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(54) **Rotary-drum laundry dryer**

(57) A rotary-drum laundry dryer (1) comprising a revolving drum (3) structured for housing the laundry to be dried, a hot-air generator (6) structured to supply a stream of hot air through said revolving drum (3), and a lower supporting basement (11) which is structured for resting on the floor and for housing at least part of the hot-air generator (6). The hot-air generator (6) in turn comprises:
- an air conduit; and
- air circulating means which are located along the air conduit and are structured to produce, inside the air conduit, an airflow (f) which flows through the revolving drum (3) and over the laundry inside the drum (3). The rotary-drum laundry dryer (1) is characterized in that the rear wall (2b) of the dryer (1) comprises a supporting bulkhead (14a) made of plastic material. A central bulge (141a) is provided on the supporting bulkhead (14a) and a portion (142b) of a scroll (150) of an impeller straddles a bridge element (144a) carried out in the supporting bulkhead (14a); so that an empty undercut (220) being formed between the bridge element (144a) and the portion (142b) of the scroll (150).

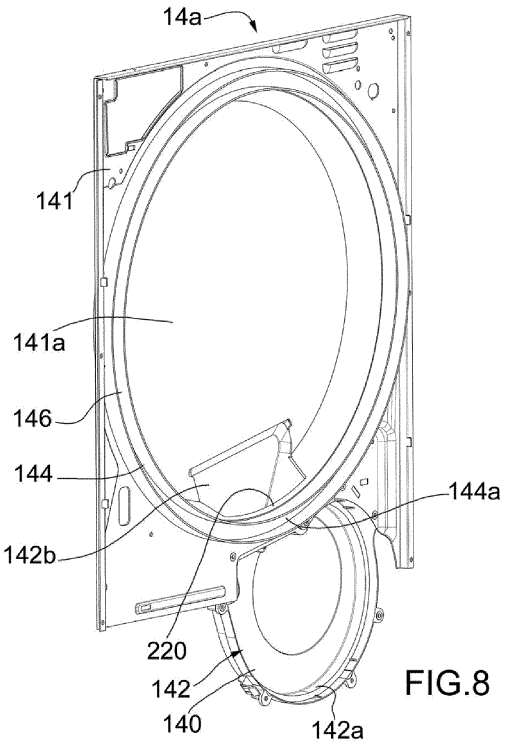


FIG.8

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## Description

**[0001]** The present invention relates to a rotary-drum laundry dryer.

**[0002]** In particular, the present invention relates to a rotary-drum home laundry dryer to which the following description refers purely by way of example without implying any loss of generality.

**[0003]** As is known, rotary-drum home laundry dryers currently on the market generally comprise: a substantially parallelepiped-shaped, outer boxlike casing structured for resting on the floor; a substantially cylindrical rotatable drum which is structured for housing the laundry to be dried and is housed in axially rotating manner inside the casing in order to rotate about an horizontally-oriented longitudinal reference axis, directly facing a laundry loading/unloading opening formed in the front wall of the casing; a porthole door hinged to the front wall of the casing to rotate to and from a closing position in which the door rests completely against the front wall of the casing to close the laundry loading/unloading opening and airtight seal the rotatable drum; an electrically-powered motor assembly which is housed inside the casing and is structured for driving into rotation the rotatable drum about its longitudinal reference axis; an open-circuit or closed-circuit, hot-air generator which is housed inside the casing and is structured to circulate inside the rotatable drum a stream of hot air which has a very low moisture content and flows through the rotatable drum and over the laundry inside the drum to rapidly dry the laundry; and finally an electronic central control unit which controls both the motor assembly and the hot-air generator to perform, on command, one of the user-selectable drying cycles stored in the same central control unit.

**[0004]** In a first kind of rotary-drum home laundry dryers currently on the market, the rotatable drum furthermore consists in a substantially cylindrical rigid tubular body having open ends, while in a second kind of rotary-drum home laundry dryers said substantially cylindrical rigid tubular body has one end which is closed by a bottom wall rigidly fixed to the tubular body. In both cases, the rotatable drum extends substantially horizontally inside the boxlike casing, locally aligned to the laundry loading/unloading opening, and is structured for resting on a number of idle supporting rollers which are arranged at the two axial ends of the tubular body locally parallel to the drum longitudinal reference axis, and are attached to the appliance casing in free revolving manner so as to allow the tubular body to freely rotate about its horizontally-oriented longitudinal reference axis.

**[0005]** The front rim of the tubular body surrounds the laundry loading/unloading opening and is coupled in axially rotating manner to the front wall of the boxlike casing; whereas the rear rim of the tubular body abuts against the rear wall of the boxlike casing and is coupled in axially rotating manner directly to said rear wall. By the way, the front wall comprises an annular frame and a covering panel; the covering panel belonging to the cabinet of the laundry dryer. In actual use the covering panel covers the annular frame.

**[0006]** The stream of hot air produced by the hot-air generator usually enters into the tubular body via an intake air-vent made in the rear wall of the boxlike casing, within the perimeter of the rear rim of the tubular body, flows inside the tubular body for the entire length of the latter, and finally comes out of the tubular body via an escape air-vent usually carried out on the annular frame that delimits the laundry loading/unloading opening on the front wall of the casing.

**[0007]** To avoid air leakages from the two axial ends of the tubular body, a first circular sealing gasket is generally interposed between the front rim of the tubular body and the front wall of the casing, whereas a second circular sealing gasket is generally interposed between the rear rim of the tubular body and the rear wall of the appliance casing.

**[0008]** In most of the rotary-drum home laundry dryers currently on market, the first and the second circular sealing gaskets are usually recessed into a circular groove carried out on the front and rear wall of the casing, respectively, and are firmly hold in the groove so as to remain stationary when the rotatable drum rotates about its longitudinal reference axis.

**[0009]** Since, during a drying process, laundry within the rotatable drum may tangle due to the rotational movement of the drum itself, the back of the rotatable drum, i. e. the rear wall of the boxlike casing or the bottom wall fixed to the tubular body of the drum, may be provided with an anti-entangling nose that protrudes from the rear wall closing the rear end of the drum tubular body, roughly at centre of the rear rim of the tubular body, and extends inside the tubular body locally substantially parallel to the drum longitudinal reference axis. This nose is shaped/dimensioned so to prevent, when the drum rotates, the laundry from entangling and block the hot-air intake vent located on said wall or unbalance the drum rotation.

**[0010]** Aim of the present invention is to simplify the structure of the rear wall of the boxlike casing so as to significantly reduce the appliance production costs and simplifying the drying machine assembling process.

**[0011]** In compliance with the above aims, according to the present invention there is provided a rotary-drum laundry dryer comprising a revolving drum structured for housing the laundry to be dried, a hot-air generator structured to supply a stream of hot air through said revolving drum, and a lower supporting basement which is structured for resting on the floor and for housing at least part of the hot-air generator. The hot-air generator in turn comprises:

- an air conduit; and
- air circulating means which are located along the air conduit and are structured to produce, inside the air conduit, an airflow which flows through the revolving drum and over the laundry inside the drum. The rotary-drum laundry dryer is **characterized in that** the

rear wall of the dryer comprises a supporting bulkhead made of plastic material; a central bulge being provided on such supporting bulkhead and at least a portion of a scroll of an impeller straddling a bridge element carried out in said supporting bulkhead, so that an empty undercut being formed between said bridge element and said at least a portion of the scroll.

**[0012]** A number of non-limiting embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

- Figures 1 is a perspective view of a rotary-drum home laundry dryer made in accordance with the teachings of the present invention;
- Figure 2 is a transversal section view of the Figure 1 laundry dryer;
- Figures 3 is a perspective view with parts removed for clarity sake of an embodiment of a rotary-drum home laundry dryer made in accordance with the teachings of the present invention;
- Figure 4 is a partly exploded perspective view of a first solution of the laundry dryer of Figure 3;
- Figure 5 is a front view of a part of the laundry dryer of Figure 4;
- Figure 6 is a longitudinal section C-C of the laundry dryer of Figure 5;
- Figure 7 is a perspective rear view of the rear wall of the laundry dryer of Figures 3-6;
- Figure 8 is a perspective front view of the rear wall of the laundry dryer of Figures 3-7;
- Figure 9 is a partly exploded perspective view of a second solution of the laundry dryer of Figure 3.

**[0013]** With reference to Figures 1 and 2, reference number 1 indicates as a whole a rotary-drum home laundry dryer.

**[0014]** The rotary-drum home laundry dryer comprises:

- a preferably, though not necessarily, parallelepiped-shaped, outer boxlike casing 2 which is built for resting on the floor and is provided with reciprocally-faced front and rear walls 2a and 2b;
- a substantially cylindrical, sleeve-shaped rotatable drum 3 (Figure 2) structured for housing the laundry to be dried, and which is fixed in axially rotating manner inside the outer casing 2, directly facing a laundry loading/unloading pass-through opening formed on the preferably substantially vertically-oriented, front wall 2a of casing 2;
- and a porthole door 4 hinged to the front wall 2a of casing 2 so to be able to rotate about a preferably, though not necessarily, vertically-oriented reference axis, to and from a closing position in which door 4 rests completely against the front wall 2a to close the laundry loading/unloading opening and substantially airtight seal the rotatable drum 3.

**[0015]** Inside the boxlike casing 2, the laundry dryer 1 additionally comprises:

- an electrically-powered motor assembly (not shown) structured for driving into rotation the rotatable drum 3 about its longitudinal reference axis;
- an open-circuit or closed-circuit, hot-air generator 6 (Figure 2) which is structured to circulate through the rotatable drum 3 a stream of hot air having a low moisture level, and which flows over and rapidly dries the laundry located inside the rotatable drum 3; and
- an electronic central control unit (not shown) which controls both the motor assembly and the hot-air generator 6 to perform, on command, one of the user-selectable drying cycles preferably, though not necessarily, stored in the same central control unit.

**[0016]** In the present invention preferably, though not necessarily, the hot-air generator 6 can be a heat-pump which is envisaged for gradually drawing air from the rotatable drum 3; rapidly cooling down the wet air arriving from the rotatable drum 3 so to extract and retain the surplus moisture in the air drawn from the rotatable drum 3; and then rapidly heating the dehumidified air to a predetermined temperature, normally higher than the temperature of the air coming from the rotatable drum 3; and finally feeding the heated, dehumidified air back into the rotatable drum 3, where the air flows over the laundry inside the drum to rapidly dry said laundry. A heat-pump is particularly suitable in carrying out the invention because the dry air which is used for drying the laundry has a quite low temperature and therefore it doesn't damage the plastic components of the casing.

**[0017]** In greater detail the heat-pump assembly (non shown in detail) comprises a first and a second air/refrigerant heat exchangers located inside the air recirculating conduit 21, preferably downstream of the centrifugal fan. The first air/refrigerant heat exchanger, traditionally referred to as the "evaporator" of the heat-pump circuit, is located inside the air recirculating conduit 21 preferably downstream of the centrifugal fan, and is structured to remove/absorb heat from the airflow arriving from rotatable drum 3, thus forming the air cooling means of the hot-air generator 6. The second air/refrigerant heat exchanger, traditionally referred to as the "condenser" of the heat-pump circuit, is instead located inside the air recirculating conduit 21 downstream of the first air/ refrigerant heat exchanger, and is structured to release heat to the airflow arriving from the first air/refrigerant heat exchanger, thus forming the air heating means of the hot-air generator 6.

**[0018]** As an alternative, the air heating means of hot-air generator 6 may comprise a resistor located inside the air recirculating conduit 21 (figure 2), preferably downstream of the centrifugal fan, whereas the air cool-

ing means of hot-air generator 6 may comprise an air/air heat exchanger that uses the external air to cool down the airflow arriving from the rotatable drum 3.

**[0019]** With reference in particular to Figure 2 the rotatable drum 3 preferably consists in a substantially cylindrical-shaped, rigid tubular body preferably made of metal material and which extends inside the boxlike casing 2 coaxial to a preferably substantially horizontally-oriented, longitudinal reference axis L while remaining locally substantially aligned to the laundry loading/unloading opening on the front wall 2a of the boxlike casing 2. The substantially cylindrical-shaped, rigid tubular rotatable drum 3 is furthermore preferably structured for resting on a number of idle supporting rollers 8 which are arranged approximately at the two axial ends of the rotatable drum 3 with their rotation axis locally substantially parallel to the longitudinal reference axis L of the rotatable drum 3; and are fitted in free revolving manner so as to allow the rotatable drum 3 to freely rotate about its longitudinal reference axis L inside the boxlike casing 2.

**[0020]** In addition to the above, a circular front rim 3f (Figure 2) of the rotatable drum 3 surrounds the laundry loading/unloading opening carried out on the front wall 2a of boxlike casing 2 and is coupled in substantially airtight and axially rotating manner to the front wall 2a, preferably with the interposition of a first circular sealing gasket 9. A circular rear rim 3r of rotatable drum 3 instead abuts against the preferably substantially vertically-oriented, rear wall 2b of boxlike casing 2 and is coupled in substantially airtight and axially rotating manner directly to said rear wall 2b with the interposition of a second circular sealing gasket 10. Both front and rear circular sealing gaskets 9 and 10 are obviously substantially coaxial with the longitudinal reference axis L of the rotatable drum 3.

**[0021]** With reference to Figure 2, the stream of hot air produced by the hot-air generator 6 preferably enters into the rotatable drum 3 through the rear end of the rotatable drum 3, i.e. the end of the rotatable drum 3 delimited by the rear rim 3r, flows inside the rotatable drum 3 for the entire length of the latter, and finally comes out of rotatable drum 3 through the front end of the rotatable drum 3, i.e. the end of the rotatable drum 3 delimited by the front rim 3f, or vice versa.

**[0022]** In other words, the stream of hot air produced by the hot-air generator 6 preferably enters the rotatable drum 3 via an intake air-vent located in the rear wall 2b of the boxlike casing 2 and locally aligned to the rear end of the rotatable drum 3, i.e. within the perimeter of the rear rim 3r of the rotatable drum 3, and comes out of rotatable drum 3 via an escape air-vent which is preferably located either on the porthole door 4 that selectively closes the laundry loading/unloading opening of front wall 2a, or directly on the front wall 2a of the boxlike casing 2, preferably very close to the laundry loading/unloading opening.

**[0023]** With reference to Figures 1, 2 and 3 the outer boxlike casing 2 preferably comprises a substantially parallelepiped-shaped lower supporting basement or socle 11 which is structured for resting on the floor and preferably also for housing at least part of the hot-air generator 6; and a substantially parallelepiped-shaped upper boxlike cabinet 12 which is rigidly fixed to the top of the lower supporting basement or socle 11 and it is structured so as to house the rotatable drum 3.

**[0024]** With reference to Figure 2, in the example shown, in particular, the circular sealing gasket 9 is preferably, though not necessarily, stationary recessed into a circular groove or seat made on a front frame or bulkhead 13 which is preferably associated to a front panel of the upper boxlike cabinet 12, thereby forming the front wall 2a of casing 2. The circular sealing gasket 9 is arranged into the circular groove or seat so as to completely surround the laundry loading/unloading opening on the front wall 2a of the casing 2, and the front rim 3f of the rotatable drum 3 abuts directly against said front circular sealing gasket 9.

**[0025]** With reference to Figure 2 the circular sealing gasket 10 is firmly fixed to the rear wall of the upper boxlike cabinet 12, i.e. to the rear wall 2b of the boxlike casing 2, and the intake air-vent of hot-air generator 6 is incorporated into the same rear wall of the upper boxlike cabinet 12, i.e. into the rear wall 2b of the boxlike casing 2.

**[0026]** As shown in Figures 3 the rear wall 2b of casing 2 preferably comprises a substantially flat vertically-oriented supporting panel or supporting bulkhead 14a. The supporting bulkhead 14a is made in a plastic, i.e. polymeric, material by means for instance of an injection molding process.

**[0027]** The hot-air generator 6 (in particular a heat-pump), in turn, is structured so as to communicate with, i.e. to be fluidly connected to, the inner cavity 19 made inside the rear wall of the upper boxlike cabinet 12, i.e. inside the rear wall 2b of casing 2, so as to circulate the stream of hot air to and from said inner cavity 19.

**[0028]** In other words, with reference to Figure 2, the hot-air generator 6 provides for continually dehumidifying and heating the air circulating inside rotatable drum 3 to rapidly dry the laundry located inside the drum 3, and preferably comprises:

- an air recirculating conduit 21 having a first end in communication with, i.e. fluidly connected to, the inner cavity 19 arranged inside the rear wall 2b of casing 2, and a second end in communication with, i.e. is fluidly connected to, the front end of the rotatable drum 3;
- an electrically-powered centrifugal fan (not shown) or other type of air circulating pump, which is located along the air recirculating conduit 21 and is structured to produce an airflow f which flows in closed loop through the air recirculating conduit 21 and the rotatable drum 3;
- air cooling means (not shown) which are located along the air recirculating conduit 21 preferably, thought not necessarily, upstream of the air centrif-

ugal fan, and are structured to rapidly cool the moist air arriving from rotatable drum 3 so as to cause the condensation of the surplus moisture inside the airflow f; and

- air heating means (not shown) which are located along the air recirculating conduit 21, downstream of the air cooling means and preferably also upstream of the air centrifugal fan, and which are structured for rapidly heating the dehumidified airflow f arriving from the air cooling means and directed back to rotatable drum 3, so that the airflow f directed back into rotatable drum 3 is heated to a temperature preferably, though not necessarily, higher than or equal to that of the moist air flowing out of rotatable drum 3.

**[0029]** In the example shown, in particular, the second end of the air recirculating conduit 21 communicates with, i.e. is fluidly connected to, the front end of the rotatable drum 3 via a pass-through opening made in a substantially funnel-shaped coupling element of front bulkhead 13 that delimits/surrounds the laundry loading/unloading opening on the front panel of the upper boxlike cabinet 12, i.e. on the front wall 2a of casing 2.

**[0030]** Furthermore, in the example shown a central/intermediate section of the air recirculating conduit 21 preferably extends in pass-through manner across the lower supporting basement 11 of casing 2, and the air cooling means and air heating means are preferably completely housed inside said central/ intermediate section of the air recirculating conduit 21. Advantageously, the lower supporting basement 11 is formed by two shells coupled one onto the other, forming at least a portion of the air recirculating conduit 21 and further cavities adapted to receive therein further operational components of the dryer for operating a drying process on a laundry mass. Further advantageously, the lower supporting basement 11 is made of plastic through an injection mounding process.

**[0031]** In the embodiments of Figures 3-9 the concavity of a first cup-shaped face 142 of a scroll 150 of a centrifugal impeller (not shown) is directed inwardly, i.e. toward the rotatable drum 3, and toward the supporting rollers 8. Moreover, the concavity of the first cup-shaped face 142 of the scroll 150 is oriented as the concavity of a central bulge 141a.

**[0032]** As illustrated in Figures 4 and 9 a second cup-shaped face 143 of the scroll 150 is preferably carried out in one piece with the lower supporting basement 11.

**[0033]** In such a case the rectangular main body 141 of the supporting bulkhead 14a is provided with the aforesaid substantially circular central bulge 141a surrounded by a continuous circular groove 144 (or by a substantially cylindrical gasket-supporting collar) (Figure 8) able to house a corresponding circular sealing gasket 10 (Figures 4, 9).

**[0034]** More in detail, the aforesaid first cup-shaped face 142 comprises a first substantially circular portion 142a and a second trumpet-shaped portion 142b (Figure 8). The first substantially circular portion 142a protrudes downwardly from the rectangular main body 141, wherein the second trumpet-shaped portion 142b protrudes radially into the circular central bulge 141a and is integral with the central bulge 141a. Of course, the circular portion 142a and the second trumpet-shaped portion 142b are fluidly mutually connected. Moreover, the concavity of the first substantially circular portion 142a of the first cup-shaped face 142 is oriented as the concavity of the central bulge 141a.

**[0035]** The second trumpet-shaped portion 142b straddles a bridge element 144a which is a portion of the continuous circular groove 144. In such a case, an empty undercut 220 is formed between the bridge element 144a (Figure 8) and the second trumpet-shaped portion 142b. The rear wall 2b, the supporting bulkhead 14a, at least a portion 142b of the scroll 150 of an impeller and the bridge element 144a are made in a single unitary piece of plastic, i.e. polymeric material. Preferably they are formed through an injection molding process. For carrying out such an empty undercut 220 in the injection mould (not shown) a movable element (non shown) is purposely provided.

**[0036]** In other words, the portion 142b of the scroll 150 of the impeller straddles the bridge element 144a which is a portion of the continuous circular groove 144; the portion 142b protruding into the central bulge 141a (and integral with the central bulge 141a), and an empty undercut 220 is then formed between the bridge element 144a and the portion 142b of the scroll 150.

**[0037]** In a first solution illustrated in Figure 4 the circular end of the rotatable drum 3 facing the supporting bulkhead 14a is closed by a closure disk 250 at least partially perforated for permitting the drying air flow.

**[0038]** In a further solution (Figure 9) a separate disk 251 partially perforated for allowing the flow of drying air is foreseen. The disk 251 is surrounded by a flange 251 (carried out in one piece with the disk 251) which is shaped as a circular crown. The disk 251 is attached to the rectangular main body 141 for instance by means of screws (not shown). A circular rim 252 is further provided which is also attached to the rectangular main body 141 also for instance by means of screws (not shown). In another embodiment the circular rim 262 is attached to the flange 251a.

**[0039]** Thus, between the disk 251 and circular rim 252 a circular groove (not shown) is formed wherein a gasket 10 can be housed. Therefore, in actual use a circular edge 33 of the rotatable drum 3 (Figure 9) is urged against the gasket 10.

**[0040]** Preferably, though not necessarily, a laundry anti-entangling nose 17 is provided too. Preferably, the laundry anti-entangling nose 17 protrudes inwardly from the supporting bulkhead 14a and extends in use inside the rotatable drum 3 preferably while remaining locally substantially coaxial to the longitudinal reference axis L of the rotatable drum 3, and is properly shaped/dimensioned so as to prevent, when the rotatable drum 3 ro-

tates, the entangling of the damp laundry located into the rotatable drum 3. The anti-entangling nose 17 is furthermore preferably substantially frustoconical in shape.

**[0041]** General operation of the rotary-drum home laundry drier 1 is clearly inferable from the above description, with no further explanation required.

**[0042]** The advantages connected to the particular structure of the rear wall of the boxlike casing are large in number.

**[0043]** For instance, the fact that the concavity of the first substantially circular portion of the first cup-shaped face is oriented as the concavity of the central bulge allows to significantly reducing the number of component parts while improving their coupling.

**[0044]** Clearly, changes may be made to the rotary-drum home laundry drier as described herein without, however, departing from the scope of the present invention.

## Claims

1. Rotary-drum laundry dryer (1) comprising a revolving drum (3) structured for housing the laundry to be dried, a hot-air generator (6) structured to supply a stream of hot air through said revolving drum (3), and a lower supporting basement (11) which is structured for resting on the floor and for housing at least part of the hot-air generator (6);
the hot-air generator (6) in turn comprising:

    - an air conduit; and
    - air circulating means which are located along the air conduit and are structured to produce, inside the air conduit, an airflow (f) which flows through the revolving drum (3) and over the laundry inside the drum (3);
    the rotary-drum laundry dryer **being characterized in that** the rear wall (2b) of the dryer (1) comprises a supporting bulkhead (14a) made of plastic material; a central bulge (141a) being provided on such supporting bulkhead (14a) and at least a portion (142b) of a scroll (150) of an impeller straddling a bridge element (144a) carried out in said supporting bulkhead (14a), so that an empty undercut (220) being formed between said bridge element (144a) and said at least a portion (142b) of the scroll (150).

2. Rotary-drum laundry dryer, according to Claim 1, **characterized in that** said at least a portion (142b) of the scroll (150) protrudes into said central bulge (141a), and is integral with said central bulge (141a).

3. Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** the scroll (150) comprises a first cup-shaped face (142) having a first substantially circular portion (142a) and a second trumpet-shaped portion (142b); the concavity of said first substantially circular portion (142a) of the first cup-shaped face (142) is oriented as the concavity of the central bulge (141a).

4. Rotary-drum laundry dryer, according to any of the foregoing Claims, **characterized in that** the scroll (150) comprises a second cup-shaped face (143) which is carried out in one piece with said lower supporting basement (11) of the dryer.

5. Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** an end of the rotatable drum (3) facing the supporting bulkhead (14a) is closed by means of a closure disk (250, 251) which is at least partially perforated for permitting the drying air flow.

6. Rotary-drum laundry dryer, according to Claim 5 wherein said disk (250) is fixed to the end of the rotatable drum (3) facing the supporting bulkhead (14a).

7. Rotary-drum laundry dryer, according to Claim 5 wherein said disk (251) is attached to said supporting bulkhead (14a).

8. Rotary-drum laundry dryer, according to Claim 7, **characterized in that** said disk (251) is surrounded by a flange (251a) and a rim (252) is further provided which is also attached to said supporting bulkhead (14a) or to said flange (251a); between said disk (251) and said rim (252) a circular groove being formed wherein a gasket (10) is housed.

9. Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** said bridge element (144a) is a portion of a groove (144) which surrounds said central bulge (141a).

10. Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** the rear wall (2b), the supporting bulkhead (14a), the at least a portion (142b) of the scroll (150) of an impeller and the bridge element (144a) are made in a single unitary piece of polymeric material.

11. Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** said hot-air generator (6) comprises an air heating device for increasing temperature of said airflow (f), and further comprises an air cooling device for removing moisture from the airflow (f).

12. Rotary-drum laundry dryer, according to Claim 11, **characterized in that** said hot-air generator (6) comprises a heat-pump assembly.

**13.** Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** said revolving drum (3) is supported by rollers (8).

**14.** Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** the lower supporting basement (11) is formed by two shells coupled one onto the other.

**15.** Rotary-drum laundry dryer, according to anyone of the foregoing Claims, **characterized in that** the lower supporting basement (11) is made of plastic.

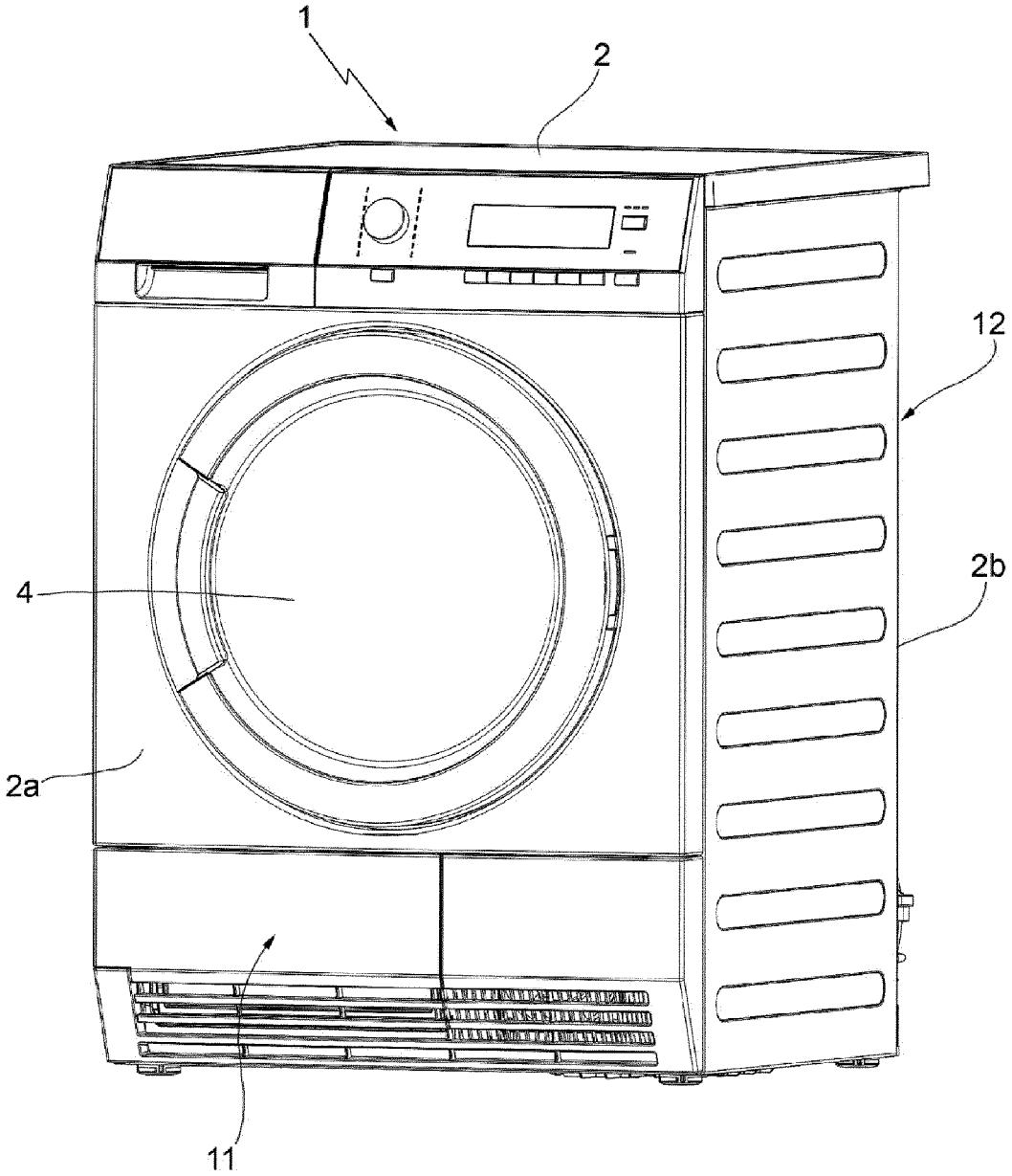


FIG.1

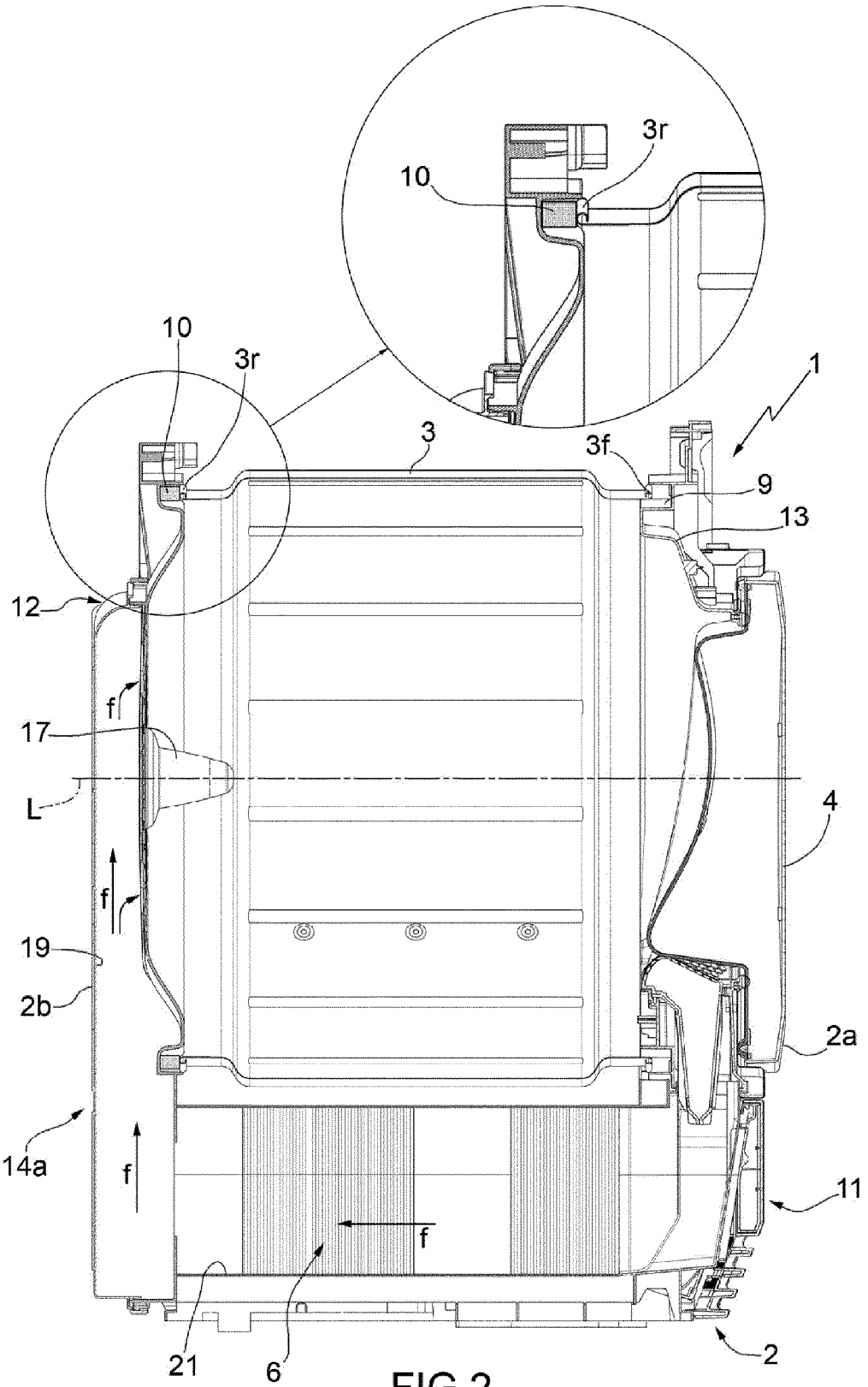


FIG.2

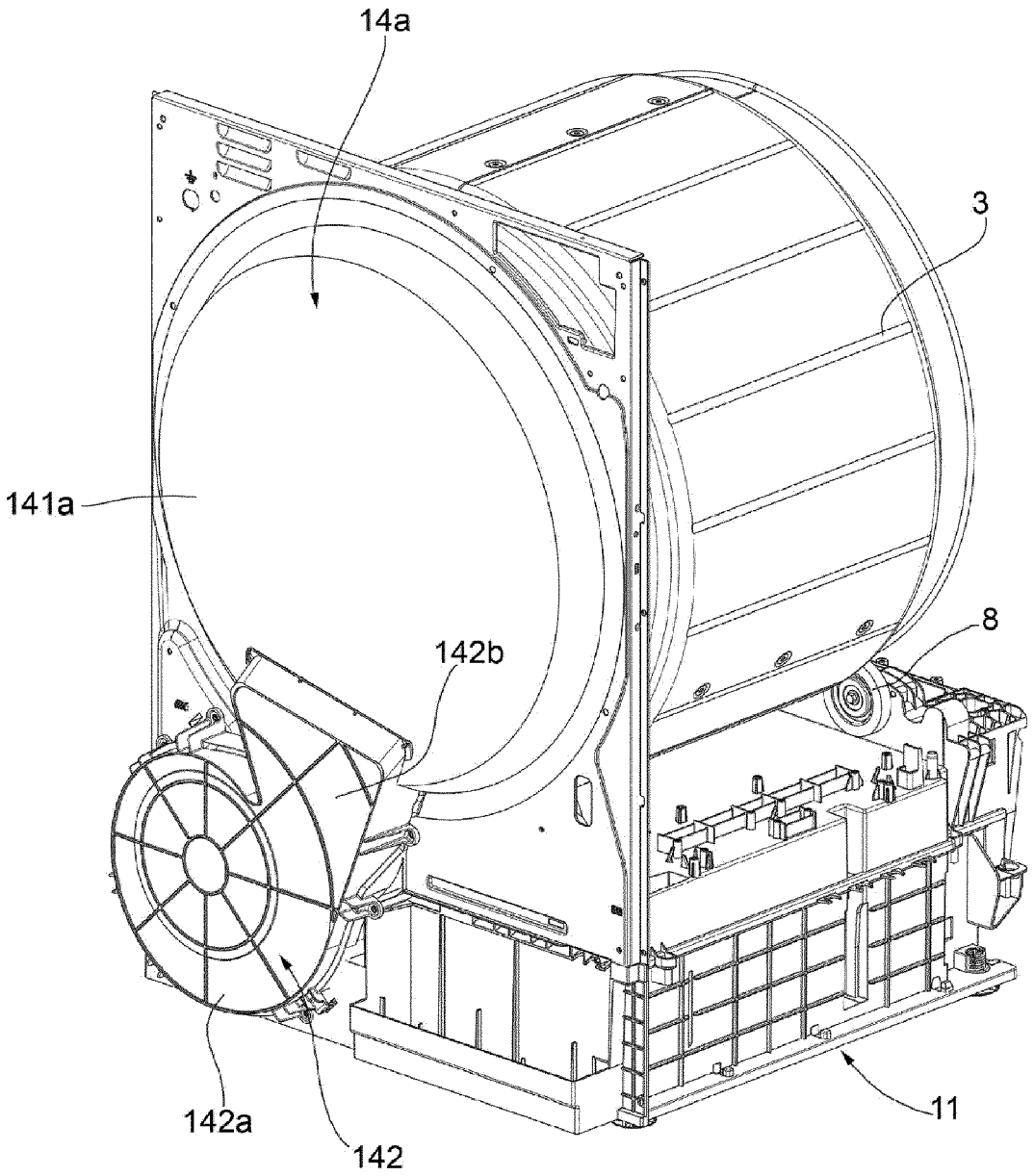


FIG. 3

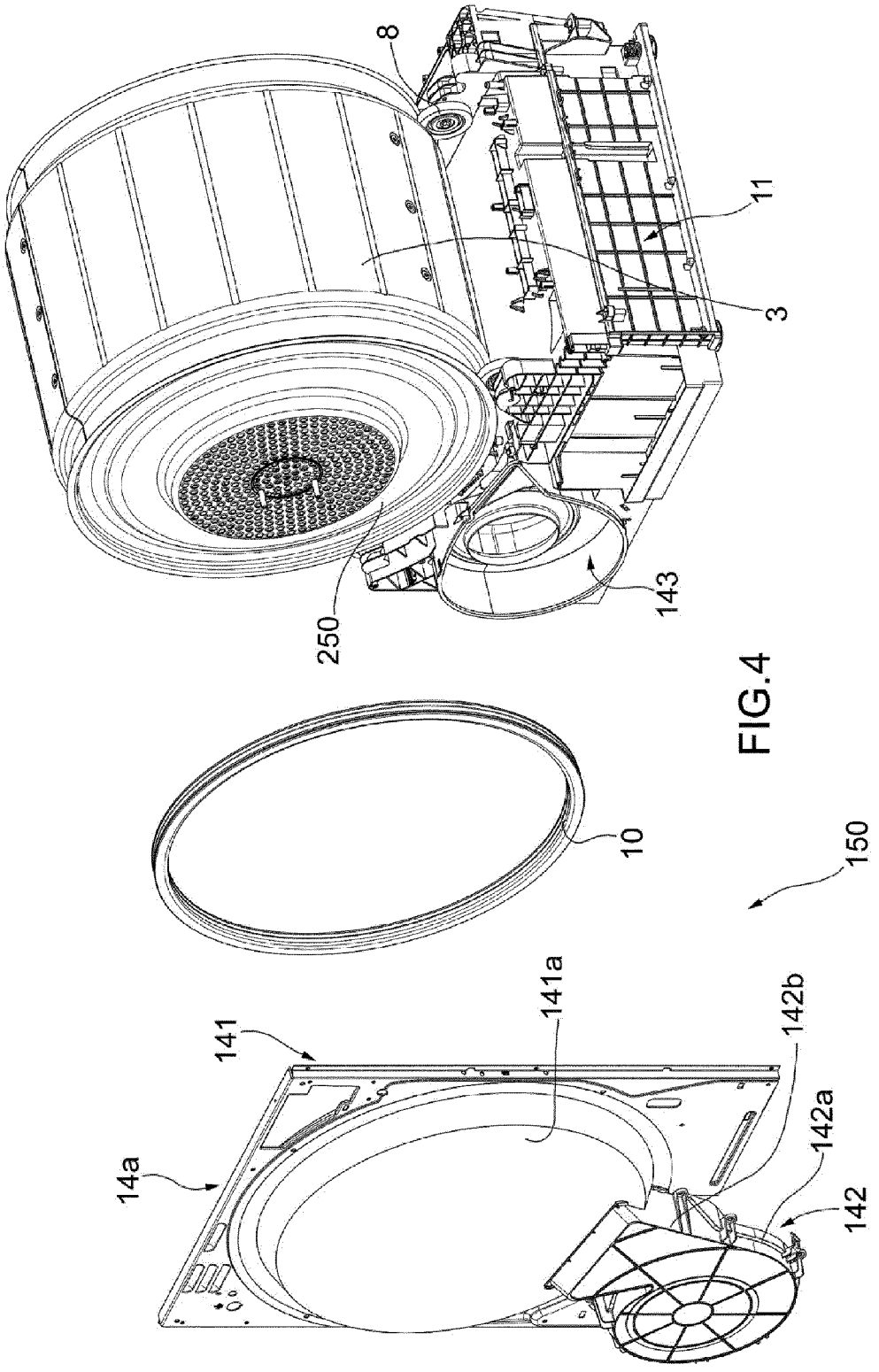


FIG.4

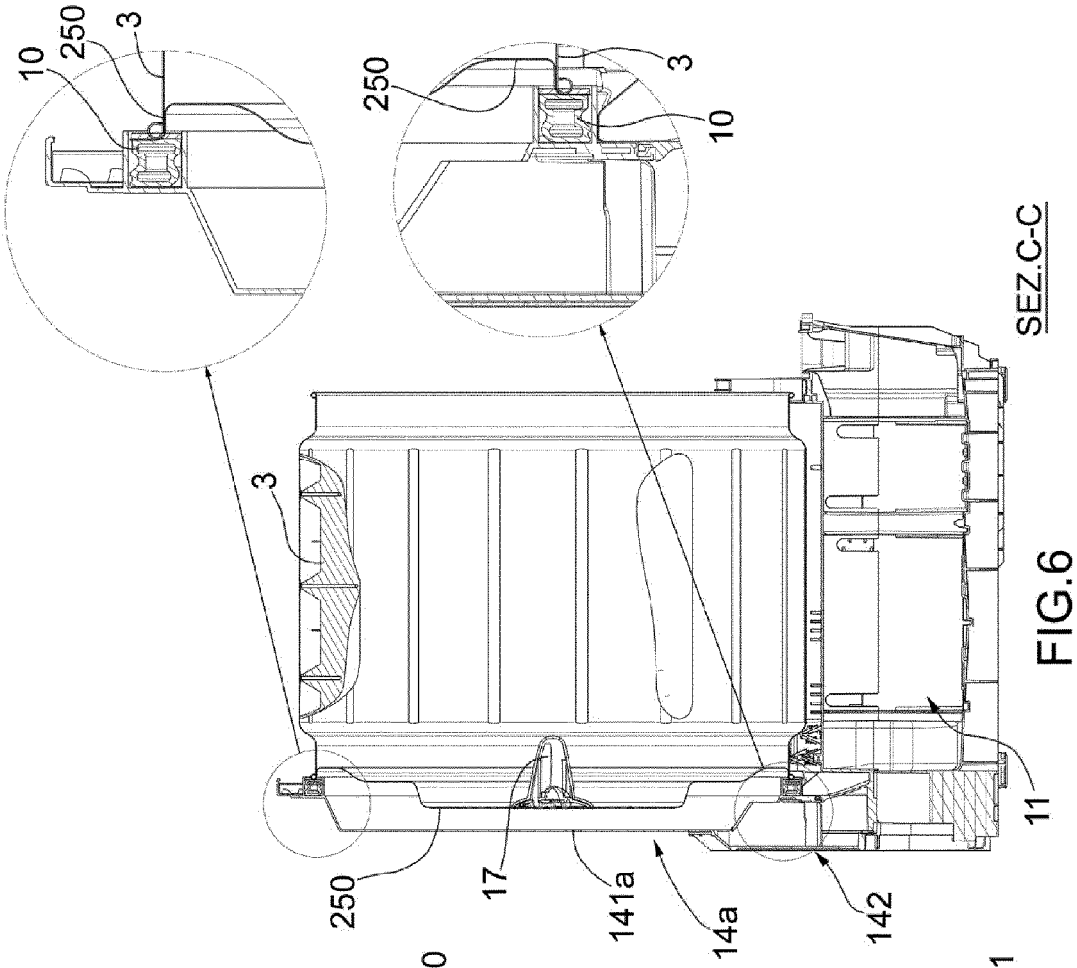


FIG.6

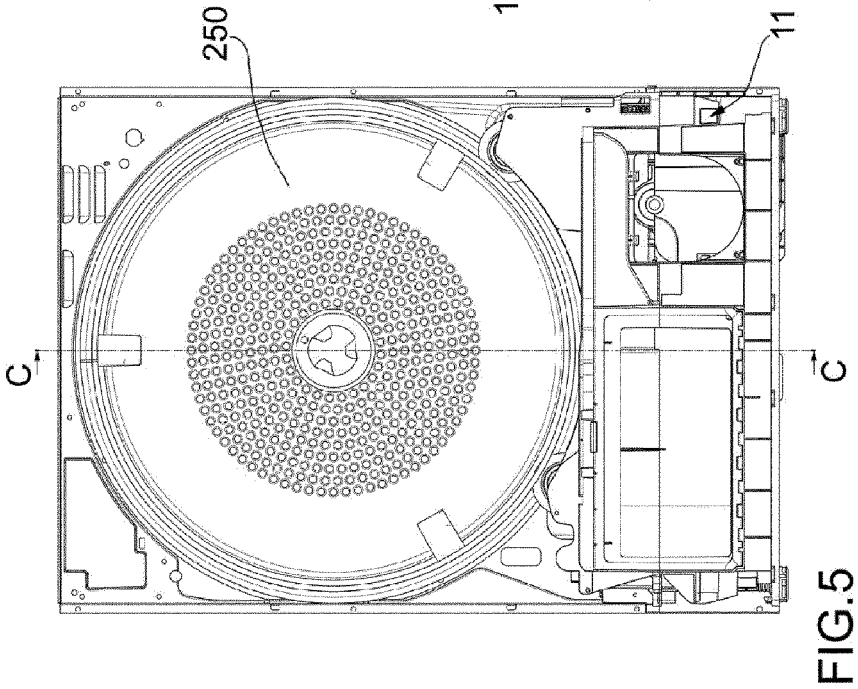


FIG.5

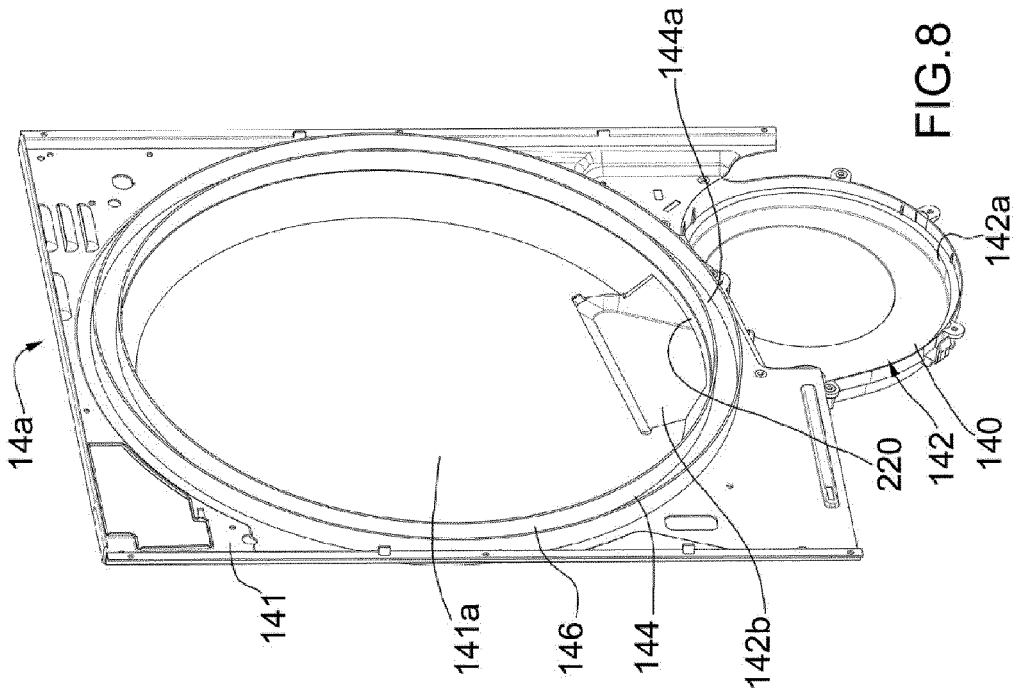
144a
142a
14a
220
142
140
141
141a
146
144
142b

FIG.8

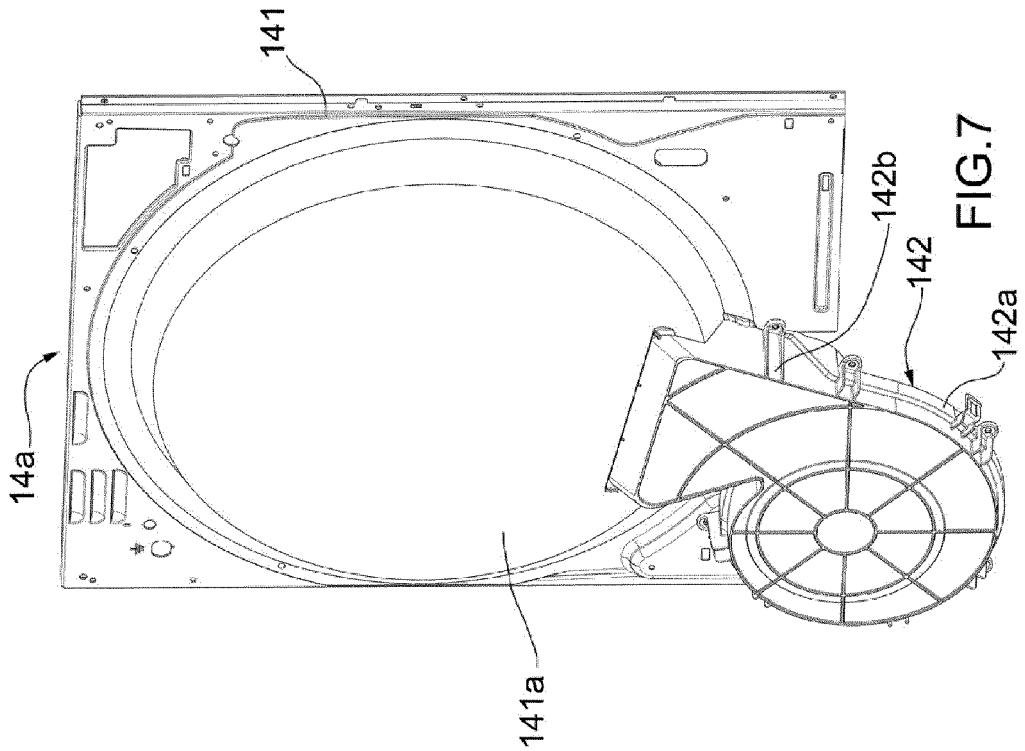
141
142b
142
142a
14a
141a

FIG.7

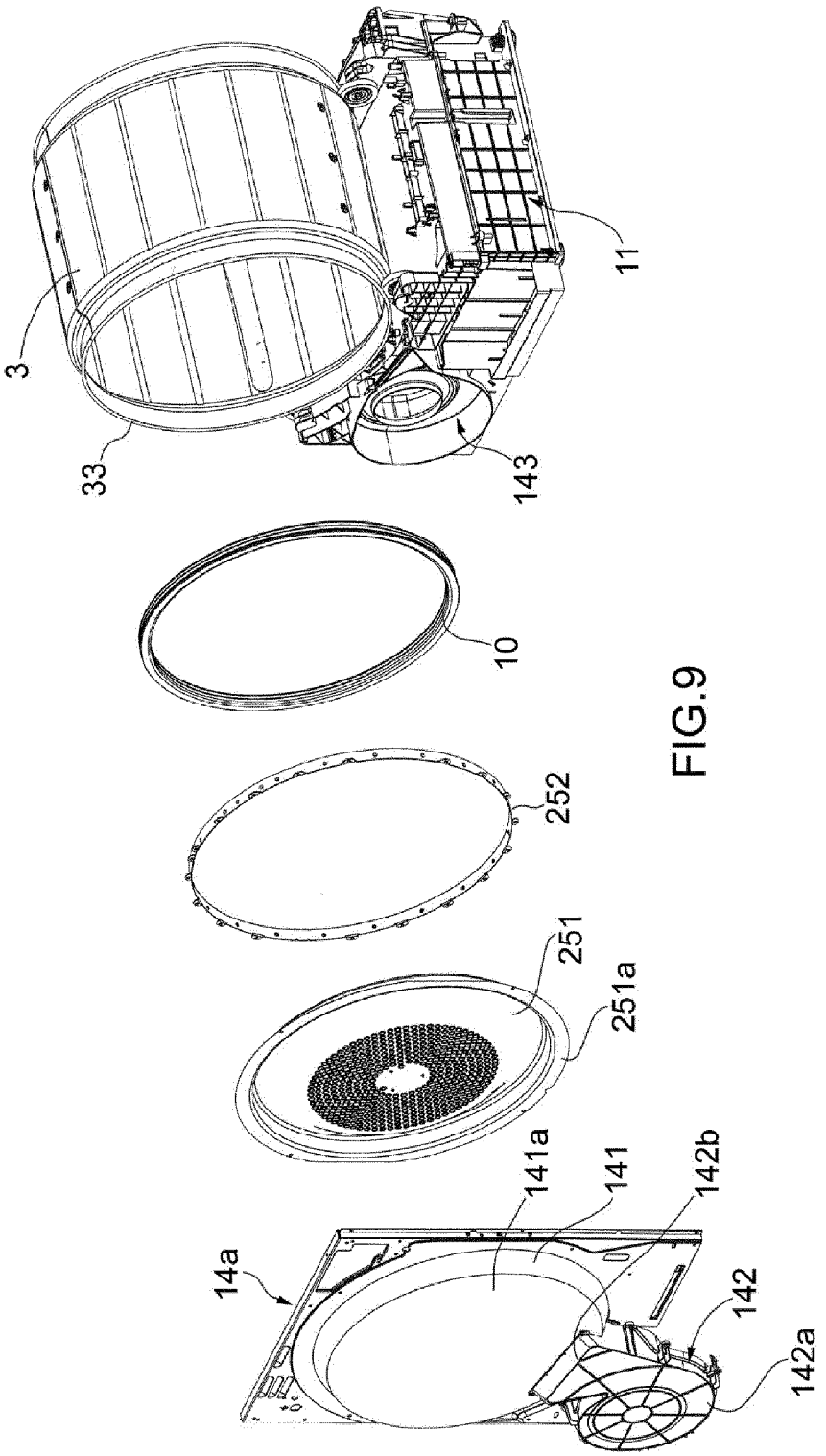


FIG.9

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# EUROPEAN SEARCH REPORT

Application Number
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## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| E | EP 2 631 353 A1 (ELECTROLUX HOME PROD CORP [BE]) 28 August 2013 (2013-08-28)<br>* paragraphs [0010] - [0084] *<br>* claims 1-15; figures 1-5 * | 1-4,9, 11-13 | INV.<br>D06F58/06<br>D06F58/04<br>D06F58/20 |
| A | EP 2 423 375 A1 (ELECTROLUX HOME PROD CORP [BE]) 29 February 2012 (2012-02-29)<br>* paragraphs [0032] - [0076] *<br>* figures 1-7 * | 1-15 | |
| A | EP 2 527 523 A1 (ELECTROLUX HOME PROD CORP [BE]) 28 November 2012 (2012-11-28)<br>* paragraphs [0008] - [0018], [0023] *<br>* paragraphs [0052] - [0074] *<br>* figures 1-6 * | 1-4, 11-15 | |
| A | DE 10 2005 013053 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE])<br>30 November 2006 (2006-11-30)<br>* claims 1-12; figures 1-3 *<br>* paragraphs [0018] - [0026] * | 1,3,4, 14,15 | TECHNICAL FIELDS SEARCHED (IPC) |
| A | WO 2011/080121 A1 (ARCELIK AS [TR]; BATUR ALPER [TR]; CINAR LEVENT [TR]; ERTAS FIRDEVS BA) 7 July 2011 (2011-07-07)<br>* paragraphs [0028] - [0033] *<br>* figures 1-9 * | 1,3,4,15 | D06F |
| A | WO 2011/080114 A1 (ARCELIK AS [TR]; GULBAY UMIT [TR]; CINAR LEVENT [TR]; CAN REMZI [TR]) 7 July 2011 (2011-07-07)<br>* abstract; claims 1-5; figures 2-7 * | 1,15 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 7 February 2014 | Weinberg, Ekkehard |

CATEGORY OF CITED DOCUMENTS

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07-02-2014

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| EP 2631353 A1 | 28-08-2013 | EP 2631353 A1 | 28-08-2013 |
| | | WO 2013127742 A1 | 06-09-2013 |
| EP 2423375 A1 | 29-02-2012 | CN 102373611 A | 14-03-2012 |
| | | EP 2423375 A1 | 29-02-2012 |
| | | RU 2011135242 A | 10-03-2013 |
| | | US 2012047759 A1 | 01-03-2012 |
| EP 2527523 A1 | 28-11-2012 | NONE | |
| DE 102005013053 A1 | 30-11-2006 | AT 414194 T | 15-11-2008 |
| | | DE 102005013053 A1 | 30-11-2006 |
| | | EP 1888834 A1 | 20-02-2008 |
| | | US 2009126218 A1 | 21-05-2009 |
| | | WO 2006125682 A1 | 30-11-2006 |
| WO 2011080121 A1 | 07-07-2011 | EP 2519683 A1 | 07-11-2012 |
| | | WO 2011080121 A1 | 07-07-2011 |
| WO 2011080114 A1 | 07-07-2011 | EP 2519682 A1 | 07-11-2012 |
| | | WO 2011080114 A1 | 07-07-2011 |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82