat a liquid contained in and/or coming from the main

liquid reservoir, so as to produce steam which is delivered to the laundry treating compartment via a steam delivery conduit fluidly connecting the steam generator to the laundry treating compartment;

- a liquid loading unit comprising a liquid receiving element, having an outlet opening, fluidly connected or connectable to the main liquid reservoir, and a filter, provided upstream to or at the outlet opening, so as to filter a liquid flowing out of the liquid receiving element via the outlet opening,

wherein the liquid loading unit comprises a lid, movable with respect to the liquid receiving element between a closed position, in which the lid at least partially overlaps the filter, preventing a user from reaching the latter, and an opened position allowing a user to reach the filter, wherein the liquid loading unit comprises one or more liquid loading openings allowing to manually load a liquid in the liquid receiving element even when the lid is in the closed position.

[0023] In an advantageous embodiment, the filter is removably associated to the liquid receiving element.

[0024] It is underlined that the expression "reaching" the filter has to be construed as accessing the filter in a way suitable for completely cleaning the latter and/or for grasping the filter in such a way to be able to remove it, if removable, for cleaning or replacing it.

[0025] In the same way, the expression "preventing a user from reaching" the filter has to be construed as avoiding that a user can access the filter in such a way to completely clean the latter or to grasp such a filter in such a way to remove it, if removable, for cleaning or replacing it.

[0026] It is underlined, in particular, that, according to the invention, the expression "reaching the filter" does not encompass slightly touching the filter, nor touching only a small portion of the latter.

[0027] In an advantageous embodiment, the one or more liquid loading openings comprise a first liquid loading opening provided at the liquid receiving element and fluidly connected to the outlet opening via a fluid path bypassing the lid and passing through the filter.

[0028] In an advantageous embodiment, the first liquid loading opening is provided in the liquid receiving element.

[0029] Preferably, the liquid receiving element is box shaped and hollow.

[0030] In an advantageous embodiment, the liquid receiving element comprises an hopper, in which the outlet opening and the first liquid loading opening are provided, wherein the outlet opening and the first liquid loading opening are fluidly connected to one another.

[0031] In an advantageous embodiment, the first liquid loading opening and the outlet opening are fluidly connected to one another via a connecting conduit provided at least partially in the hopper.

[0032] In a further advantageous embodiment, the first

liquid loading opening and the outlet opening are defined by two portions of a same aperture provided in the liquid receiving element; preferably, in this advantageous embodiment, the first liquid loading opening, the outlet opening, and the filter are reciprocally positioned in such a way that, when the lid is in the closed position, it at least partially overlaps the filter and delimits the first loading opening in such a to prevent a user from reaching the filter via the first loading aperture.

[0033] In a preferred embodiment, the filter overlaps the outlet opening so that the filter and the outlet opening are aligned with each other, while the first liquid loading opening is misaligned with respect to the filter and the outlet opening.

[0034] In a further advantageous embodiment, the dimensions of the first liquid loading opening are so small that a user can't insert a finger within such a first liquid loading opening, far enough for reaching the filter.

[0035] In another advantageous embodiment, between the first liquid loading opening and the filter there is a separating element, interposed between such a first liquid loading opening and the filter for preventing a user from reaching the filter.

[0036] In a further advantageous embodiment, the liquid loading unit comprises a plurality of liquid loading openings which comprise one or more second liquid loading openings, provided in the lid, via which a liquid can be loaded in the liquid receiving element and go to the outlet opening, passing through the lid, when the latter is in the closed position.

[0037] In an advantageous embodiment, the laundry dryer comprises a box-shaped seat, accessible from the external (preferably from a front side) of the casing, suitable for removably receiving a drawer and comprising, in its bottom region, a housing, fluidly connected to the main liquid reservoir, and in which the liquid loading unit is at least partially housed in a permanent or removable way.

[0038] In an advantageous embodiment, the laundry dryer comprises a sealing element arranged in the housing or in a portion of the liquid loading unit positioned, or that can be positioned, in the housing, so as to be interposed between the housing and the portion for achieving a watertight coupling thereof.

[0039] In an advantageous embodiment, the laundry dryer comprises a moisture condensing device positioned at least partially within the air conduit, downstream of the laundry treating compartment, so as to condense and remove moisture contained in the air flow, the moisture condensing device being fluidly connected to a condensate container receiving condensate removed from the air flow by the moisture condensing device.

[0040] Advantageously, the laundry dryer comprises a pumping system, fluidly connecting the condensate container to the liquid loading unit, comprising a pump that sucks a liquid from the condensate container and pumps it to the liquid loading unit via a piping system having a condensate outlet provided at the liquid loading unit,

and/or to a liquid collecting reservoir of the laundry drier, fluidly connected or connectable to the piping system.

[0041] Advantageously, the laundry dryer which comprises a pumping system, fluidly connecting the condensate container to the liquid loading unit, comprising a pump that sucks a liquid from the condensate container and pumps it to the liquid loading unit via a piping system having a condensate outlet provided at the liquid loading unit, and/or to a liquid collecting reservoir of the laundry drier, fluidly connected or connectable to the piping system, can be made to comprise:

- a casing;
- a laundry treating compartment, mounted within the casing, wherein laundry to be treated can be loaded;
- a drying system comprising an air conduit, passing through and comprising the laundry treating compartment, an air moving device, generating, when operated, an air flow which passes through the air conduit, an air heating device, positioned at least partially within the air conduit so as to heat the air flow before it passes through the laundry treating compartment;
- a steam generator comprising a main liquid reservoir, wherein a liquid can be loaded, and a liquid heating device, operable for generating heat to heat a liquid contained in and/or coming from the main liquid reservoir, so as to produce steam which is delivered to the laundry treating compartment via a steam delivery conduit fluidly connecting the steam generator to the laundry treating compartment;
- a liquid loading unit comprising a liquid receiving element, having an outlet opening, fluidly connected or connectable to the main liquid reservoir.

[0042] Preferably, the condensate outlet is provided at the liquid loading unit upstream of the filter.

[0043] In an advantageous embodiment, the piping system comprises a first valve operable to selectively direct a liquid, sucked by the pump from the condensate container, to the liquid collecting reservoir and/or to the liquid loading unit.

[0044] In another advantageous embodiment, in place of the first valve a piping branch connector is used to split or drive the main liquid flow provided by the pump in a plurality of flows, each having a predetermined flow rate.

[0045] In an advantageous embodiment, the liquid loading unit comprises an overflow opening for discharging outside of the liquid loading unit a liquid contained within the liquid loading unit and exceeding a prefixed level, so as to prevent the liquid from flowing back through the one or more liquid loading openings.

[0046] Preferably, the overflow opening is comprised in the lid and/or in the liquid receiving element, or it is

defined by a gap between the lid and the liquid receiving element.

[0047] Preferably, the overflow opening is fluidly connected to the condensate container in such a way that a liquid flowing out of the overflow opening is drained to the condensate container.

[0048] More preferably, the overflow opening is fluidly connected to the condensate container through an overflow reservoir receiving a liquid flowing out of the overflow opening, and fluidly connected to the condensate container so as to drain to the latter the liquid received from the overflow opening.

[0049] In an advantageous embodiment, the overflow reservoir can be advantageously defined by a portion of bottom region of the box-shaped seat.

[0050] In an advantageous embodiment, the overflow opening is positioned at a prefixed level that prevents the flow back of a liquid from the liquid loading unit to the condensate outlet of the piping system.

[0051] In an advantageous embodiment, the liquid heating device comprises one or more electric heaters housed within the main liquid reservoir for heating a liquid contained therein, and producing steam which is driven towards and released into the inner volume of the laundry treating compartment via the steam delivery conduit.

[0052] In a further advantageous embodiment, the liquid heating device is external to the main liquid reservoir, and it is arranged in such a way to heat the liquid after it exits the main liquid reservoir.

[0053] In this case, preferably, the liquid heating device can comprise a heating conduit, fluidly connecting the main liquid reservoir to the steam delivery conduit, and one or more electric heaters contained in such a heating conduit, which heat a liquid flowing out of the main liquid reservoir and received by the heating conduit, converting such a liquid into steam before it reaches the steam delivery conduit via which it is released into the laundry treating compartment.

[0054] In an advantageous embodiment, the laundry dryer comprises a drain conduit, selectively fluidly connecting the main reservoir to the external of the laundry dryer, so as to allow draining outside the laundry drier a liquid contained in the main reservoir.

[0055] In an advantageous embodiment, the drain conduit is advantageously fluidly connected to the main liquid reservoir by a second valve selectively directing a liquid coming from the main liquid reservoir to the heating conduit and/or to the drain conduit.

[0056] In another advantageous embodiment, in place of the second valve, a piping branch connector is used to split or drive liquid coming from the main liquid reservoir toward the heating conduit and/or to the drain conduit.

[0057] In an advantageous embodiment, the lid is hinged to the liquid receiving element, so as to be moved from the closed to the opened position, and vice-versa, by a rotation, or the lid is slidably connected to the liquid receiving element, so as to be moved from the closed to the opened position, and vice-versa, by sliding on the

liquid receiving element.

[0058] In an advantageous embodiment, the one or more second liquid loading openings have an elongated shape.

[0059] In an advantageous embodiment, the lid is, in a plan view, substantially U-shaped, so as to define two parallel arms, connected by a crosspiece, and arranged for housing therebetween the first liquid loading opening when the lid is in the closed position.

[0060] Preferably, one or more of the second liquid loading openings provided in the lid are arranged on one or both the two parallel arms, and/or on the crosspiece of the lid.

[0061] A further aspect of the invention relates a method for loading a liquid to be converted into steam in a laundry drier according to the invention, which method comprises the step of loading a liquid to be converted into steam in the liquid loading unit of the laundry drier via one or more of the one or more liquid loading openings of the liquid loading unit, while the lid is in the closed position.

[0062] Other advantages and features of a laundry washing machine according to the present invention will be clear from the following detailed description, provided only as a not limitative example, in which:

Figure 1 is a perspective view of a laundry drier according to the invention;

Figure 2 is a perspective view of a laundry drier of figure 1 with the drawer removed;

Figure 3 is an enlarged detail of Figure 2;

Figure 4 is a schematic view of some components of a laundry drier according to the invention;

Figure 5 is a schematic sectional view of some components of laundry drier according to the invention;

Figure 6 is a perspective view of a detail of a liquid loading unit installed in a laundry drier according to the invention;

Figure 7 is a front view of the liquid loading unit of figure 6;

Figure 8 is a cross section operated according to section plane VII-VII of figure 7;

Figure 9 is a perspective view from below of a liquid loading unit of a laundry drier according to the invention, wherein the filter has not been represented;

Figure 10 is a perspective view from above of a liquid loading unit of a laundry drier according to the invention, with the lid in the closed position;

Figure 11 is a perspective view from above of a liquid loading unit of figure 10, with the lid in the closed position;

[0063] In the figures same parts are indicated with the same reference numbers.

[0064] In attached figures, a laundry drier according to the invention is identified by number 1.

[0065] Advantageously, the laundry drier 1 illustrated in attached figures is a tumble drier of the "horizontal axis type"; it is however clear that the invention can be applied, without any substantial modification, also to tumble driers of the vertical axis" type, to washer-driers, both of the "horizontal axis" and of the "vertical axis" type, and also to "drying cabinets".

[0066] The laundry drier 1 (being it a tumble drier, a washer-drier, or a drying cabinet) comprises a casing 2, preferably parallelepiped, configured to be positioned on a horizontal surface 3, for example the floor of a building, preferably by suitable feet 4, one or more of which can have, advantageously, an adjustable height, so as to adapt to a possible not perfect planarity of the horizontal surface 3.

[0067] The laundry drier 1 comprises a laundry treating compartment 5, mounted within the casing 2, wherein laundry to be treated, not illustrated, can be loaded, advantageously via an access opening, also not illustrated, obtained in the casing 2, and selectively closable by a loading/unloading door 6, preferably hinged to the casing 2.

[0068] Advantageously, in case, like in the advantageous example of attached figures, the laundry drier 1 is a tumble drier, the laundry treating compartment 5 is a drum 50, preferably containing one or more lifter 51, rotatably housed within the casing 2, and preferably rotatably supported by rollers 7, which are advantageously pivoted to a supporting structure 8, static with respect to the casing 2.

[0069] If the laundry drier 1 is a washer-drier, not illustrated, the casing 2 also houses a washing tub, not illustrated, preferably suspended within the casing 2 through springs and dumpers, also not illustrated, in which the drum 50 is rotatably contained.

[0070] If the laundry drier 1 is a drying cabinet, not illustrated, the laundry treating compartment 5 is simply a hollow compartment, defined within the cabinet 2, preferably provided with clothes hanger bars or hooks, both not illustrated, for hanging the laundry.

[0071] The laundry drier 1 advantageously comprises a drying system 9, comprising an air conduit 10, passing through and comprising the laundry treating compartment 5, an air moving device 11, for example a fan or blower 110, generating, when operated, an air flow 12 (schematically illustrated in figures 4 and 5 with arrows) which passes through the air conduit 10, an air heating device 13, positioned at least partially within the air conduit 10 so as to heat the air flow 12 before it passes through the laundry treating compartment 5.

[0072] In an advantageous embodiment, for example the one illustrated in attached figures, in which the laundry drier 1 is a tumble drier, and the laundry treating compartment 5 is a drum 50, the air conduit 10 advantageously comprises such a drum 50 (which is preferably arranged to be crossed from its rear side 50a to its front side 50b by the air flow 12), and a plurality of air ducts 52, one or more of which are preferably at least partially comprised in the supporting structure 8 and/or in the loading/unloading door 6, and which are fluidly connected to the drum 50 in such a way to supply the air flow 12 within the drum 50 and to receive the air flow 12 exiting the latter.

[0073] In an advantageous embodiment, like for example in the one illustrated in attached figures, the air conduit 10 is arranged in such a way to circulate the airflow 12 through the laundry treating compartment 5; in this case, moisture laden air flow 12 exiting the laundry treating compartment 5 is deprived of moisture in a moisture condensing device 14, and then it is heated again by the air heating device 13 before being pumped again into the laundry treating compartment 5.

[0074] In this case, preferably, the drying system 9 can also advantageously comprise a lint filter 15, arranged in the air conduit 10, downstream of the laundry treating compartment 5, for trapping lint or fluff released from the laundry and carried out of the laundry treating compartment 5 by the air flow 12.

[0075] In a further advantageous embodiment, not illustrated, the air conduit 10 is arranged in such a way that the air flow 12, after passing through the laundry treating compartment 5, instead of being circulated is discharged to the external environment, optionally after being at least partially deprived of moisture in a moisture condensing device 14.

[0076] Preferably, the moisture condensing device 14 is a heat exchanger arranged for being lapped by the air flow 12 and for causing an heat exchange between such an air flow 12 and a cold fluid (e.g. cold air or a refrigerant) passing through the heat exchanger, so as to cool down the air flow 12 and to condense the moisture contained therein.

[0077] Advantageously, the moisture condensing device 14 is fluidly connected to a condensate container 140 receiving condensate removed from the air flow 12 by the moisture condensing device 14; for example, the condensate container 140 can be a tray 141 positioned below the moisture condensing device 14, so as to collect condensed-moisture drops falling by gravity from the latter.

[0078] In an advantageous embodiment, not illustrated, the air heating device 13 is or comprises one or more electric heaters, not illustrated, positioned at least partially within the air conduit 10 so as to heat the air flow 12 passing on it.

[0079] In a further advantageous embodiment, like the one illustrated in attached figures, the heating device 13 and the moisture condensing device 14 are part of an heat pump system 16, advantageously comprising a

compressor, not illustrated, an expansion valve, also not illustrated, two heat exchangers 17a, 17b (one operating as a condenser, and the other as an evaporator), and conduits, not illustrated, fluidly connecting such elements in a closed circuit; a refrigerant flows through the compressor, the condenser 17a, the expansion valve and the evaporator 17b, and through the conduits connecting these to one another. The refrigerant releases heat to the air flow 12 by means of the condenser 17a, which is therefore the heating device 13, and extracts heat and humidity from the air flow 12 by means of the evaporator 17b, which is therefore the moisture condensing device 14. The compressor converts electromechanical power to thermal power by compressing the refrigerant in the refrigerant circuit.

[0080] The laundry drier 1 comprises also a steam generator 18 comprising a main liquid reservoir 19, wherein a liquid can be loaded, and a liquid heating device 20 operable for generating heat to heat a liquid contained in and/or coming from the main liquid reservoir 19, so as to produce steam which is delivered to the laundry treating compartment 5 via a steam delivery conduit 21 fluidly connecting the steam generator 18 to the laundry treating compartment 5.

[0081] In an advantageous embodiment, not illustrated, the liquid heating device 20 comprises one or more electric heaters, housed within the main liquid reservoir 19 for heating a liquid contained therein, and producing steam which is driven towards and released into the inner volume of the laundry treating compartment 5 via the steam delivery conduit 21.

[0082] In a further advantageous embodiment, like for example the one illustrated in attached figures, the liquid heating device 20 is external to the main liquid reservoir 19, and it is arranged in such a way to heat the liquid after it exits the main liquid reservoir 19.

[0083] For example, like in the advantageous embodiment illustrated in figure 4, the liquid heating device 20 can comprise a heating conduit 200, fluidly connecting the main liquid reservoir 19 to the steam delivery conduit 21, and one or more electric heaters, not illustrated, contained in such a heating conduit 200; the one or more electric heaters heat the liquid flowing out of the main liquid reservoir 19 and received by the heating conduit 200, converting such a liquid into steam, before it reaches the steam delivery conduit 21 via which it is released, in the form of steam, into the laundry treating compartment 5.

[0084] Advantageously, the steam delivery conduit 21 releases the steam into the laundry treating compartment 5 via a nozzle 22.

[0085] According to the invention, the laundry drier 1 comprises a liquid loading unit 23, by which a liquid (e.g. water or water mixed with an additive, for example a fragrance) can be manually loaded into the main liquid reservoir 19; the liquid loading unit 23 comprises a liquid receiving element 24, having an outlet opening 25, fluidly connected or connectable to the main liquid reservoir 19,

and a filter 26, preferably, but not necessarily, removable, provided upstream to or at the outlet opening 25, so as to filter a liquid flowing out of the liquid receiving element 24 via the outlet opening 25.

[0086] Preferably, the liquid receiving element 24 is box shaped and hollow.

[0087] The liquid loading unit 23 comprises a lid 27, movable with respect to the liquid receiving element 24 between a closed position (as the one illustrated for example in figures 2, 3, 4, 6, 7, 8, 9, 10), in which the lid 27 at least partially overlaps the filter 26, preventing a user from reaching the latter, and an opened position (as the one illustrated for example in figure 10) allowing a user to reach the filter 26.

[0088] It is underlined that the expression "reaching" the filter has to be construed as accessing the filter 26 in a way suitable for completely cleaning the latter and/or for grasping the filter in such a way to be able to remove it, if removable, for cleaning or replacing it.

[0089] In the same way, the expression "preventing a user from reaching" the filter 26 has to be construed as avoiding that a user can access the filter 26 in such a way to completely clean the latter, or to grasp such a filter 26 in such a way to be able to remove it, if removable, for cleaning or replacing it.

[0090] In an advantageous embodiment, like the one illustrated in attached figures, the lid 27 is hinged to the liquid receiving element 24, so as to be moved from the closed to the opened position, and vice-versa, by a rotation; preferably, like in the embodiment illustrated in attached figures, the lid 27 is, in a plan view, substantially U-shaped, so as to define two parallel arms 270a, 270b, connected at their first ends by a crosspiece 271 (preferably squared or rectangular in a plan view), and hinged at their second end to the liquid receiving element 24.

[0091] In a further advantageous embodiment, not illustrated, the lid 27 is slidably connected to the liquid receiving element 23, so as to be moved from the closed to the opened position, and vice-versa, by sliding on the liquid receiving element 24.

[0092] According to the invention, the liquid loading unit 23 comprises one or more liquid loading openings allowing to manually load a liquid in the liquid receiving element 24 even when the lid 27 is in the closed position.

[0093] Advantageously, as for example in the advantageous embodiment illustrated in attached figures, the one or more liquid loading openings comprise a first liquid loading opening 28 provided at the liquid receiving element 24 and fluidly connected to the outlet opening 25 via a fluid path 29 bypassing the lid 27 and passing through the filter 26.

[0094] Preferably, the first liquid loading opening 28 is provided in the liquid receiving element 24.

[0095] In an advantageous embodiment, like the one illustrated in attached figures, the liquid receiving element 24 comprises an hopper 30, preferably rectangular or squared in a plan view, in which said outlet opening 25 and said first liquid loading opening 28 are provided.

[0096] Advantageously, the outlet opening 25 and the first liquid loading opening 28 are fluidly connected to one another, preferably via a connecting conduit 290 provided at least partially in the hopper 30; advantageously, the connecting conduit 290 is or is part of the fluid path 29 fluidly connecting the first liquid loading opening 28 to the outlet opening 25.

[0097] In an advantageous embodiment, like the one illustrated in attached figures, the first liquid loading opening 28 is delimited by a perimeter frame 28a, protruding substantially perpendicularly from the hopper 30, and having an opening 280 fluidly connecting the first liquid opening 28 to the connecting conduit 290.

[0098] In an advantageous embodiment, like the one illustrated in attached figures, in which the lid 27 is substantially U-shaped and hinged at the second ends of its parallel arms 270a, 270b to the liquid receiving element 24, the first liquid loading opening 28 is preferably, but not necessarily, arranged in such a way to be positioned between the two parallel arms 270a, 270b of the lid 27 when the latter is in the closed position.

[0099] In a further advantageous embodiment, not illustrated, the first liquid loading opening 28 and the outlet opening 25 are defined by two portions of a same aperture provided in the liquid receiving element 24; preferably, in this advantageous embodiment, the first liquid loading opening 28, the outlet opening 25, and the filter 26 are reciprocally positioned in such a way that, when the lid 27 is in the closed position, it at least partially overlaps the filter 26 and delimits the first loading opening 28 in such a way to prevent a user from reaching the filter 26 via the first loading aperture 28.

[0100] In a further advantageous embodiment, the filter 26 overlaps the outlet opening 25 so that the filter 26 and the outlet opening 25 are aligned with each other, while the first liquid loading opening 25 is misaligned with respect to the filter 26 and the outlet opening 25; this misalignment is such that a user, when the lid 27 is in the closed position, is prevented from reaching, or accessing, the filter 26 in a way suitable for completely cleaning and/or grasping the latter.

[0101] In a further advantageous embodiment, the dimensions of the first liquid loading opening 28 are so small that a user cannot insert a finger within such a first liquid loading opening 28 far enough for reaching the filter, which, when the lid 27 is in the closed position, prevents a user from reaching, or accessing, the filter 26 in a way suitable for completely cleaning and/or grasping the latter.

[0102] In another advantageous embodiment, between the first liquid loading opening 28 and the filter 25 there is a separating element, not illustrated, interposed between such a first liquid loading opening 28 and the filter 26 for preventing a user, when the lid 27 is in the closed position, from reaching, or accessing, the filter 26 in a way suitable for completely cleaning and/or grasping the latter.

[0103] In an advantageous embodiment, in addition

(like in the advantageous embodiment illustrated in attached figures) or as an alternative to the first liquid loading opening 28, the liquid loading unit 23 comprises one or more second liquid loading openings 31, provided in the lid 27, via which a liquid can be loaded in the liquid receiving element 23 and go to the outlet opening 25, passing through the lid 27, when the latter is in said closed position.

[0104] Preferably, the second liquid loading openings 31 have an elongated shape.

[0105] In an advantageous embodiment, like the one illustrated in attached figures, in which the lid 27 is substantially U-shaped and hinged at the second ends of its parallel arms 270a, 270b to the liquid receiving element 24, one or more of the second liquid loading openings 31 are arranged on one or both of the two parallel arms 270a, 270b, and/or on the crosspiece 271 of the lid 27.

[0106] In an advantageous embodiment, like the one illustrated in attached figures, the laundry dryer 1 comprises a box-shaped seat 32, accessible from the external, preferably from a front side 33, of the casing 2, suitable for removably housing a drawer 34.

[0107] In an advantageous embodiment, the box-shaped seat 32 comprises, in its bottom region 320, a housing 35 fluidly connected to the main liquid reservoir 19, in which the liquid loading unit 23 is at least partially housed in a permanent or removable way. Advantageously, the bottom of the housing 35 is funnel shaped, and provided with a first draining opening 35a, fluidly connected to the main liquid reservoir 19.

[0108] Preferably a sealing element 36 is arranged in the housing 35 or in a portion 240 of the loading unit 23 (preferably of the liquid receiving element 24) positioned, or that can be positioned, in the housing 35, so as to be interposed between the housing 36 and the portion 240 for achieving a watertight coupling thereof.

[0109] In an advantageous embodiment, like for example the one illustrated in attached figures, the fluid path 29 fluidly connecting the first liquid loading opening 28 to the outlet opening 25 bypassing the lid 27 and passing through the filter 26, is defined partially in the liquid receiving element 24 and partially by part of the bottom region 320 of the box-shaped seat 32 corresponding to the housing 35 wherein the liquid loading unit 23 is at least partially housed in a permanent or removable way.

[0110] In an advantageous embodiment, like for example the one illustrated in attached figures, the laundry dryer 1 comprises a pumping system 37, fluidly connecting the condensate container 140 to the liquid loading unit 23; the pumping system 37 advantageously comprises a pump 38 that sucks a liquid from the condensate container 140 and pumps it to the liquid loading unit 23 via a piping system 39 having a condensate outlet 40 provided at the liquid loading unit 23, and/or to a liquid collecting reservoir 41 of the laundry drier 1, fluidly connected or connectable to the piping system 39.

[0111] Advantageously, like in the embodiment illustrated in attached figures, the condensate outlet 40 is

provided at the liquid loading unit 23 upstream of the filter 26, so that the liquid coming from the pumping system 37 is filtered before exiting the outlet opening 25 and going to the main liquid reservoir 19.

[0112] Advantageously, the condensate outlet 40 of the piping system 39 enters the liquid loading unit 23 via an opening 40a, preferably obtained in the lid 27, or in the liquid receiving element 23, or partially in the lid 27 and partially in the liquid receiving element 23.

[0113] In an advantageous embodiment, the piping system 39 comprises a first valve 42 operable to selectively direct a liquid, sucked by the pump 38 from the condensate container 140, to the liquid collecting reservoir 41 and/or to the liquid loading unit 23.

[0114] In another advantageous embodiment, in place of the first valve 42, a piping branch connector is used to split or drive liquid sucked by the pump 38 from the condensate container 140, to the liquid collecting reservoir 41 and/or to the liquid loading unit 23.

[0115] Preferably, like in the advantageous embodiment illustrated in attached figures, the liquid collecting reservoir 41 is mounted in the drawer 34, so as to be removably housed in the box-shaped seat 32, which allows to remove end empty such a liquid collecting reservoir 41 when needed.

[0116] In an advantageous embodiment, like for example the one illustrated in attached figures, the liquid loading unit 23 comprises an overflow opening 43 for discharging outside of the liquid loading unit 23 a liquid contained within the liquid loading unit 23, and exceeding a prefixed level, so as to prevent this liquid from flowing back through the one or more liquid loading openings 28, 31.

[0117] Advantageously, such a prefixed level is, with respect to a horizontal surface 3, for example the floor of a building, on which the laundry drier 1 is positioned, lower than the level of the inlet of the one or more liquid loading openings 28, 31.

[0118] Advantageously, the overflow opening 43 is comprised in the lid 27 and/or in the liquid receiving element 24, or it is defined by a gap between the lid 27 and the liquid receiving element 28.

[0119] Advantageously, the overflow opening 43 is fluidly connected to the condensate container 140 in such a way that a liquid flowing out of the overflow opening 43 is drained to the condensate container 140.

[0120] Preferably, the overflow opening 43 is fluidly connected to the condensate container 140 through an overflow reservoir 44, receiving a liquid flowing out of the overflow opening 43, and fluidly connected to the condensate container 140 so as to drain to the latter the liquid received from the overflow opening 43.

[0121] In an advantageous embodiment, like in the one illustrated in attached figures, the overflow reservoir 44 is advantageously defined by a portion 321 of the bottom region 320 of the box-shaped seat 32; preferably, such a portion 321 is funnel shaped, and provided, at its bottom, with a second draining opening 321a, fluidly con-

nected to the condensate container 140.

[0122] In an advantageous embodiment, like the one illustrated in attached figures, the overflow opening 43 is positioned at a prefixed level that prevents the flow back of a liquid from the liquid loading unit 23 to the condensate outlet 40 of the piping system 39.

[0123] Advantageously, such a prefixed level is, with respect to a horizontal surface 3, for example the floor of a building, on which the laundry drier 1 is positioned, lower than the condensate outlet 40 of the piping system 39.

[0124] In an advantageous embodiment, like the one illustrated in attached figures, the laundry drier 1 comprises a drain conduit 45, selectively fluidly connecting the main reservoir 19 to the external of the laundry drier 1, so as to allow selectively draining outside the laundry drier 1 a liquid contained in the main reservoir 19.

[0125] In an advantageous embodiment, like the one illustrated in attached figures, in which the liquid heating device 20 is external to the main liquid reservoir 19 and comprises a heating conduit 200, fluidly connecting the main liquid reservoir 19 to the steam delivery conduit 21, and one or more electric heaters, not illustrated, contained in such a heating conduit 200, the drain conduit 45 can be advantageously fluidly connected to the main liquid reservoir 19, preferably, by a second valve 46, selectively directing a liquid coming from the main liquid reservoir 19 to the heating conduit 200 and/or to the drain conduit 46.

[0126] In another advantageous embodiment, in place of the second valve 46, a piping branch connector is used to split or drive liquid coming from the main liquid reservoir 19 toward the heating conduit 200 and/or to the drain conduit 46.

[0127] The functioning of the laundry drier 1 according to the invention is described the following.

[0128] In order to manually load a liquid, for example water or water mixed with an additive, in the main liquid reservoir 19 of the steam generator 18, a user has simply to pour such a liquid in one or more of the one or more liquid loading openings 28, 31 of the liquid loading unit 23, without the need of opening the lid 27.

[0129] The lid 27 has to be opened only in order to reach the filter 26, for example for cleaning it or removing it, if removable, for its maintenance or replacement.

[0130] In the advantageous embodiment in which both the first and the second liquid loading openings are provided, if the user, while trying to pour the liquid, for example, only in the first liquid loading opening 28, spills some liquid over the lid 27, the second loading opening 31 allow the spilled liquid to enter the liquid receiving element 24 and to go to the main liquid reservoir 19 through the outlet opening 25, so that such a spilled liquid is not wasted.

[0131] During the drying process, if the laundry drier 1 is provided with the moisture condensing device 14, the latter removes moisture from the air flow 12 exiting the laundry treating compartment 5; such a moisture is col-

lected in the condensate container 140, from which it is taken, by the pumping system 37, to the liquid loading unit 23, and optionally to the liquid collecting reservoir 41. From the liquid loading unit 23, the moisture is taken to the main liquid reservoir 19, where it can be used for producing steam.

[0132] The filter 26 of the liquid loading unit 23 grants that the liquid provided to the main liquid reservoir 19 is free from dirt, and in particular from lint or fluff that can be present in the air flow 12 and released in the condensed moisture that is collected in the condensate container 140.

[0133] In the advantageous embodiment in which the liquid loading unit 23 is housed in the housing 35, it is necessary to remove the drawer 34 from the box-shaped seat 32 before being able to load a liquid in the liquid loading unit 23. Differently from the cited prior art, since the loading of liquid in the liquid loading unit 23 can be done with the lid 27 in the closed position, the risk that the drawer 34 is inserted in the box-shaped seat 32 with the lid 27 in the open position, and therefore the risk of damaging the lid 27 and/or the drawer, is very low.

[0134] It is seen therefore how the invention achieves the proposed aim and objects, since, thanks to the possibility to load a liquid in the liquid loading unit without opening the lid, the liquid loading process is easy and quick.

[0135] Moreover, the advantageous embodiment in which both the first and the second liquid loading openings are provided, allows reducing the liquid wastage, since liquid spilled over the lid while being manually poured in the first liquid loading opening can enter the liquid loading element, and go to the outlet opening, via the second loading opening.

[0136] In addition, in the advantageous embodiment in which the liquid loading unit is housed in a housing obtained in the box-shaped seat wherein a drawer can be removably received, the possibility of loading the liquid without opening the lid allows reducing the risk of introducing the drawer in the box-shaped seat with the lid in the open position, and therefore the risk of damaging the lid and/or the drawer.

[0137] Moreover, the advantageously embodiment in which the laundry drier is provided with the moisture condensing device, and the condensed moisture is taken to the liquid loading unit by the pumping system, from which it is taken to the main liquid reservoir passing through the filter, allows reducing the liquid consumption for producing steam, and ensures at the same time that the liquid provided to the main liquid reservoir is free from dirt, and in particular from lint and fluff, that could damage the steam generator.

NUMBERS:

[0138]

1 laundry drier

2	casing
3	horizontal surface
4	feet
5	laundry treating compartment
5 6	loading/unloading door
7	rollers
8	supporting structure
9	drying system
10	air conduit
10 11	air moving device
12	air flow
13	air heating device
14	moisture condensing device
15	lint filter
15 16	heat pump system
17a, 17b	heat exchanger (condenser, evaporator)
18	steam generator
19	main liquid reservoir
20	liquid heating device
20 21	steam delivery conduit
22	nozzle
23	liquid loading unit
24	liquid receiving element
25	outlet opening
25 26	filter
27	lid
28	first liquid loading opening
28a	perimeter frame
29	fluid path
30	hopper
30 31	second liquid loading opening
32	box-shaped seat
33	front side
34	drawer
35	housing
35a	first draining opening
36	sealing element
37	pumping system
38	pump
40	pipng system
40	condensate outlet
40a	opening
41	liquid collecting reservoir
42	first valve
45	overflow opening
44	overflow reservoir
45	drain conduit
46	second valve
50	drum
50 50a	rear side
50b	front side
51	lifters
52	air ducts
110	fan or blower
55 140	condensate container
141	tray
200	heating conduit
240	portion

270a, 270b arms
 271 crosspiece
 290 connecting conduit
 320 bottom region
 321 portion
 321a second draining opening

Claims

1. A laundry dryer (1) comprising:

- a casing (2);
- a laundry treating compartment (5), mounted within said casing (2), wherein laundry to be treated can be loaded;
- a drying system (9) comprising an air conduit (10), passing through and comprising said laundry treating compartment (5), an air moving device (11), generating, when operated, an air flow (12) which passes through said air conduit (10), an air heating device (13), positioned at least partially within said air conduit (10) so as to heat said air flow (12) before it passes through said laundry treating compartment (5);
- a steam generator (18) comprising a main liquid reservoir (19), wherein a liquid can be loaded, and a liquid heating device (20) operable for generating heat to heat a liquid contained in and/or coming from said main liquid reservoir (19), so as to produce steam that is delivered to said laundry treating compartment (5) via a steam delivery conduit (21) fluidly connecting said steam generator (6) to said laundry treating compartment (5);
- a liquid loading unit (23) comprising a liquid receiving element (24), having an outlet opening (25), fluidly connected or connectable to said main liquid reservoir (19), and a filter (26), provided upstream to or at said outlet opening (25), so as to filter a liquid flowing out of said liquid receiving element (24) via said outlet opening (25),

wherein said liquid loading unit (23) comprises a lid (27), movable with respect to said liquid receiving element (24) between a closed position, in which said lid (27) at least partially overlaps said filter (26), preventing a user from reaching the latter, and an opened position allowing a user to reach said filter (26),

characterized in that

said liquid loading unit (23) comprises one or more liquid loading openings (28, 31) allowing to manually load a liquid in said liquid receiving element (24) even when said lid (27) is in said closed position.

2. A laundry dryer (1), as in claim 1, wherein said one

or more liquid loading openings (28, 31) comprise a first liquid loading opening (28) provided at said liquid receiving element (24) and fluidly connected to said outlet opening (25) via a fluid path (29) bypassing said lid (27) and passing through said filter (26).

3. A laundry dryer (1), as in claim 2, wherein said first liquid loading opening (28) is provided in said liquid receiving element (24).

4. A laundry dryer (1), as in claim 2 or 3, wherein said liquid receiving element (24) comprises an hopper (30), in which said outlet opening (25) and said first liquid loading opening (28) are provided, wherein said outlet opening (25) and said first liquid loading opening (28) are fluidly connected to one another.

5. A laundry dryer (1), as in one or more of the previous claims, wherein said liquid loading unit (23) comprise a plurality of liquid loading openings (28, 31) which comprise one or more second liquid loading openings (31), provided in said lid (27), via which a liquid can be loaded in said liquid receiving element (24) and go to said outlet opening (25), passing through said lid (27), when the latter is in said closed position.

6. A laundry dryer (1), as in one or more of the previous claims, wherein said laundry dryer (1) comprises a box-shaped seat (32), accessible from the external of said casing (2) and suitable for removably receiving a drawer (320), comprising, in its bottom region (320), a housing (35), fluidly connected to said main liquid reservoir (19), and in which said liquid loading unit (23) is at least partially housed in a permanent or removable way.

7. A laundry dryer (1), as in claim 6, comprising a sealing element (36) arranged in said housing (35) or in a portion (240) of said liquid loading unit (23) positioned, or that can be positioned, in said housing (35), so as to be interposed between said housing (35) and said portion (240) for achieving a watertight coupling thereof.

8. A laundry dryer (1), as in one or more of the previous claims, comprising a moisture condensing device (14) positioned at least partially within said air conduit (10), downstream of said laundry treating compartment (5), so as to condense and remove moisture contained in said air flow (12), said moisture condensing device (14) being fluidly connected to a condensate container (16) receiving condensate removed from said air flow (12) by said moisture condensing device (14).

9. A laundry dryer (1), as in claim 8 comprising a pumping system (37), fluidly connecting said condensate container (140) to said liquid loading unit (23), com-

prising a pump (38) that sucks a liquid from said condensate container (140) and pumps it to said liquid loading unit (23) via a piping system (39) having a condensate outlet (40) provided at said liquid loading unit (23), and/or to a liquid collecting reservoir (41) of said laundry drier (1), fluidly connected or connectable to said piping system (39). 5

10. A laundry dryer (1), as in claim 9, wherein said condensate outlet (40) is provided at said liquid loading unit (23) upstream of said filter (26). 10

11. A laundry dryer (1), as in one or more of the previous claims, wherein said liquid loading unit (23) comprises an overflow opening (43) for discharging outside of said liquid loading unit (23) a liquid contained within said liquid loading unit (23) and exceeding a pre-fixed level, so as to prevent said liquid from flowing back through said one or more liquid loading openings (28, 31). 15 20

12. A laundry dryer (1), as in claim 11, wherein said overflow opening (43) is comprised in said lid (27) and/or in said liquid receiving element (24), or it is defined by a gap between said lid (27) and said liquid receiving element (24). 25

13. A laundry dryer (1), as in claim 11 or 12, when depending on claim 8 or on a claim depending on claim 8, wherein said overflow opening (43) is fluidly connected to said condensate container (140) in such a way that a liquid flowing out of said overflow opening (43) is drained to said condensate container (140). 30

14. Laundry drier (1) as in one or more of the previous claims, wherein said lid (27) is hinged to said liquid receiving element (24), so as to be moved from said closed to said opened position, and vice-versa, by a rotation, or said lid (27) is slidably connected to said liquid receiving element (24), so as to be moved from said closed to said opened position, and vice-versa, by sliding on said liquid receiving element (24). 35 40

15. Method for loading a liquid to be converted into steam in a laundry drier (1) according to one or more of the previous claims, comprising the step of loading a liquid to be converted into steam in said liquid loading unit (23) of said laundry drier (1) via one or more of said one or more liquid loading openings (28, 31) of said liquid loading unit (23), while said lid (27) is in said closed position. 45 50

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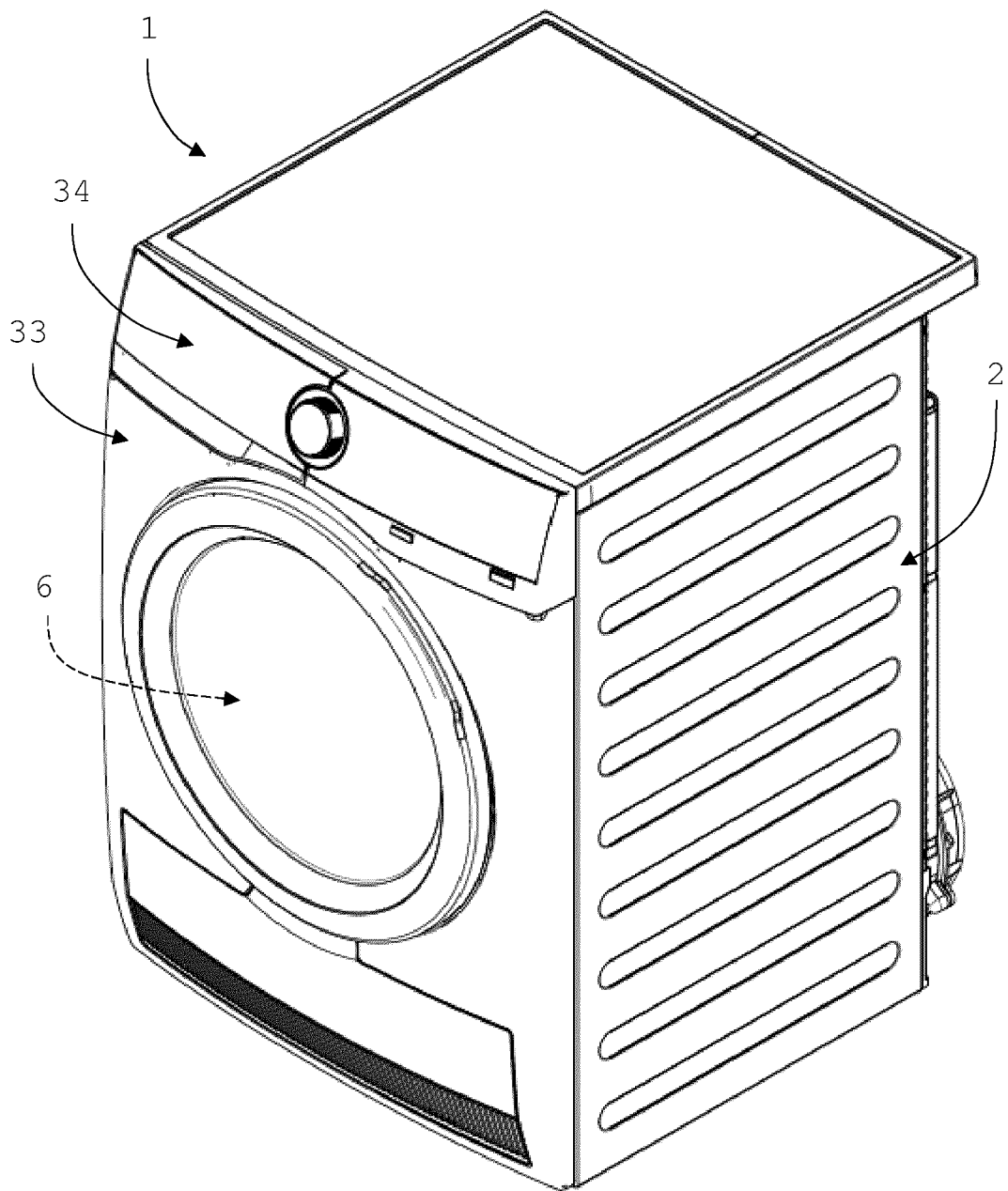


Fig. 1

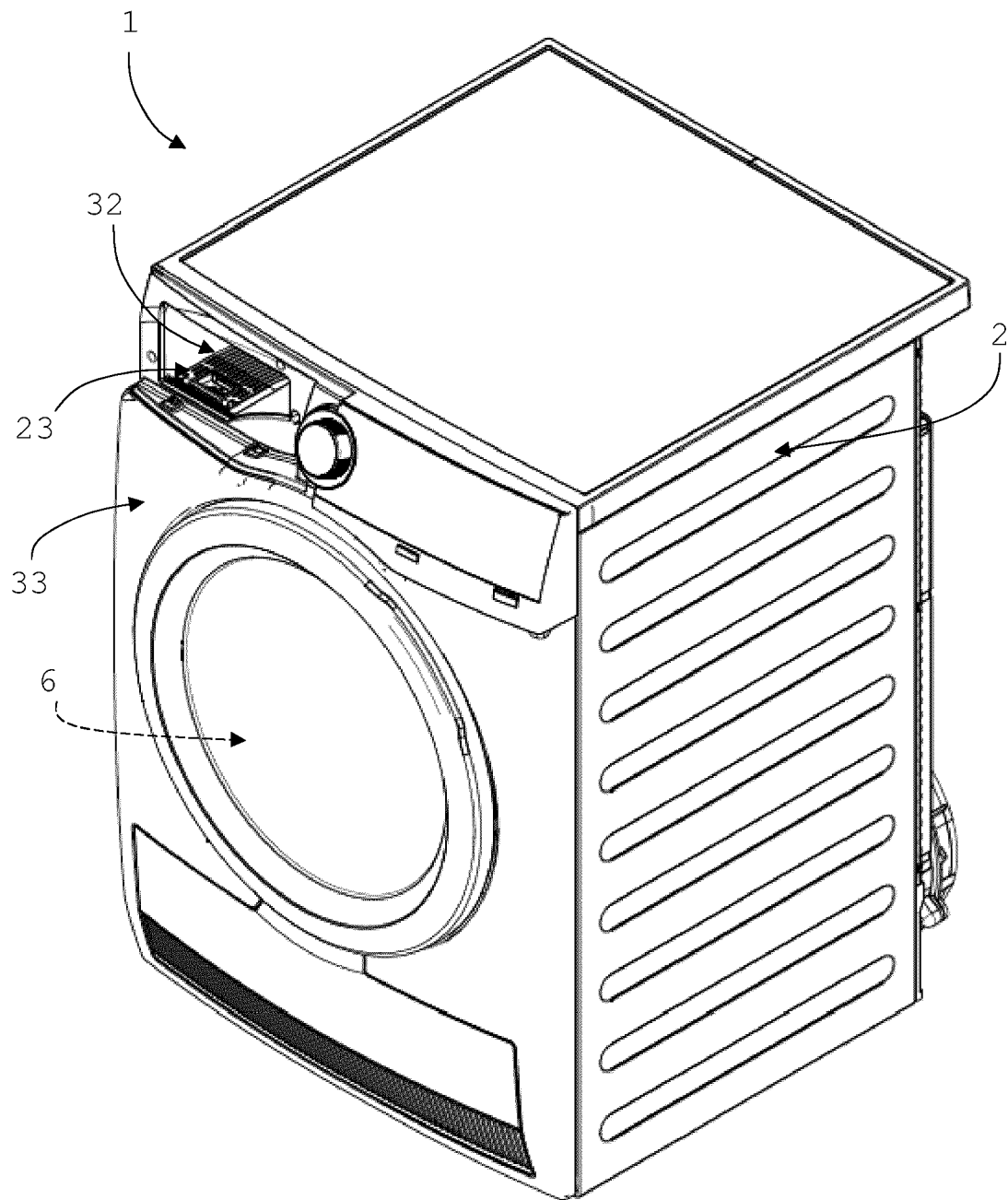


Fig. 2

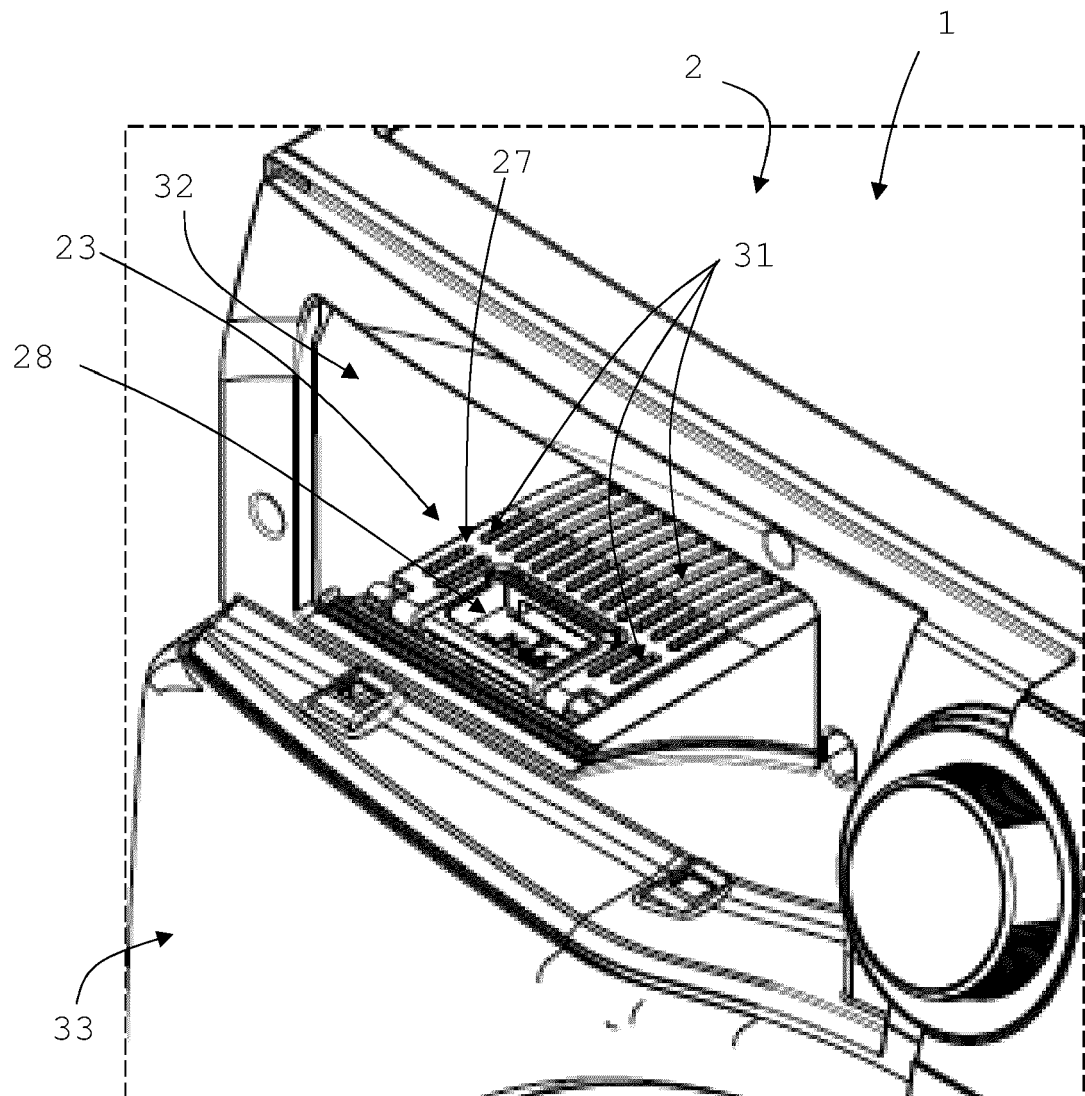


Fig. 3

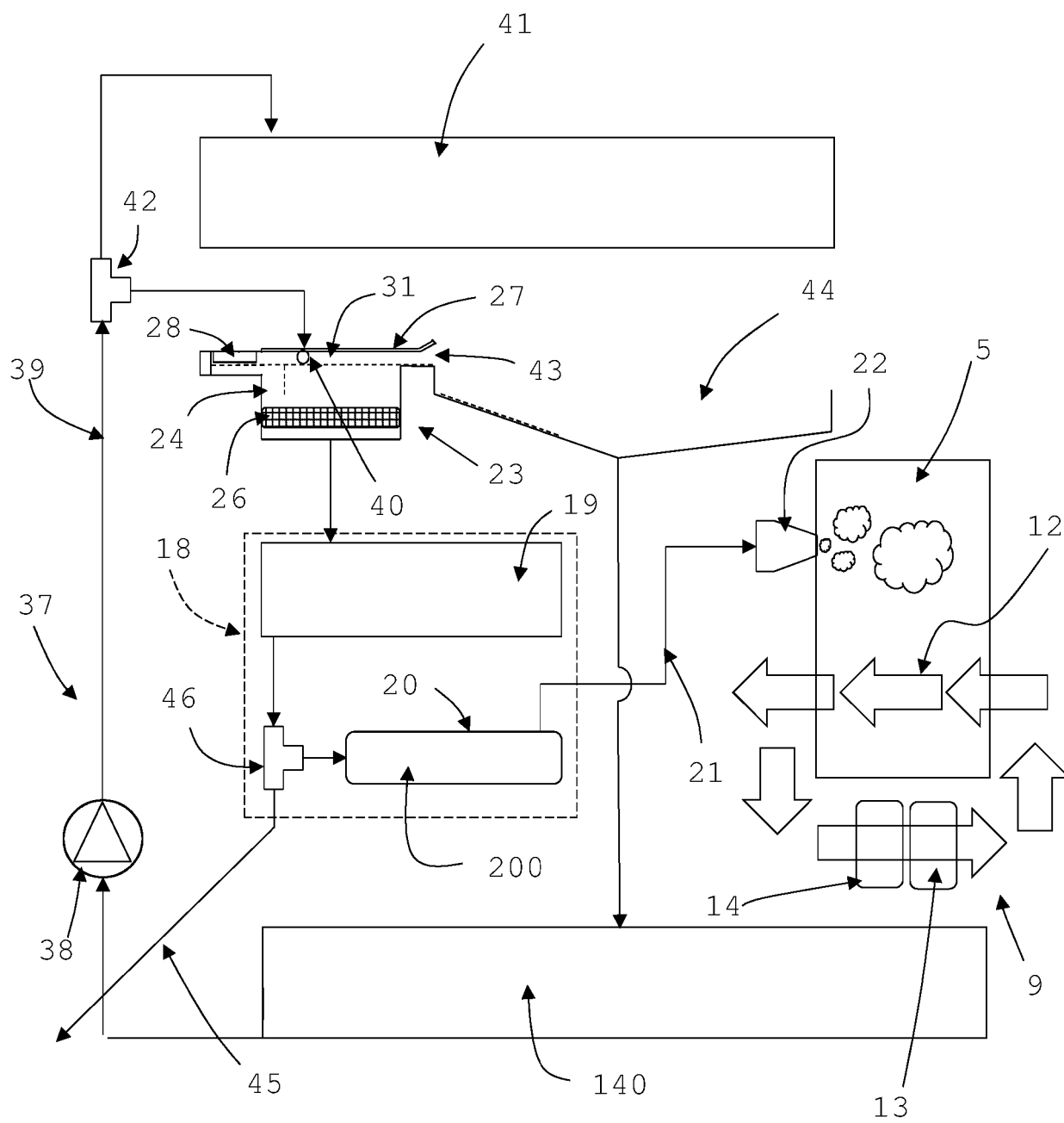


Fig. 4

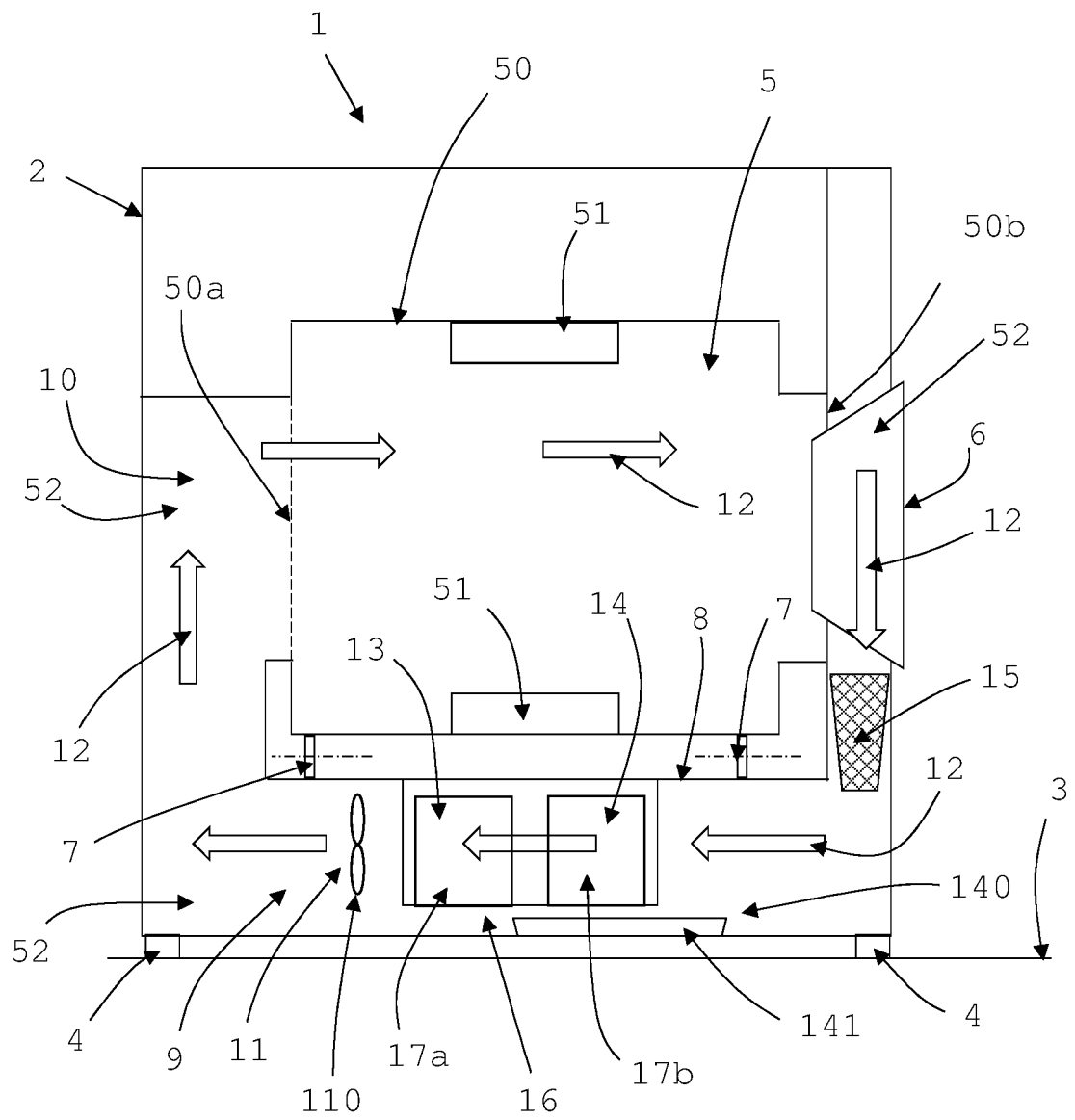
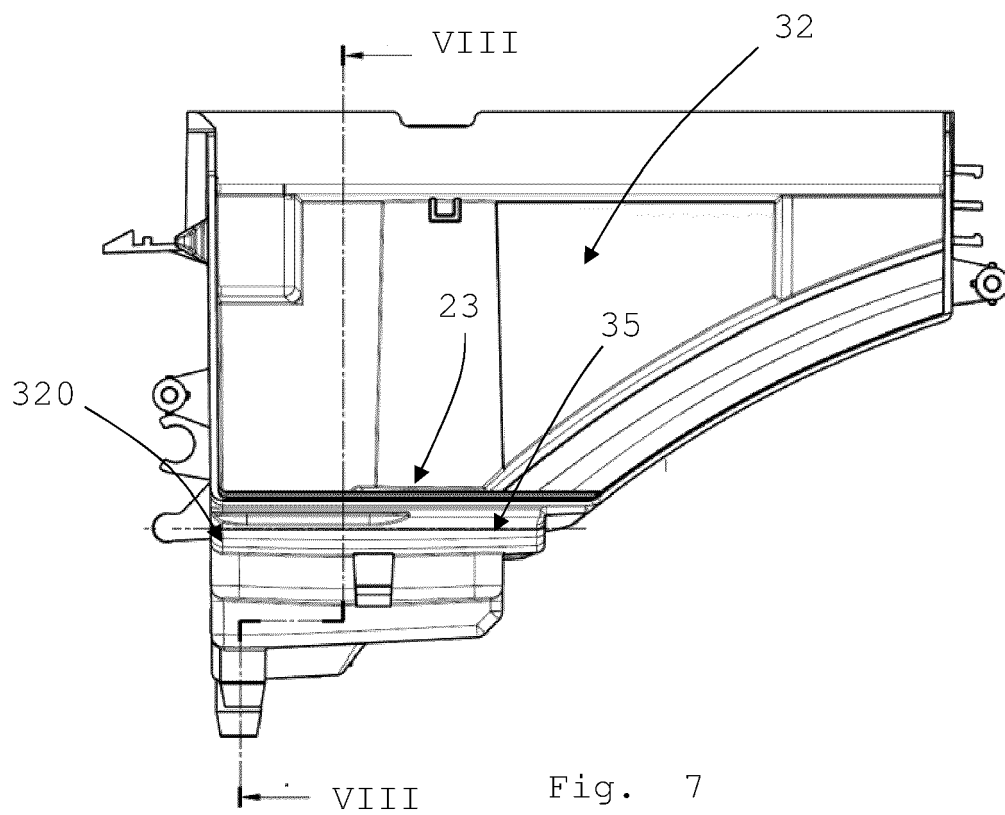
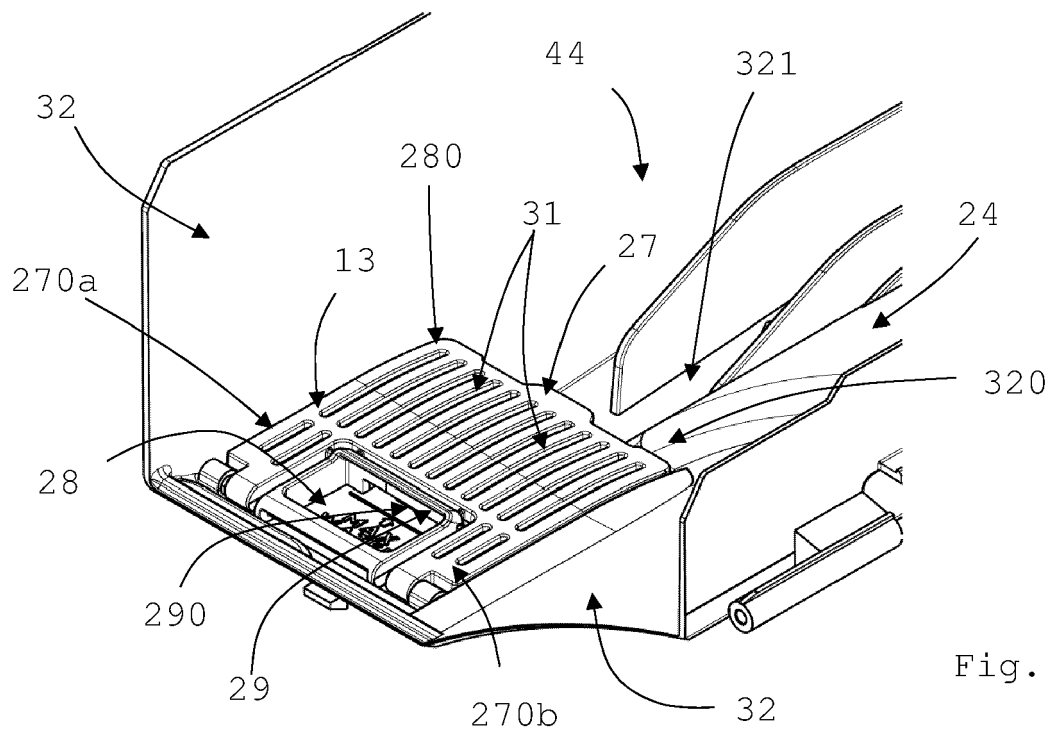
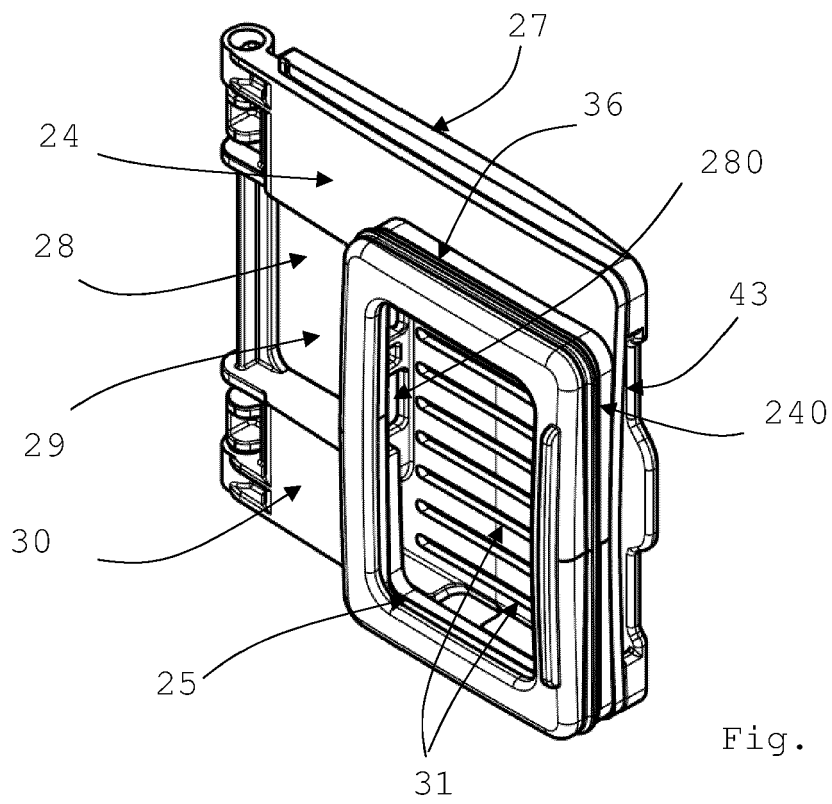
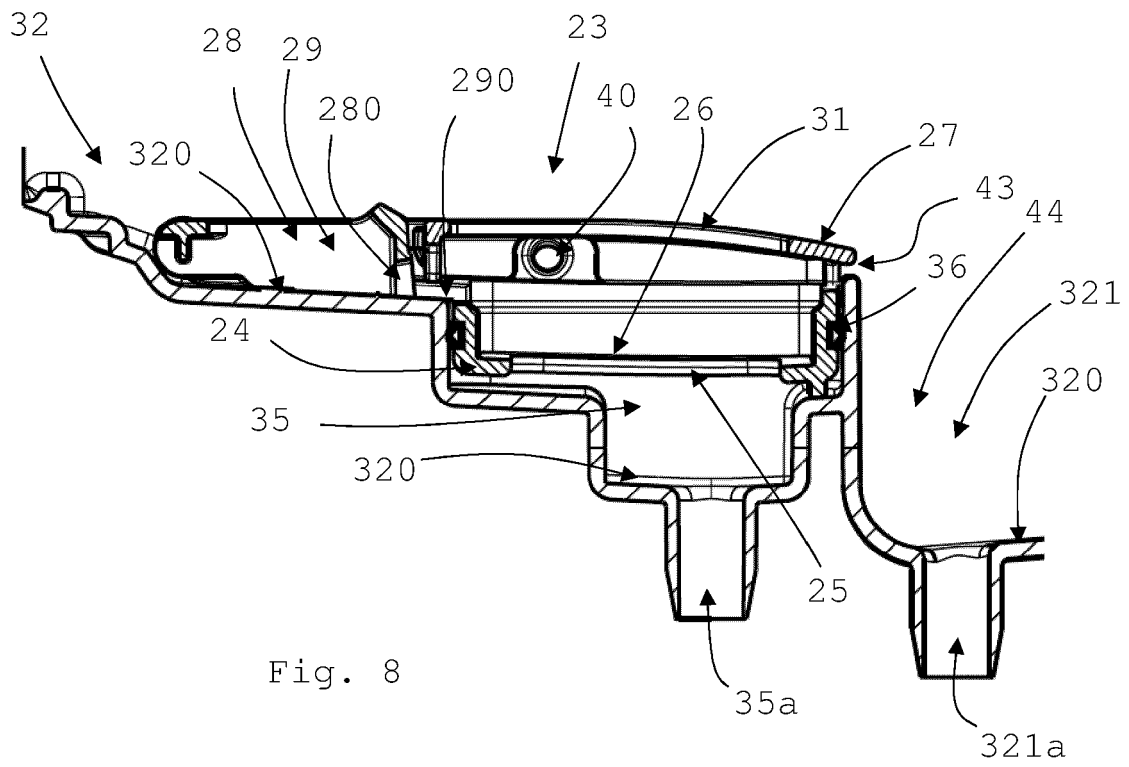
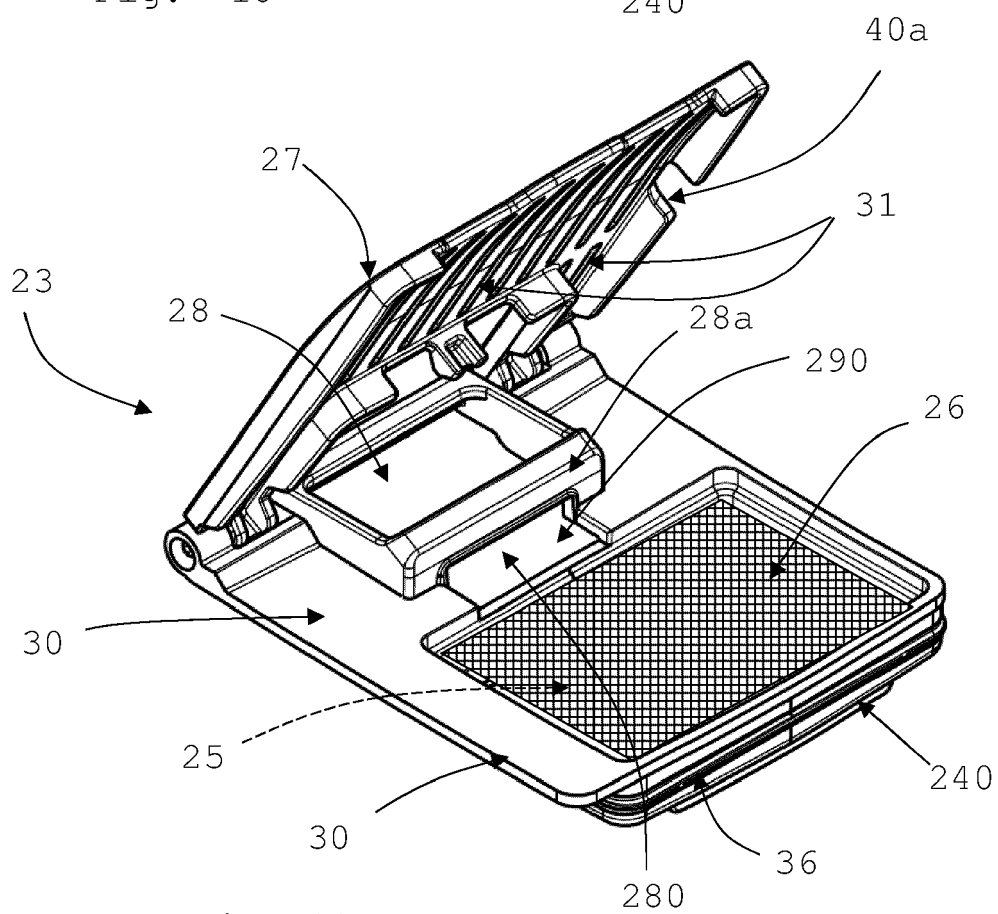
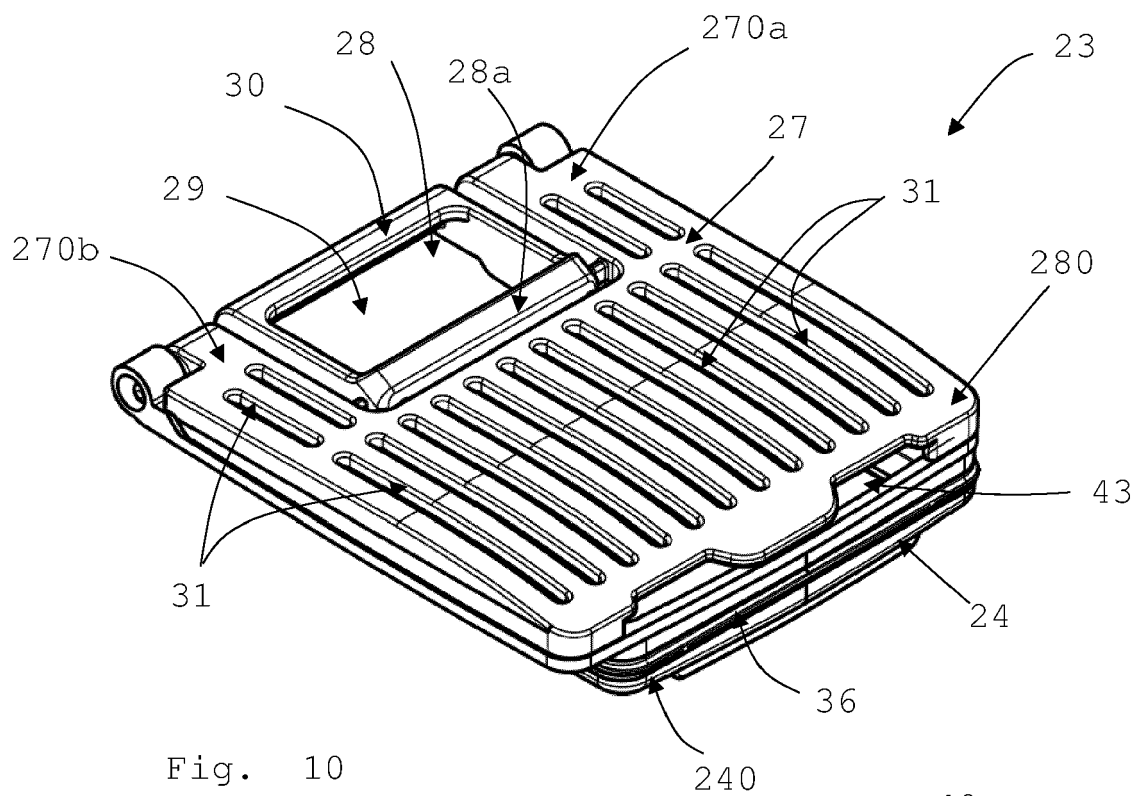


Fig. 5









EUROPEAN SEARCH REPORT

Application Number
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EPO FORM 1503 03.82 (P04C01)

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Y	* figures 1-6 * * paragraph [0020] * * paragraph [0054] *	8, 9	ADD. D06F58/24
A	----- EP 3 224 401 B1 (ARCELIK AS [TR]) 5 September 2018 (2018-09-05) * figures 4-5 *	1-7, 10-15	
Y	----- US 2014/238086 A1 (CHOI JUNGHOI [KR] ET AL) 28 August 2014 (2014-08-28) * figures 5-6 * * paragraph [0113] * * paragraph [0131] *	8, 9	

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			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 September 2021	Examiner Werner, Christopher
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			



Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 21 15 1487

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-7, 11-15

Invention 1 (claims 1, 15, 2-7 with 1 and 11-14 with 1) relates to a laundry dryer with a liquid loading unit to provide liquid to a steam generator.

1.1. claim: 14

Sub-invention 1.1 (claim 14 with 1) relates to a laundry dryer with a particularly attached lid.

2. claims: 8-10

Invention 2 (claims 8-10 with 1) relates to a laundry dryer with a condensing unit collecting condensed water and using it for steam generation.

Please note that all inventions mentioned under item 1, although not necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

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

EP 21 15 1487

5

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
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