(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 743 396 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.06.2014 Bulletin 2014/25

(51) Int Cl.:
D06F 58/20 *(2006.01)* ***D06F 58/24*** *(2006.01)*

(21) Application number: **12197435.6**

(22) Date of filing: **17.12.2012**

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

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

(72) Inventors:
- **Pillot, Sergio**
  I-33080 Porcia (PN) (IT)
- **Santarossa, Marco**
  I-33080 Porcia (PN) (IT)
- **Lorenc, Marcin**
  I-33080 Porcia (PN) (IT)

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

(54) Laundry drying machine

(57) The present invention relates to laundry machines, such as laundry drying machines and laundry washing/drying machines. A laundry drying machine (100) according to the invention has a drying air circuit comprising a moisture condensing element for condensing moisture from said drying air, an air inlet (325) and/or an air outlet (320) for allowing a cooling air flow to flow into and/or out of the laundry drying machine (100) to cool the moisture condensing element, a collection tank (105) for collecting moisture condensed in the condensing element, a tank housing (110) for accommodating the collection tank (105), said tank housing (110) being adjacent to at least one between said air inlet (325) and/or said air outlet (320) and having at least one sidewall (330a, 330b) separating the tank housing (105) from the adjacent air inlet (325) and/or air outlet (320), and a cover element (160) adapted to hide the collection tank (105) when said collection tank is accommodated in the tank housing (110). A laundry drying machine (100) according to the invention is characterized in that the cover element (160) is provided with one or more pass-through apertures (170) allowing said cooling air to flow through the cover element (160), and said at least one sidewall (330a, 330b) is permeable to the cooling air.

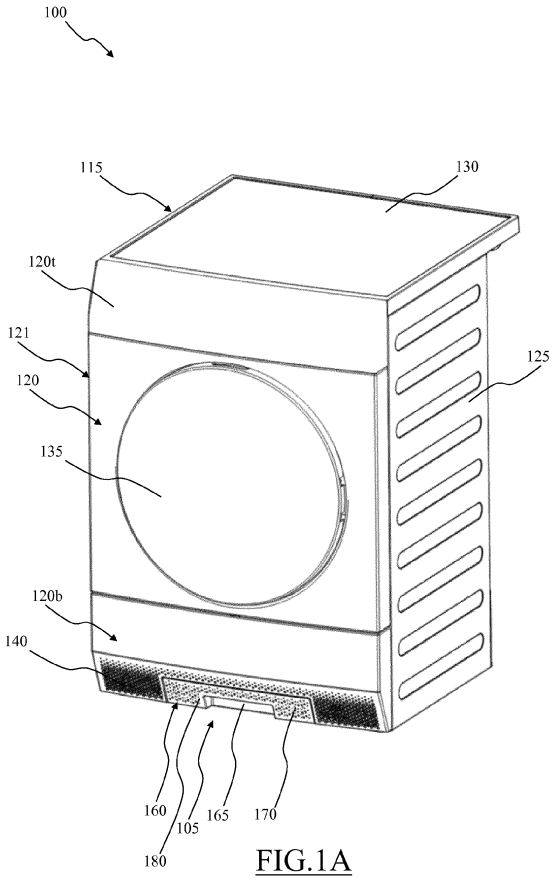

FIG.1A

EP 2 743 396 A1

Description

[0001] The present invention relates to laundry machines, such as laundry drying machines and laundry washing/drying machines, both for domestic and professional use. More particularly, the present invention relates to cover elements for such machines.

[0002] Generally, laundry drying machines may be divided in two categories according to the air circuit type implemented therein with the purpose of managing a flow of drying air (process air). Laundry machines of a first category are denoted as vented dryers. In operation, vented dryers draw air from the outside into the laundry machine, heat it, then blow the heated air through the laundry to be dried and finally exhaust back outside such air - together with moisture absorbed from the laundry. Laundry drying machines of the second category are denoted as condensation dryers. Condensation dryers are provided with a closed drying air circuit (process air circuit) comprising a moisture condensing unit - or simply, condensing unit - adapted to condense moisture dispersed in process air; therefore, there is no exhaustion of moisturized air from the laundry machines during operation.

[0003] Condensation dryers may be further subdivided in two subtypes, according to the device used for condensing moisture from process air. The condensation dryers of the first subtype are provided with an air-air heat exchanger, which cools and demoisturizes the process air by using ambient air as a coolant. Conversely, the condensation dryers of the second subtype are provided with a heat pump system, which has an evaporator portion for cooling and de-moisturizing the process air.

[0004] Condensation dryers of both subtypes usually comprise a collection tank for collecting water condensed from the moisturized process air exiting the drying chamber. Advantageously, in a condensation dryer having an air-air heat exchanger as moisture condensing unit, the tank may be provided in a lower portion of the laundry machine at least in part below the condensing unit; in this way, the condensed moisture will fall down from the condensing unit into the tank - passing through a suitable duct -, by the force of gravity. Thus, there is no need for a pump assembly for pumping the condensed moisture from the condensing unit area to the collection tank as in the case in which the collection tank is positioned in an upper portion of the laundry drying machine, above the condensing unit.

[0005] The placement of the collection tank in the bottom part of the laundry drying machine is made, typically, at a front panel thereof so as to allow an easy extraction of the collection tank by a user. In the front panel of the machine there are also provided the air inlet and/or air outlet section of a condensing cooling circuit that draws ambient air from the machine surroundings and discharges such air after it has been used to cool the condensing unit. Accordingly, the provision of the collection tank in the bottom of the laundry machine reduces the space available for the air inlet and/or the air outlet section and for ensuring an adequate flow rate to such sections of the cooling circuit. The reduction in the cooling air flow rate may lead to a reduction of the overall performance of the condensing unit, since the cooling operation may get slower and, consequently, the drying operation time of the laundry drying machine longer compared to an arrangement wherein the collection tank is positioned in an upper portion of the laundry drying machine and the air inlet and/or air outlet section of a condensing unit cooling circuit are arranged in the bottom part of the laundry drying machine.

[0006] There is therefore the need to ensure that a laundry drying machine having a condensate collection tank and air inlet and/or outlet section located at the bottom part of the machine casing has at least the same condenser cooling performance as that one of a laundry dryer wherein the condensate collection tank is placed at an upper part of the machine casing.

[0007] It is a further scope of the invention to provide a laundry drying machine having an efficient exchange of air from/to the ambient surrounding the machine.

[0008] The Applicant has faced the problem of devising a satisfactory solution able to overcome the above-discussed problems.

[0009] One aspect of the present invention proposes a laundry drying machine for treating laundry items comprising a drying air circuit comprising a moisture condensing element for condensing moisture from said drying air, an air inlet and/or an air outlet for allowing a cooling air flow to flow into and/or out of the laundry drying machine to cool the moisture condensing element, a collection tank for collecting moisture condensed in the condensing element, a tank housing for accommodating the collection tank, said tank housing being adjacent to at least one between said air inlet and/or said air outlet and having at least one sidewall separating the tank housing from the adjacent air inlet and/or air outlet, and a cover element adapted to hide the collection tank when said collection tank is accommodated in the tank housing; in said laundry drying machine the cover element is provided with one or more pass-through apertures allowing said cooling air to flow through the cover element, and said at least one sidewall is permeable to the cooling air.

[0010] Preferred features of the present invention are set in the dependent claims.

[0011] In an embodiment of the invention at least one air channel is formed between said cover element and said collection tank.

[0012] In one aspect of the invention, said at least one air channel is in fluid communication with the air inlet or the air outlet, the air channel being delimited by a wall which is impermeable to the cooling air.

[0013] In a further aspect of the invention the laundry drying machine comprises a casing adapted to enclose any component part of the laundry drying machine, said casing having a front side with a door providing access to a laundry drying chamber, wherein a bottom portion

of the casing front side is provided with a housing aperture for allowing the collection tank to access the tank housing, the cover element being flush with the bottom portion when the collection tank is accommodated in the tank housing.

[0014] In still another aspect of the invention the bottom portion of the casing front side comprises at least one sidewall separating the tank housing from the adjacent air inlet and/or air outlet.

[0015] In one embodiment of the invention, the casing front side comprises a front panel accommodating a door and the bottom portion of the casing front side is pivotable relative to the front panel.

[0016] Preferably, the cover element comprises a front wall carrying one or more pass-through apertures, and further comprises at least one cover sidewall protruding from the front wall, said at least one cover sidewall being permeable to the cooling air.

[0017] Further preferably, the cover element is attached or attachable to the collection tank by engaging the at least one cover sidewall with a lateral side of the collection tank.

[0018] In another embodiment of the invention the cover element is formed integral with the collection tank.

[0019] In still another embodiment of the invention the cover element is pivotally fixed to the bottom portion of the casing front side so as to cover the housing aperture.

[0020] In one aspect of the invention the cover element comprises a grasping portion adapted to be grasped by a user hand.

[0021] Preferably, the one or more pass-through apertures are provided around the grasping portion.

[0022] Further preferably, the grasping portion is formed on the cover element as a depression or set-back part.

[0023] In another aspect of the invention a first air channel is in fluid communication with the air inlet and a second air channel is in fluid communication with the air outlet, said impermeable-to-air wall fluidly separating the first air channel from the second air channel.

[0024] In an embodiment of the invention, the laundry drying machine comprises an air inlet and an air outlet, the cover element being arranged between the air inlet and the air outlet.

[0025] These, and others, features and advantages of the solution according to the present invention will be better understood by reading the following detailed description of an embodiment thereof, provided merely by way of non-limitative example, to be read in conjunction with the attached drawings, wherein:

Figures 1A and **1B** are perspective views of a laundry drying machine according to an embodiment of the present invention showing a collection tank inserted and extracted, respectively, in/from a tank housing;

Figure 2 is an enlarged front view of a lower portion of the laundry drying machine of **Figures 1A -1B;**

Figure 3A is a cross-sectional view of a portion of the laundry drying machine according to **III-III** axis shown in **Figure 2;** and

Figure 3B is a view similar to that of **Figure 3A** in which inlet and outlet airflows are conceptually illustrated.

[0026] With reference to the drawings, **Figures 1A** and **1B** are perspective views of a laundry machine **100** according to an embodiment of the present invention showing a collection tank **105** inserted and extracted, respectively, in/from a tank housing **110.**

[0027] The laundry machine **100** is a machine for treating laundry; in particular, the laundry machine of the herein considered example is a laundry dryer, but the present invention may as well be applied to laundry treating machines having laundry drying functions, such as laundry washing/drying machines. In the present example, the laundry drying machine **100** is of the front-loading type, anyway, also laundry drying machines of the top-loading type may benefit from the solution according to the present invention. Moreover, the laundry drying machine **100** herein considered is a condensation dryer provided with a condensing unit comprising an air-air heat exchanger (not shown in the figure).

[0028] The laundry drying machine **100** comprises a casing **115** generally parallelepiped shaped that is adapted to enclose substantially any component part of the laundry machine that are needed for carrying out a drying process on laundry. Electronic boards, electro-mechanic and mechanic component parts, an electric motor, a rotatable drum accommodating laundry to be treated, drying air and cooling air channels, a heating device and a drying air moisture removing unit are component parts enclosed by said casing **115.** The casing **115** has a front panel **120,** a rear panel (not visible in the drawings), two side panels **125** (only one of which visible in the figures) and a top panel **130,** which closes a top portion of the laundry machine **100.** A basement portion **305 (Figure 3A)** closes the casing **115** at its bottom portion and forms a support for carrying at least some of the machine component parts for carrying out a drying process on laundry.

[0029] In a front side **121** of the casing **115,** an access opening for accessing the interior of the laundry machine **100** is provided (not visible in the drawings). Particularly, the access opening allows a user accessing a drum (not visible in the drawings) rotatably mounted within the casing **115** and defining a drying chamber, where the laundry to be treated is stored. The access opening is selectively closable by a door **135** provided on the front side **121** of the casing **115.** Such door **135** is adapted to seal the above mentioned drying chamber in an airtight manner.

[0030] Furthermore, the front side **121** of the casing **115** comprises a front top portion **120t,** a front panel **120** and a front bottom portion **120b.** In the front top portion **120t,** a user interface (not shown in the figures) is preferably arranged, which allows the user to set operating parameters, *e.g.* selecting the drying process to be per-

formed on laundry, and/or operating cycle options *e.g.*, extra-dry cycle. Conversely, the front bottom portion **120b** comprises a permeable-to-air part **140.** The permeable-to-air part **140** is preferably a lowest strip-like part or band of the front bottom portion **120b,** which is provided with a plurality of pass-through apertures. The plurality of pass-through apertures in the permeable-to-air part **140** allows ambient air flowing into and/or out from the laundry machine **100,** for example, for being used to cool a drying air moisture condensing unit, placed inside the machine. Indeed, behind the permeable-to-air part **140** an air inlet and/or and an air outlet are provided as it will be better described below.

[0031] The air inlet and/or outlet are part of an air circuit provided in the laundry machine **100** for drawing ambient air from the surroundings of the laundry machine **100,** using such ambient air an air-air heat exchanger of a condensing unit so as to cool the laundry drying air (process air) and condense moisture absorbed from the laundry stored in the drying chamber. Afterwards, the condensing unit cooling air is exhausted through the air outlet.

[0032] Moreover, as shown in **Figure 1B,** in the permeable-to-air part **140,** preferably in the middle portion thereof, a housing aperture **145** is provided. The housing aperture **145** provides access to a tank housing **110** which slidingly receives a moisture collection tank **105.**

[0033] The collection tank **105** is provided for collecting moisture removed from laundry by the condensing unit and preferably has substantially a parallelepiped shaped and is further preferably made of a polymer of suitable density (*e.g*, HDPE), even though other materials may be used. Advantageously, the collection tank is provided with ribs **150** on its upper and/or lower surfaces (the latter being not visible in the drawings). The ribs **150** grants an improved robustness to the collection tank **105** so as to prevent deformation thereof due to weight of water *i.e*. moisture condensed from the process air during a laundry drying cycle. The collection tank **105** also comprises an opening **155** adapted to couple with a moisture duct (not shown in the figures) when the collection tank **105** is inserted in the tank housing **110.** Said moisture duct is in fluid communication with the condensing unit so as to convey condensed moisture to the collection tank **105** during the operation of the laundry machine **100.**

[0034] As it can be appreciated by considering also **Figure 2,** which is an enlarged front view of the front bottom portion **120b** of the laundry machine **100,** the collection tank **105** is provided with a cover element **160,** which may be attached or attachable to the collection tank **105** or, alternatively, formed integral with the tank **105.** The cover element **160** is preferably designed to be flush with the permeable-to-air part **140** when the collection tank **105** is completely inserted in the tank housing **110.** Moreover, the cover element **160** preferably comprises a handle or a grasping portion **165** that may be grasped by a user hand for facilitating the insertion/extraction operation of the collection tank **105** in/from the tank housing **110.** The grasping portion **165** is preferably formed as a depression or set-back part on the cover element **160.**

[0035] The cover element **160** hides the collection tank **105** and, at the same time, gives continuity to the design of the front bottom portion **120b** of the casing front side **121.**

[0036] In an embodiment of the present invention, the cover element **160** comprises a front wall **180** advantageously provided with a plurality of pass-through apertures **170,** which are preferably arranged around the grasping portion **165** and, together with apertures formed on the permeable-to-air part **140,** preferably form a continuous distribution of apertures over the casing front side **121** bottom portion **120b.** Such plurality of apertures **170** makes the cover element **160** permeable to fluids (*e.g*, air) and allows increasing an airflow rate to and/or from the inner part of the machine casing **115,** e.g. a moisture condensing unit provided within the laundry machine **100** as it will be described in greater detail below. In the example at issue, the grasping portion **165** is not provided with pass-through apertures, but nothing prevents from providing also the grasping portion **165** with pass-through holes.

[0037] In another embodiment of the present invention the cover element **160** may be pivotally fixed to the bottom portion **120b** of the casing front side **121,** so as to cover the housing aperture **145,** instead of being attached to the collection tank **105.** In this case, the user, in order to insert/extract the collection tank **105** in/from the tank housing **110,** has to pivot the cover element **140** until it reaches an open position. The grasping portion **165** helps the user in performing such operation.

[0038] Turning now to **Figure 3A,** a cross-sectional view of a front-lower portion of the laundry machine **100** according to **III-III** axis of **Figure 2** is shown.

[0039] In the example at issue, the laundry drying machine **100** further comprises a basement portion **305,** which forms a support for carrying at least some of the machine component parts for carrying out a drying process on laundry. The bottom portion **120b** of the casing front side **121** may be attached to the basement portion **305** through a pair of hinges which are visible in **Figure 3A** and therein denoted with reference numeral **310.** In this way, the bottom portion **120b** can pivot relative to the front panel **120.** The basement portion **305** comprises also left and right housing walls **315** which delimitate the tank housing **110** where the collection tank **105** is accommodated. In the example at issue, in the left side of the basement portion **305** an air outlet **320** is provided, while an air inlet **325** is provided in the right side of the basement portion **305.** The tank housing **110** is placed adjacent, *i.e*. close to the air inlet **325** and the air outlet **320.** The cover element **160** is arranged between the air inlet **325** and the air outlet **320.** Moreover, tank housing **110** comprises sidewalls **330a** and **330b** that are preferably provided at the housing aperture **145** in the bottom front portion **120b** of the casing front side **121** in order to

separate the tank housing **110** from the permeable-to-air part **140,** *i.e.* from the air inlet and/or outlet **325, 320.** Sidewalls **330a** and **330b** are configured for being permeable to air so as to allow air to access the air inlet and/or outlet **325, 320.** Between the cover element **160** and the collection tank **105** two air channels **350a** and **350b** are formed, each of them being in fluid communication with the pass-through apertures **170** provided on the cover element **160** and with one of the sidewalls **330a** and **330b.**

[0040] In the example at issue, the cover element **160** is attached or attachable to the collection tank **105** by means of cover sidewalls **335a** and **335b,** which protrude from the front wall **180** of the cover element **160** towards the tank **105** and engage lateral sides of the collection tank **105,** for example by means of a snap-fit engagement. Each of said cover sidewalls **335a** and **335b,** is permeable to air so as to ensure that each of said air channels **350a** and **350b** allows a fluid communication between the air inlet and/or outlet **325, 320** and the ambient surrounding the laundry drying machine **100.** Furthermore, each of said air channels **350a** and **350b** is delimited by a delimiting wall **340a, 340b** which is impermeable to air. In this way air flowing in one channel **350a** is prevented from being mixed with air flowing through the other channel **350b.** Preferably, said delimiting wall **340a, 340b** is spaced apart from and extends towards the collection tank **105** in a manner substantially parallel to the cover sidewall **335a, 335b.** In addition, delimiting wall **340a, 340b** allows to keep the cover element **160** spaced apart from the collection tank **105** so as to define said air channel **350a, 350b.** Furthermore, delimiting wall **340a, 340b** improves robustness of the cover element **160,** preventing deformations of the latter when the user inserts the collection tank **105** in the tank housing **110** by applying a pressure on the cover element **160.**

[0041] In an embodiment of the present invention, the sidewalls **330a** and **330b** are formed, at least partly, lowered in such a way to allow air flowing therethrough. Similarly, cover sidewalls **335a** and **335b** of the cover element **160** are also formed lowered allowing air to flow therethrough.

[0042] In another embodiment according to the present invention, the sidewalls **330a, 330b, 335a** and **335b** may be provided with one or more through holes (or apertures) in order to allow air to flow therethrough.

[0043] As it can be best appreciated with reference to **Figure 3B,** the inward and outward airflow paths, schematically shown by arrows, can pass through sidewalls **330a, 330b, 335a** and **335b** to access or exiting the laundry drying machine **100** via air channels **350a, 350b** formed behind the cover element **160.** In such a way pass-through aperture formed on the cover element **160** may improve the overall inlet/outlet airflow section thereby improving the inlet/outlet airflow rate of an air circuit of the laundry machine **100,** like a condensing unit cooling air circuit.

[0044] In detail, the outlet airflow path exits the laundry drying machine **100** both through a first part of the plurality of apertures formed in the permeable-to-air part **140** both through a first part of the plurality of apertures **170** formed on the cover element **160** by passing through sidewalls **330a** and **335a.** Similarly, the inlet airflow path enters the laundry drying machine **100** both through a second part of the plurality of apertures formed on the permeable-to-air part **140,** both through a second part the plurality of apertures **170** of the cover element **160** by passing through sidewalls **330b** and **335b.**

[0045] The laundry drying machine **100** according to the present invention, features an enhanced airflow rate through both the air inlet **325** and the air outlet **320,** thanks to the cover element **160,** which grants additional paths to air to flow into/out from the laundry machine **100.** The airflow rate enhancement leads to an improvement in the overall operation of the laundry drying air circuit, since it allows a faster and more effective condensing operation.

[0046] According to the invention the number of apertures **170** formed on the cover element **160** may be the most appropriate according to the design needs. Such number may be even one. It is also understood that the one or more apertures **170** formed on the cover element **160** may be passed through by air inlet or outlet airflow only. Furthermore, a single air channel **350a, 350b** may be formed between the cover element **160** and the collection tank **105.**

Claims

1. A laundry drying machine **(100)** for treating laundry items comprising:

a drying air circuit comprising a moisture condensing element for condensing moisture from said drying air,
an air inlet **(325)** and/or an air outlet **(320)** for allowing a cooling air flow to flow into and/or out of the laundry drying machine to cool the moisture condensing element,
a collection tank **(105)** for collecting moisture condensed in the condensing element,
a tank housing **(110)** for accommodating the collection tank **(105),** said tank housing being adjacent to at least one between said air inlet and/or said air outlet and having at least one sidewall **(330a, 330b)** separating the tank housing from the adjacent air inlet and/or air outlet, and
a cover element **(160)** adapted to hide the collection tank when said collection tank is accommodated in the tank housing,
characterized in that
the cover element **(160)** is provided with one or more pass-through apertures **(170)** allowing said cooling air to flow through the cover element, and

said at least one sidewall **(330a, 330b)** is permeable to the cooling air.

2. A laundry drying machine **(100)** according to claim 1, wherein at least one air channel **(350a, 350b)** is formed between said cover element **(160)** and said collection tank **(105).**

3. A laundry drying machine **(100)** according to claim 2, wherein said at least one air channel **(350a, 350b)** is in fluid communication with the air inlet **(325)** or the air outlet **(320),** the air channel **(350a, 350b)** being delimited by a wall **(340a, 340b)** which is impermeable to the cooling air.

4. A laundry drying machine **(100)** according to any preceding claim, further comprising
a casing **(115)** adapted to enclose any component part of the laundry drying machine **(100),** said casing having a front side **(121)** with a door **(135)** providing access to a laundry drying chamber, wherein
a bottom portion **(120b)** of the casing front side **(121)** is provided with a housing aperture **(145)** for allowing the collection tank **(105)** to access the tank housing **(110),** the cover element **(160)** being flush with the bottom portion **(120b)** when the collection tank **(105)** is accommodated in the tank housing **(110).**

5. A laundry drying machine **(100)** according to claim 4, wherein the bottom portion **(120b)** of the casing front side **(121)** comprises said at least one sidewall **(330a, 330b).**

6. A laundry drying machine **(100)** according to claim 4 or 5, wherein the casing front side **(121)** comprises a front panel **(120)** accommodating the door **(135)** and the bottom portion **(120b)** of the casing front side **(121)** is pivotable relative to the front panel **(120).**

7. A laundry drying machine **(100)** according to any preceding claim, wherein the cover element **(160)** comprises a front wall **(180)** carrying said one or more pass-through apertures **(170),** and further comprises at least one cover sidewall **(335a, 335b)** protruding from the front wall **(180),** said at least one cover sidewall **(335a, 335b)** being permeable to the cooling air.

8. A laundry drying machine **(100)** according to claim 7, wherein the cover element **(160)** is attached or attachable to the collection tank **(105)** by engaging the at least one cover sidewall **(335a, 335b)** with a lateral side of the collection tank **(105).**

9. A laundry drying machine **(100)** according to any of the preceding claims 1 to 7, wherein the cover element **(160)** is formed integral with the collection tank **(105).**

10. A laundry drying machine **(100)** according any claim 4 to 7, wherein the cover element **(160)** is pivotally fixed to the bottom portion **(120b)** of the casing front side **(121)** so as to cover the housing aperture **(145).**

11. A laundry drying machine **(100)** according to any of the preceding claims, wherein the cover element **(160)** comprises a grasping portion **(165)** adapted to be grasped by a user hand.

12. A laundry drying machine **(100)** according to claim 11 wherein said one or more pass-through apertures **(170)** are provided around the grasping portion **(165).**

13. A laundry drying machine **(100)** according to claim 11 or 12 wherein the grasping portion **(165)** is formed on the cover element **(160)** as a depression or setback part.

14. A laundry drying machine **(100)** according to any of the preceding claim when dependent from claim 3 wherein a first air channel **(350a)** is in fluid communication with the air inlet **(325)** and a second air channel **(350b)** is in fluid communication with the air outlet **(320),** said impermeable-to-air wall **(340a, 340b)** fluidly separating the first air channel **(350a)** from the second air channel **(350b).**

15. A laundry drying machine **(100)** according to any of the preceding claim comprising an air inlet **(325)** and an air outlet **(320),** the cover element **(160)** being arranged between the air inlet **(325)** and the air outlet **(320).**

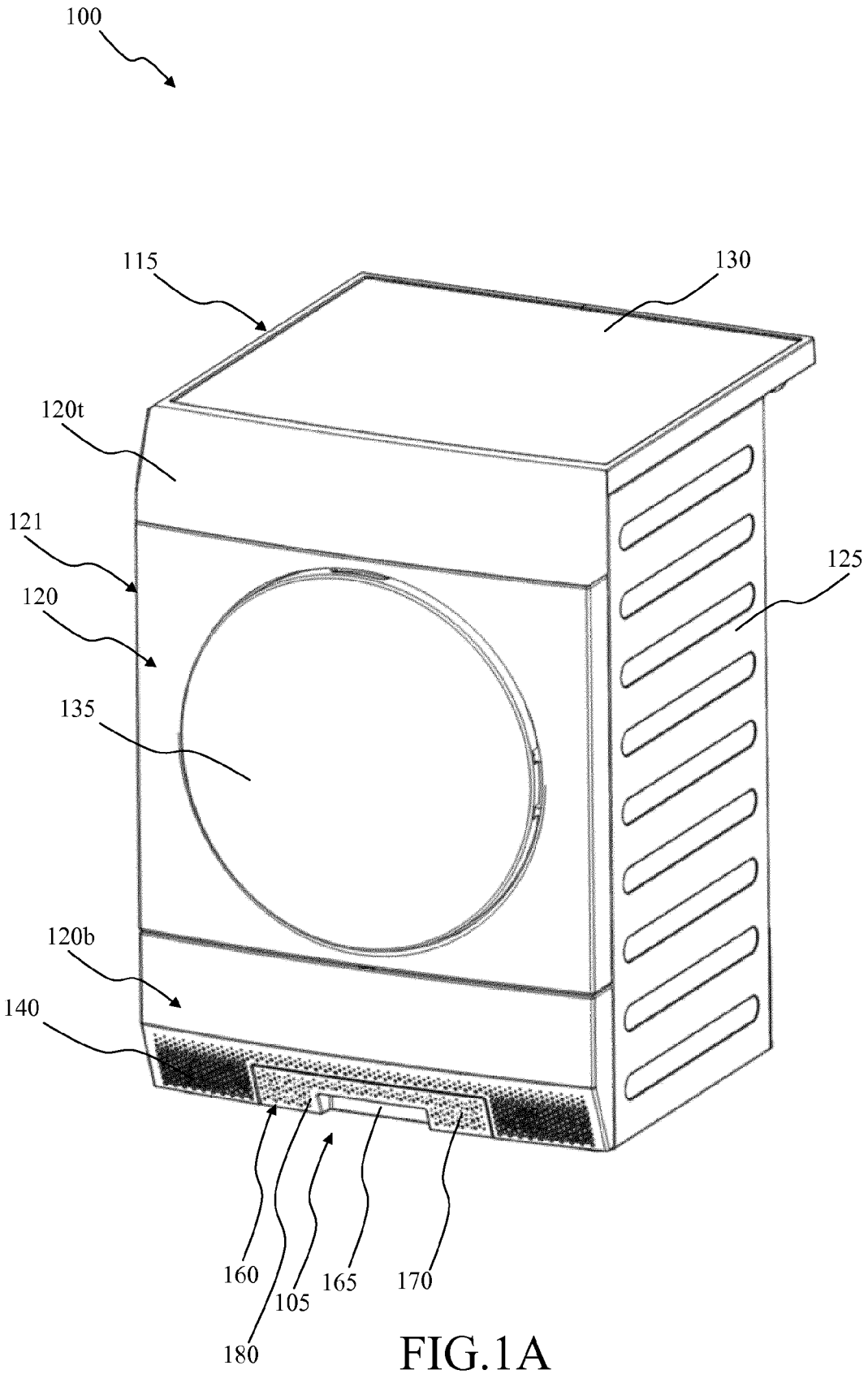

FIG.1A

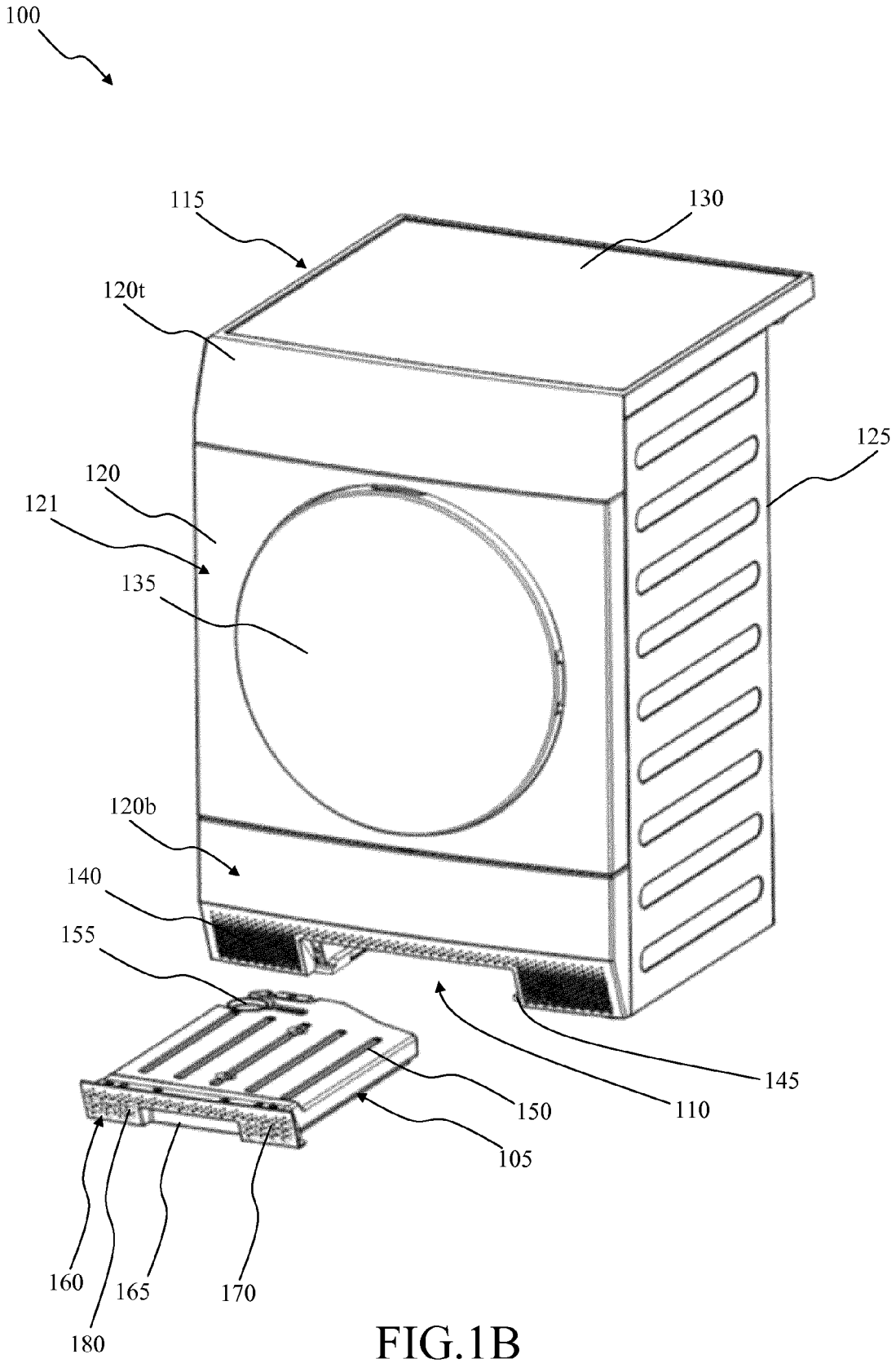
100
115
130
120t
125
120
121
135
120b
140
155
145
150
110
105
160
165
170
180

FIG.1B

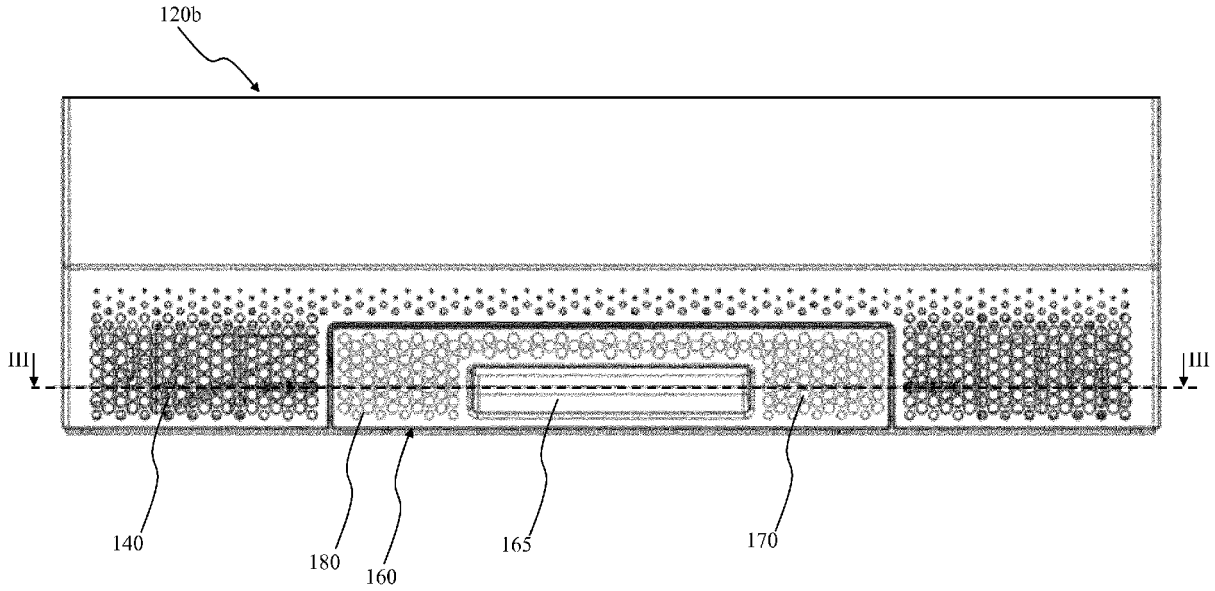

FIG.2

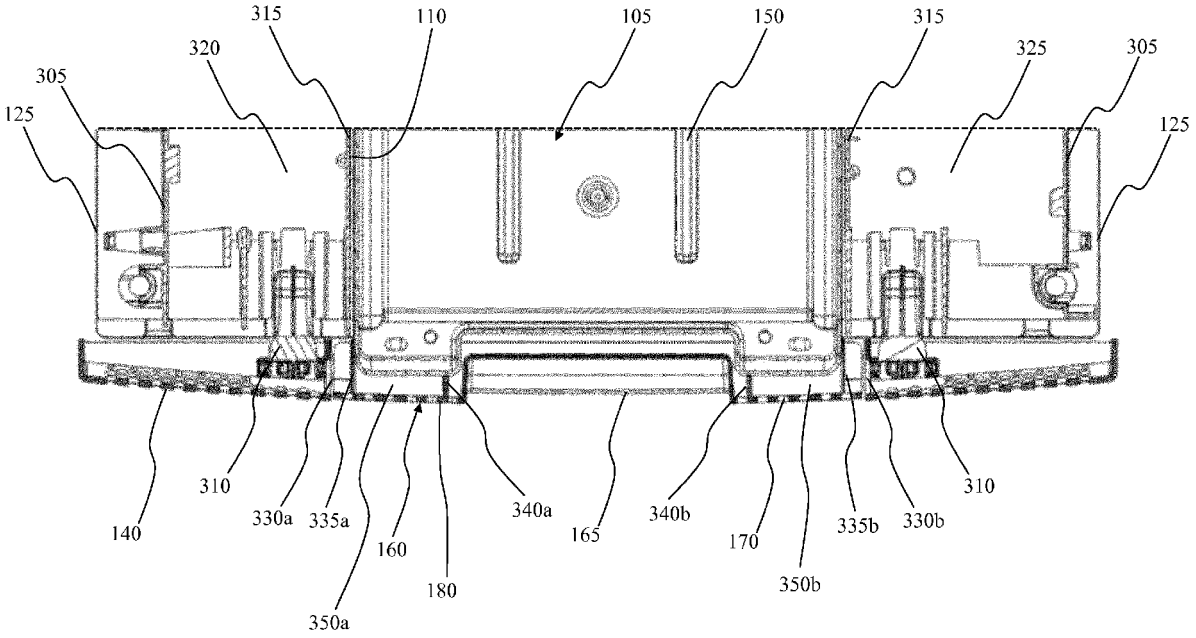
315
110
105
150
315
320
325
305
305
125
125
310
330a
335a
340a
340b
335b
330b
310
140
160
165
170
180
350a
350b

FIG.3A

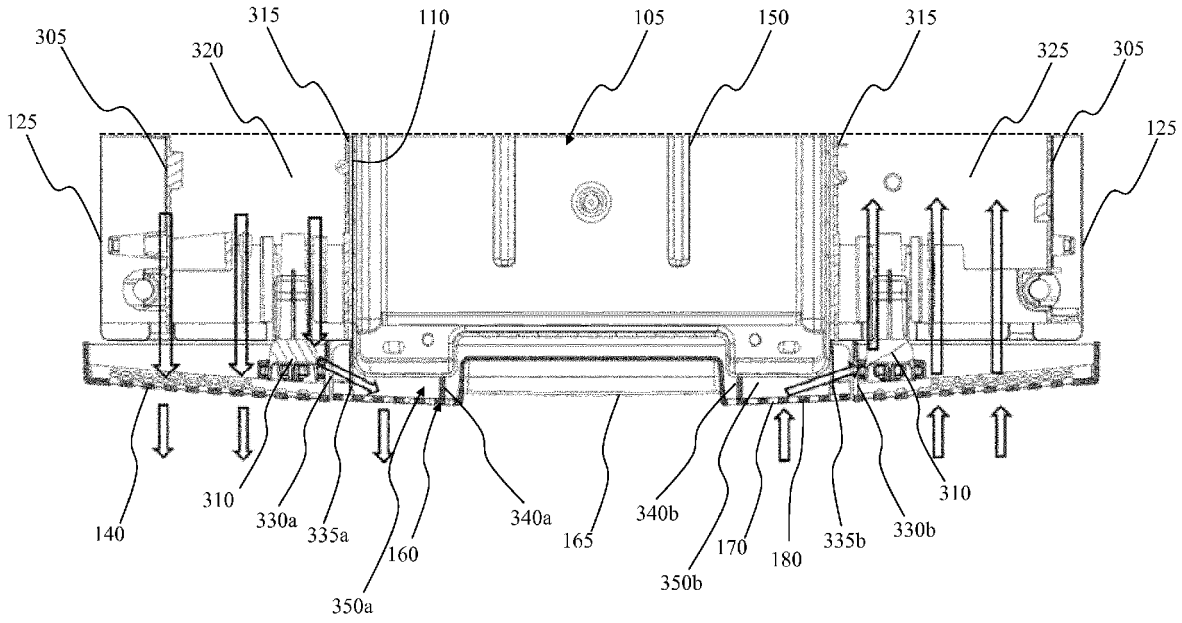
305
315
110
105
150
315
325
305
320
125
125
310
330a
335a
160
340a
165
340b
170
180
335b
330b
310
140
350a
350b

FIG.3B

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 12 19 7435

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2 742 708 A (HOWARD MCCORMICK FRANCIS) 24 April 1956 (1956-04-24) * column 2, line 25 - column 3, line 45; figures 1-9 *	1	INV. D06F58/20 D06F58/24
A	EP 1 674 607 A1 (CANDY SPA [IT]) 28 June 2006 (2006-06-28) * paragraph [0008] - paragraph [0022]; figures 1,2 *	1	
A	GB 2 026 147 A (LICENTIA GMBH) 30 January 1980 (1980-01-30) * figure 1 *	1	
A	EP 1 108 811 A1 (WHIRLPOOL CO [US]) 20 June 2001 (2001-06-20) * paragraph [0015] - paragraph [0021]; figures 2,4 *	1	
A	EP 2 527 529 A1 (ELECTROLUX HOME PROD CORP [BE]) 28 November 2012 (2012-11-28) * paragraph [0011] - paragraph [0070]; figures 1-7 *	1	TECHNICAL FIELDS SEARCHED (IPC) D06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 June 2013	Engelhardt, Helmut

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

1

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 19 7435

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

03-06-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2742708 A	24-04-1956	NONE	
EP 1674607 A1	28-06-2006	NONE	
GB 2026147 A	30-01-1980	DE 2831932 A1	07-02-1980
		GB 2026147 A	30-01-1980
		NL 7905127 A	22-01-1980
EP 1108811 A1	20-06-2001	DE 19960217 A1	19-07-2001
		EP 1108811 A1	20-06-2001
		ES 2214208 T3	16-09-2004
EP 2527529 A1	28-11-2012	NONE	