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

(57) Rotary-drum laundry dryer (1) comprising an outer casing (2) structured for resting on the floor, a substantially cylindrical, sleeve-shaped revolving drum (3) which is structured for housing the laundry to be dried and is fixed in axially rotating manner inside the casing (2) with the drum rear rim (3r) in abutment on a rear wall (2b) of said casing (2), and an anti-entangling nose (20) which protrudes from the rear wall (2b) of the casing (2) inside the revolving drum (3) and is shaped/dimensioned so as to prevent, when said drum (3) rotates, the damp laundry located into the revolving drum (3) from entangling on the inner surface of the casing rear wall (2b); said anti-entangling nose (20) in turn comprising a supporting socket (21) which is structured for resting in abutment on the rear wall (2b) of the casing (2), and an oblong member (22) that sticks out from the supporting socket (21) inside the revolving drum (3) and is dimensioned/shaped so as to prevent the damp laundry located into the drum (3) from entangling on the inner surface of the casing rear wall (2b) when the drum (3) rotates; the rear wall (2b) of the casing (2) comprising an inner section (17) and an outer section (16) that form/delimit in between themselves an inner cavity (11) which is fluidly connected to the inside of the revolving drum (3); said supporting socket (21) being furthermore structured for resting in abutment on the inner section (17) of the rear wall (2b), immediately above said inner cavity (11), and being shaped/ dimensioned so as to also engage in pass-through manner the inner section (17) of the rear wall (2b) and then extend across the inner cavity (11) of the rear wall (2b) to abut on the outer section (16) of the rear wall (2b) of said casing (2).

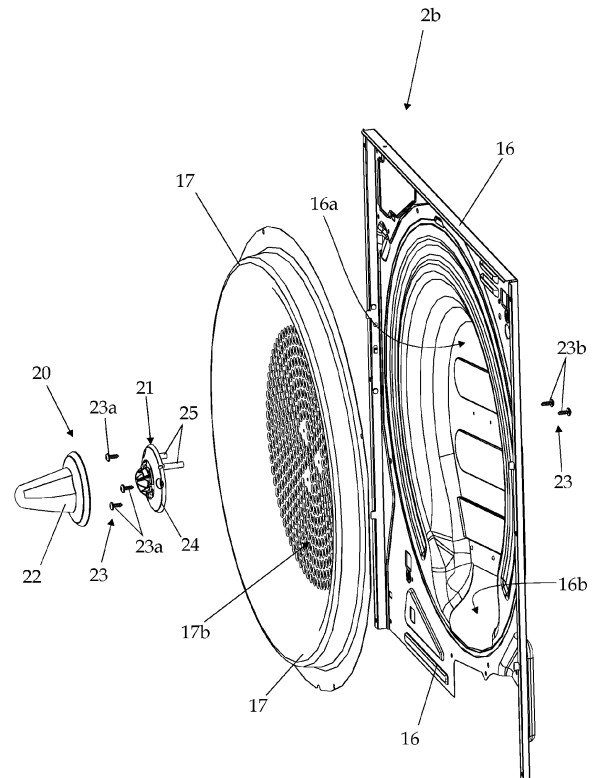


Fig. 3

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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, boxlike outer casing structured for resting on the floor; a substantially cylindrical revolving drum which is structured for housing the laundry to be dried and is housed in axially rotating manner inside the casing 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 revolving drum; an electrically-powered motor assembly which is housed inside the casing and is structured for driving into rotation the revolving 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 revolving drum a stream of hot air which has a very low moisture content and flows through the revolving 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] Furthermore, in most of the rotary-drum home laundry dryers currently on the market the revolving drum consists in a substantially cylindrical, rigid tubular body which extends substantially horizontally inside the appliance casing 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 fixed 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 substantially airtight and axially rotating manner to the front wall of the appliance boxlike casing; whereas the rear rim of the tubular body abuts against the rear wall of the boxlike casing and is coupled in substantially airtight and axially rotating manner directly to said rear wall.

[0006] Since the back of the revolving drum consists in the rear wall of the casing and remains stationary during rotation of the tubular body, most of the laundry dryers referred above are also provided with an anti-entangling nose that protrudes from the rear wall of the appliance

casing 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 on the rear wall of the casing and block the hot-air intake vent located on said wall.

[0007] Despite allowing a more efficient and quicker drying of the damp laundry inside the drum, the anti-entangling nose may cause local deformations of the metal sheet forming the rear wall of the appliance casing that, in turn, may occasionally reduce the clear section of the hot-air intake vent, with all problems concerned.

[0008] At beginning of the drying cycle, in fact, the damp laundry usually tends to wrap around the anti-entangling nose up to the tip, thus generating a flexional moment that tends to bend downwards the nose. The body of the anti-entangling nose is however considerably rigid, thus the flexional moment usually stresses the portion of the rear wall directly supporting the base of the nose and, if the laundry twisted around the nose is particularly moist and heavy, it may be so high to locally permanently deform the metal sheet forming the rear wall of the appliance casing.

[0009] To avoid this problem, when the anti-entangling nose is to be installed in the laundry dryer, a thicker-than-usual metal sheet is used to realize the rear wall of the appliance casing with the consequent rise of the overall production costs.

[0010] Aim of the present invention is to avoid the increase of the overall production costs correlated to the use of the anti-entangling nose in the rotary-drum home laundry dryer.

[0011] In compliance with the above aims, according to the present invention there is provided a rotary-drum laundry dryer comprising an outer casing structured for resting on the floor, a substantially cylindrical, sleeve-shaped revolving drum which is structured for housing the laundry to be dried and is fixed in axially rotating manner inside the casing with the drum rear rim in abutment on a rear wall of said casing, and an anti-entangling nose which protrudes from the rear wall of the casing inside the revolving drum and is shaped/dimensioned so as to prevent, when said drum rotates, the entangling of the damp laundry located into the revolving drum; said anti-entangling nose in turn comprising a supporting socket which is structured for resting in abutment on the rear wall of the casing, and an oblong member that sticks out from the supporting socket inside the revolving drum and is dimensioned/shaped so as to prevent the damp laundry located into the drum from entangling on the inner surface of the casing rear wall when the drum rotates; the rotary-drum laundry dryer being characterized in that the rear wall of the casing comprises an inner section and an outer section that form/delimit in between themselves an inner cavity which is fluidly connected to the inside of the revolving drum; and in that said supporting socket is structured for resting in abutment on the inner

section of the rear wall, and is furthermore shaped/dimensioned so as to also engage in pass-through manner the inner section of the rear wall and then extend across the inner cavity of the rear wall up to abut on the outer section of the rear wall of said casing.

[0012] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that said anti-entangling nose furthermore comprises anchoring means structured for firmly and rigidly fixing the supporting socket in abutment on the rear wall the casing.

[0013] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that said anchoring means) comprise one or more first anchoring elements structured for firmly and rigidly fixing the supporting socket in abutment on the inner section of the rear wall of the casing.

[0014] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that said anchoring means comprise one or more second anchoring elements structured for firmly and rigidly fixing the supporting socket in abutment on the outer section of the rear wall of the casing.

[0015] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that the supporting socket comprises a main coupling plate which is structured for resting in abutment on the inner section of the rear wall of the casing, and one or more leg appendixes that protrude from the coupling plate towards the rear wall so as to engage in pass-through manner the inner section of the rear wall, and then extend across the inner cavity of the rear wall to abut directly on the outer section of the rear wall.

[0016] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that each leg appendix consists in a rigid straight stem that protrudes from the coupling plate perpendicular to the reference laying plane of the coupling plate and/or of the rear wall, engages in pass-through manner the inner section of the rear wall, and extends across the inner cavity of the rear wall up to reach and abut directly on the outer section of the rear wall.

[0017] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that the revolving drum extends coaxial to a longitudinal reference axis and the rigid straight stem extends across the inner cavity of the rear wall remaining locally substantially parallel to said longitudinal reference axis.

[0018] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that the rigid straight stem is misaligned to the drum longitudinal reference axis.

[0019] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that aid first anchoring elements comprise anchoring screws, rivets or other fixing devices which engage in pass-through manner the main coupling plate and the inner section of the rear wall, to firmly and rigidly fix the main coupling plate in abutment on the inner section of

the rear wall.

[0020] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that said second anchoring elements comprise anchoring screws, rivets or other fixing devices which engage in pass-through manner the outer section of the rear wall and then extends into the tips of the leg appendixes to firmly and rigidly fix each leg appendix in abutment on the outer section of the rear wall of the casing.

[0021] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that the rear wall of the casing comprises a substantially vertically-oriented, main bulkhead which is provided with a sink-shaped bulge or recess that projects outwards of the casing, and a complementary lid or cover which is firmly fixed to the main bulkhead and is shaped/dimensioned so as to completely cover and close the outwards-projecting bulge or recess on the main bulkhead to form the inner cavity of the rear wall; at least a portion of said complementary lid or cover being furthermore structured to be permeable to air, so as to permit free air circulation between the inner cavity and the inside of the revolving drum.

[0022] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized by additionally comprising a hot-air generator which is structured to circulate through the revolving drum a stream of hot air having a low moisture level, and which flows over and rapidly dries the laundry located inside the drum; the inner cavity on the rear wall of the casing being fluidly connected to the hot-air generator so that said stream of hot air is obliged to flow into or out of the revolving drum through said inner cavity.

[0023] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that the hot-air generator is a closed-circuit, hot-air generator and comprises:

- an air recirculating conduit having its two ends fluidly connected to the revolving drum on opposite sides of the latter;
- air circulating means which are located along the air recirculating conduit to produce, inside the latter, an airflow which flows in closed loop through the air recirculating conduit and the revolving drum;
- air cooling means which are located along the air recirculating conduit and are structured to rapidly cool the moist air arriving from revolving drum so as to cause the condensation of the surplus moisture inside the airflow; and
- air heating means which are located along the air recirculating conduit, downstream of the air cooling means, and are structured for rapidly heating the dehumidified airflow arriving from the air cooling means and directed back to the revolving drum.

[0024] Preferably, though not necessarily, the rotary-drum laundry dryer is furthermore characterized in that

one of the two ends of the air recirculating conduit directly communicates with the inner cavity on the rear wall of the casing.

[0025] A non-limiting embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

- Figure 1 is a perspective view, with parts removed for clarity, of a rotary-drum home laundry dryer realized in accordance with the teachings of the present invention;
- Figure 2 is a section view of the Figure 1 laundry dryer with parts removed for clarity;
- Figure 3 is a partly-exploded, perspective view of the rear wall of the Figure 1 laundry dryer with parts removed for clarity;
- Figure 4 is an enlarged view, with parts in section and parts removed for clarity, of the central portion of the rear wall of the Figure 1 laundry dryer; whereas
- Figure 5 is a partly-exploded, perspective view of the Figure 4 anti-entangling nose fixed on the rear wall of the Figure 1 laundry dryer.

[0026] With reference to Figures 1 and 2, referral number 1 indicates as a whole a rotary-drum home laundry dryer which comprises: a preferably, though not necessarily, parallelepiped-shaped, boxlike outer casing 2 structured for resting on the floor; a substantially cylindrical, sleeve-shaped revolving drum 3 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 in the 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 revolving drum 3.

[0027] Inside the boxlike casing 2, the laundry dryer 1 additionally comprises an electrically-powered motor assembly (not shown) structured for driving into rotation the revolving drum 3 about its longitudinal reference axis; an open-circuit or closed-circuit, hot-air generator 6 which is structured to circulate through the revolving drum 3 a stream of hot air having a low moisture level, and which flows over and rapidly dries the laundry located inside the drum 3; and finally an electronic central control unit (not shown) which controls both the electrically-powered 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.

[0028] With reference to Figure 2, the revolving drum 3 in particular consists in a substantially cylindrical-shaped, rigid tubular body 3 which extends inside the boxlike casing 2 coaxial to a substantially horizontally-oriented, longitudinal reference axis L while remaining

locally substantially aligned to the laundry loading/ unloading opening on the front wall 2a of casing 2, and is preferably structured for resting on a number of idle supporting rollers 8 which are arranged approximately at the two axial ends of tubular body 3 locally substantially parallel to reference axis L, and are fitted/ fixed to the boxlike casing 2 in free revolving manner so as to allow the tubular body 3 to freely rotate about its longitudinal reference axis L inside the boxlike casing 2.

[0029] The front rim 3f of tubular body 3 surrounds the laundry loading/unloading opening realized on front wall 2a of casing 2 and is coupled in substantially airtight and axially rotating manner to front wall 2a preferably with the interposition of a first annular sealing gasket 9; whereas the rear rim 3r of tubular body 3 abuts against the rear wall 2b of casing 2 and is coupled in substantially airtight and axially rotating manner directly to rear wall 2b preferably with the interposition of a second annular sealing gasket 10.

[0030] With reference to Figure 2, the stream of hot air produced by hot-air generator 6 enters into tubular body 3 via an intake air-vent preferably realized in the rear wall 2b of casing 2, within the perimeter of the rear rim 3r of tubular body 3, flows inside tubular body 3 for the entire length of the latter, and comes out of tubular body 3 via an escape air-vent preferably realized on an annular frame delimiting the laundry loading/unloading opening on front wall 2a.

[0031] In the example shown the rear wall 2b of outer casing 2 comprises an inner section and an outer section that form/delimit in between themselves an inner cavity 11 which is arranged inside the wall body so as to be located at least partly adjacent to the rear rim 3r of tubular body 3. This inner cavity 11 is furthermore connected to the hot-air generator 6 and to the inside of tubular body 3 so that the stream of hot air circulating inside the revolving drum 3 is obliged to flow into, or flow out of, the revolving drum 3 through said inner cavity 11.

[0032] In the example shown, in particular, the hot-air generator 6 is preferably a closed-circuit, hot-air generator which is structured for gradually drawing air from revolving drum 3; cooling down the air arriving from revolving drum 3 so to extract and retain the surplus moisture in the air drawn from revolving drum 3; heating the dehumidified air to a predetermined temperature normally higher than the temperature of the air drawn out from revolving drum 3; and feeding the heated, dehumidified air back into the revolving drum 3, where it flows over, the laundry inside the drum to rapidly dry said laundry.

[0033] In other words, with reference to Figure 2, hot-air generator 6 provides for continually dehumidifying and heating the air circulating inside revolving drum 3 to rapidly dry the laundry located inside the drum 3, and basically comprises:

- an air recirculating conduit 12 having its two ends fluidly connected to the revolving drum 3 on opposite sides of the latter;

- an electrically-powered centrifugal fan (not shown) or other type of air circulating pump, which is located along the air recirculating conduit 12 to produce, inside the latter, an airflow *f* which flows in closed loop through the air recirculating conduit 12 and the revolving drum 3;
- air cooling means 14 which are located along the air recirculating conduit 12 preferably, though not necessarily, downstream of the aforesaid air centrifugal fan, and are structured to rapidly cool the moist air arriving from revolving drum 3 so as to cause the condensation of the surplus moisture inside the airflow *f*; and
- air heating means 15 which are located along the air recirculating conduit 12, downstream of the air cooling means 14, and which are structured for rapidly heating the dehumidified airflow *f* arriving from the air cooling means 14 and directed back to revolving drum 3, so that the airflow *f* directed back into revolving drum 3 is heated to a temperature preferably, though not necessarily, higher than or equal to that of the moist air flowing out of revolving drum 3.

[0034] One of the two ends of the air recirculating conduit 12 directly communicates with, i.e. is fluidly connected to, the inner cavity 11 of rear wall 2b, whereas the other end of the air recirculating conduit 12 is fluidly connected to the front rim 3f of tubular body 3, so that the airflow *f* flowing through the air recirculating conduit 12 is obliged to circulate in sequence through inner cavity 11 and tubular body 3 or vice versa.

[0035] In the example shown, in particular, hot-air generator 6 is preferably provided with a heat-pump assembly that comprises a first air/refrigerant heat exchanger, traditionally referred to as the "evaporator" of the heat-pump circuit, which is located inside the air recirculating conduit 12, preferably downstream of the centrifugal fan, and is structured to remove/absorb heat from the airflow arriving from revolving drum 3 thus forming the air cooling means 14 of hot-air generator 6; and a second air/refrigerant heat exchanger, traditionally referred to as the "condenser" of the heat-pump circuit, which is located inside the air recirculating conduit 12, 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 15 of hot-air generator 6.

[0036] As an alternative, the air heating means 15 of hot-air generator 6 may comprise a resistor located inside the air recirculating conduit 12, preferably downstream of the centrifugal fan, whereas the air cooling means 14 of hot-air generator 6 may comprise an air/air heat exchanger that uses the external air to cool down the airflow arriving from revolving drum 3.

[0037] With reference to Figures 2 and 3, in the example shown, in particular, the rear wall 2b of casing 2 preferably comprises a substantially flat, vertically-oriented main bulkhead 16 which is provided with a substantially

circular, sink-shaped bulge or recess 16a which projects outwards casing 2 while remaining substantially coaxial to the longitudinal axis L of tubular body 3, has an outer diameter preferably lower than that of sealing gasket 10 and of rear rim 3r of tubular body 3, so as to be located inside the perimeter of the rear rim 3r of tubular body 3, and directly communicates with the air recirculating conduit 12 via a pass-through opening 16b realized roughly on the bottom of the bulge or recess 16a.

[0038] In addition to the above, the rear wall 2b of outer casing 2 also comprises a substantially circular-shaped, complementary lid or cover 17 which is firmly fixed in airtight manner to the main bulkhead 16 substantially coaxial to the longitudinal axis L of tubular body 3, and is properly shaped/dimensioned so as to completely cover and close the outwards-projecting bulge or recess 16a of bulkhead 16 so to form, at the end of air recirculating conduit 12, a substantially circular-shaped inner cavity 11 which is substantially coaxial to the longitudinal reference axis L of tubular body 3 and is suited to receive the airflow *f* coming out of the air recirculating conduit 12. At least a portion of the complementary lid or cover 17 is furthermore properly perforated, or structured to be permeable to air, so as to permit the hot air arriving from the air recirculating conduit 12 to freely flow into revolving drum 3 or vice versa.

[0039] The main bulkhead 16 and the complementary lid or cover 17 therefore form, respectively, the outer and inner section of the rear wall 2b of boxlike casing 2 that delimit in between themselves the inner cavity 11 suited to receive the airflow *f* flowing through the air recirculating conduit 12.

[0040] With reference to Figures 2 and 3, in the example shown, in particular, complementary lid or cover 17 is preferably substantially dish- or basin-shaped and is firmly fixed to main bulkhead 16 in a substantially airtight manner, preferably with its concavity directly facing the bottom of the outwards-projecting bulge or recess 16a of bulkhead 16, so as to form, inside the rear wall 2b, a substantially lenticular-shaped inner cavity 11 which is suited to receive the hot air arriving from the air recirculating conduit 12 of hot-air generator 6. At least a portion of the bottom 17b of said substantially dish- or basin-shaped lid or cover 17 is furthermore properly perforated, or at any rate permeable to air, so as to permit the hot air arriving from the air recirculating conduit 12 to freely flow into revolving drum 3 or vice versa.

[0041] In the example shown the nominal outer diameter of the dish- or basin-shaped lid or cover 17 is preferably greater than that of rear rim 3r of tubular body 3 and of annular sealing gasket 10, and the annular sealing gasket 10 is preferably fixed to the annular peripheral border of the basin-shaped lid or cover 17 so as to completely encircle the bottom 17b of the basin-shaped lid or cover 17 and its perforated, or at any rate permeable to air, central portion.

[0042] Furthermore, with reference to Figure 3, in the example shown the perforated, or at any rate permeable

to air, portion of the bottom 17b of the basin-shaped lid or cover 17 is preferably substantially circular in shape and is arranged substantially coaxial to the longitudinal reference axis L of tubular body 3.

[0043] With reference to Figures 2 and 3, the rotary-drum home laundry dryer 1 moreover comprises a laundry anti-entangling nose 20 which protrudes from the rear wall 2b of boxlike casing 2 inside the tubular body 3, and is properly shaped/ dimensioned so as to prevent, when tubular body 3 rotates, the damp laundry from entangling inside the drum 3.

[0044] The anti-entangling nose 20 is fixed to the rear wall 2b of boxlike casing 2, immediately above the inner cavity 11 of rear wall 2b, and extends inside tubular body 3 preferably remaining locally substantially parallel or even coaxial to the longitudinal reference axis L of tubular body 3.

[0045] With reference to Figures 3, 4 and 5, in particular, the anti-entangling nose 20 basically comprises: a supporting socket 21 which is structured for resting in abutment on the inner section of rear wall 2b, i.e. on the substantially dish- or basin-shaped lid or cover 17, immediately above/aligned to the inner cavity 11 of rear wall 2b; a preferably, though not necessarily, substantially frustoconical-shaped, oblong member 22 that sticks out from supporting socket 21 inside tubular body 3, and is properly dimensioned/shaped so as to prevent the damp laundry located into the revolving drum 3 from entangling on the inner surface of the rear wall 2b when tubular body 3 rotates; and anchoring means 23 structured for firmly and rigidly fixing the supporting socket 21 in abutment on the inner section of rear wall 2b of boxlike casing 2, i.e. on the bottom 17b of complementary lid or cover 17.

[0046] In addition to the above, the supporting socket 21 is furthermore structured/ dimensioned so as to also engage in pass-through manner the inner section of rear wall 2b, i.e. the bottom 17b of the substantially dish- or basin-shaped lid or cover 17, and then extend across the inner cavity 11 of rear wall 2b up to reach and abut directly on the outer section of the rear wall 2b of boxlike casing 2, i.e. on the main bulkhead 16.

[0047] In other words, the inner section 17 of rear wall 2b has an inner side or face directly faced to the inside of tubular body 3, and an outer side or face directly faced to the inner cavity 11 of rear wall 2b. The outer section 16 of rear wall 2b instead has an inner side or face directly faced to the inner cavity 11 of rear wall 2b, and an outer side or face faced to the outside of boxlike casing 2, and the supporting socket 21 of the anti-entangling nose 20 is structured to abut on the inner side or face of the inner section 17 and on the inner side or face of outer section 16.

[0048] The anchoring means 23, in turn, preferably comprise one or more anchoring screws 23a, rivets or other fixing elements structured for firmly and rigidly fixing the supporting socket 21 in abutment on the inner section of rear wall 2b, i.e. on the bottom 17b of the dish- or basin-

shaped lid or cover 17.

[0049] Preferably, though not necessarily, the anchoring devices 23 furthermore comprise one or more anchoring screws 23b, rivets or other fixing elements structured for firmly and rigidly fixing the supporting socket 21 in abutment on the outer section of rear wall 2b, i.e. on the main bulkhead 16, so as to rigidly connect the inner and outer sections of rear wall 2b to one another.

[0050] With reference to Figures 3, 4 and 5, in the example shown, in particular, the supporting socket 21 preferably comprises a main coupling plate 24 which is structured for resting in abutment on the inner section of rear wall 2b, i.e. on the bottom 17b of the substantially dish- or basin-shaped lid or cover 17, and one or more leg appendixes 25 that protrude from the coupling plate 24 towards the rear wall 2b, so as to engage in pass-through manner the inner section of rear wall 2b, i.e. the bottom 17b of the substantially dish- or basin-shaped lid or cover 17, and then extend across the inner cavity 11 of rear wall 2b up to reach and abut directly on the outer section of rear wall 2b, i.e. on the main bulkhead 16.

[0051] In the example shown the coupling plate 24 is preferably substantially circular-shaped, whereas each leg appendix 25 is preferably misaligned to the drum longitudinal reference axis L, and preferably consists in a rigid straight stem 25 that protrudes from the coupling plate 24 remaining locally substantially perpendicular to the reference laying plane of coupling plate 24 and/or of rear wall 2b, engages in pass-through manner the inner section of rear wall 2b, i.e. the bottom 17b of the substantially dish- or basin-shaped lid or cover 17, and finally extends across the inner cavity 11 of rear wall 2b remaining locally substantially parallel to the longitudinal reference axis L of tubular body 3 up to reach and abut directly on the outer section of rear wall 2b, i.e. on the main bulkhead 16.

[0052] In the example shown, the rigid straight stems 25 are preferably, though not necessarily, substantially coplanar to one another and preferably, though not necessarily, realized in one piece with the coupling plate 24.

[0053] As regards the anchoring means 23, a first number of anchoring screws 23a, rivets or other fixing elements/devices engages in pass-through manner the main coupling plate 24 and the inner section of rear wall 2b, i.e. the bottom 17b of the substantially dish- or basin-shaped lid or cover 17, to firmly and rigidly fix the main coupling plate 24 in abutment on the inner section of rear wall 2b. A second number of anchoring screws 23b, rivets or other fixing elements/devices instead engages in pass-through manner the outer section of rear wall 2b, i.e. the main bulkhead 16, and then extends into the tips of the various leg appendixes 25, i.e. the various stems 25, to firmly and rigidly fix each leg appendix 25 in abutment on the outer section of rear wall 2b.

[0054] With reference to Figures 3, 4 and 5, instead, the substantially frustoconical-shaped, oblong member 22 is preferably provided with a substantially cup-shaped, base portion 22a which is structured/dimensioned so as

to be rigidly and stably fitted on the main coupling plate 24 of supporting socket 21.

[0055] In the example shown, in particular, the main coupling plate 24 of supporting socket 21 and the oblong member 22 are preferably provided with snap-on locking means 26 which are structured for selectively firmly connecting the oblong member 22 to the supporting socket 21.

[0056] General operation of the rotary-drum home laundry drier 1 is clearly inferable from the above description, with no further explanation required.

[0057] The advantages connected to the particular structure of the anti-entangling nose 20, and more specifically of the supporting socket 21 of the anti-entangling nose 20, are large in number.

[0058] First of all, being able to rigidly connect one another the inner and outer sections of the rear wall 2b of casing 2, the leg appendixes 25 of the supporting socket 21 increases the flexional strength of the inner section 17 of the rear wall 2b up to easily support the flexional moments caused by an extremely moist laundry wrapped on the anti-entangling nose. Thus there is no more the need to use thicker-than-usual metal sheet to realize the rear wall of the appliance casing.

[0059] Clearly, changes may be made to the rotary-drum home laundry drier 1 as described herein without, however, departing from the scope of the present invention.

[0060] For example, in a less sophisticated non-shown embodiment the oblong member 22 may be realized in one piece with supporting socket 21, or rather in one piece with the main coupling plate 24 of supporting socket 21.

Claims

1. Rotary-drum laundry dryer (1) comprising an outer casing (2) structured for resting on the floor, a substantially cylindrical, sleeve-shaped revolving drum (3) which is structured for housing the laundry to be dried and is fixed in axially rotating manner inside the casing (2) with the drum rear rim (3r) in abutment on a rear wall (2b) of said casing (2), and an anti-entangling nose (20) which protrudes from the rear wall (2b) of the casing (2) inside the revolving drum (3) and is shaped/dimensioned so as to prevent, when said drum (3) rotates, the entangling of the damp laundry located into the revolving drum (3); said anti-entangling nose (20) in turn comprising a supporting socket (21) which is structured for resting in abutment on the rear wall (2b) of the casing (2), and an oblong member (22) that sticks out from the supporting socket (21) inside the revolving drum (3) and is dimensioned/shaped so as to prevent the damp laundry located into the drum (3) from entangling on the inner surface of the casing rear wall (2b) when the drum (3) rotates;

the rotary-drum laundry dryer (1) being **characterized in that** the rear wall (2b) of the casing (2) comprises an inner section (17) and an outer section (16) that form/delimit in between themselves an inner cavity (11) which is fluidly connected to the inside of the revolving drum (3); and **in that** said supporting socket (21) is structured for resting in abutment on the inner section (17) of the rear wall (2b), and is furthermore shaped/dimensioned so as to also engage in pass-through manner the inner section (17) of the rear wall (2b) and then extend across the inner cavity (11) of the rear wall (2b) to abut on the outer section (16) of the rear wall (2b) of said casing (2).

2. Rotary-drum laundry dryer according to Claim 1, **characterized in that** said anti-entangling nose (20) furthermore comprises anchoring means (23) structured for firmly and rigidly fixing the supporting socket (21) in abutment on the rear wall (2b) the casing (2).
3. Rotary-drum laundry dryer according to Claim 2, **characterized in that** said anchoring means (23) comprise one or more first anchoring elements (23a) structured for firmly and rigidly fixing the supporting socket (21) in abutment on the inner section (17) of the rear wall (2b) of the casing (2).
4. Rotary-drum laundry dryer according to Claim 2 or 3, **characterized in that** said anchoring means (23) comprise one or more second anchoring elements (23b) structured for firmly and rigidly fixing the supporting socket (21) in abutment on the outer section (16) of the rear wall (2b) of the casing (2).
5. Rotary-drum laundry dryer according to any one of the foregoing claims, **characterized in that** the supporting socket (21) comprises a main coupling plate (24) which is structured for resting in abutment on the inner section (17) of the rear wall (2b) of the casing (2), and one or more leg appendixes (25) that protrude from the coupling plate (24) towards the rear wall (2b) so as to engage in pass-through manner the inner section (17) of the rear wall (2b), and then extend across the inner cavity (11) of the rear wall (2b) to abut directly on the outer section (16) of the rear wall (2b).
6. Rotary-drum laundry dryer according to Claim 5, **characterized in that** each leg appendix (25) comprises a rigid straight stem (25) that protrudes from the coupling plate (24) perpendicular to the reference laying plane of the coupling plate (24) and/or of the rear wall (2b), engages in pass-through manner the inner section (17) of the rear wall (2b), and extends across the inner cavity (11) of the rear wall (2b) up to reach and abut directly on the outer section (16) of the rear wall (2b).

7. Rotary-drum laundry dryer according to Claim 6, **characterized in that** the revolving drum (3) extends coaxial to a longitudinal reference axis (L) and the rigid straight stem (25) extends across the inner cavity (11) of the rear wall (2b) remaining locally substantially parallel to said longitudinal reference axis (L).
8. Rotary-drum laundry dryer according to Claim 7, **characterized in that** the rigid straight stem (25) is misaligned to the drum longitudinal reference axis (L).
9. Rotary-drum laundry dryer according to any one of Claims 5-8, **characterized in that** said first anchoring elements (23a) comprise anchoring screws, rivets or other fixing devices (23a) which engage in pass-through manner the main coupling plate (24) and the inner section (17) of the rear wall (2b), to firmly and rigidly fix the main coupling plate (24) in abutment on the inner section (17) of the rear wall (2b).
10. Rotary-drum laundry dryer according to any one of Claims 5-9, **characterized in that** said second anchoring elements (23b) comprise anchoring screws, rivets or other fixing devices (23b) which engage in pass-through manner the outer section (16) of the rear wall (2b) and then extends into the tips of the leg appendixes (25) to firmly and rigidly fix each leg appendix (25) in abutment on the outer section (18) of the rear wall (2b) of the casing (2).
11. Rotary-drum laundry dryer according to any one of the foregoing claims, **characterized in that** the rear wall (2b) of the casing (2) comprises a substantially vertically-oriented, main bulkhead (16) which is provided with a sink-shaped bulge or recess (16a) that projects outwards of the casing (2), and a complementary lid or cover (17) which is firmly fixed to the main bulkhead (16) and is shaped/dimensioned so as to completely cover and close the outwards-projecting bulge or recess (16a) on the main bulkhead (16) to form the inner cavity (11) of the rear wall (2b); at least a portion of said complementary lid or cover (17) being furthermore structured to be permeable to air, so as to permit free air circulation between the inner cavity (11) and the inside of the revolving drum (3).
12. Rotary-drum laundry dryer according to any one of the foregoing claims, **characterized by** additionally comprising a hot-air generator (6) which is structured to circulate through the revolving drum (3) a stream of hot air having a low moisture level, and which flows over and rapidly dries the laundry located inside the drum (3); the inner cavity (11) on the rear wall (2b) of the casing (2) being fluidly connected to the hot-air generator (6) so that said stream of hot air is obliged to flow into or out of the revolving drum (3) through said inner cavity (11).
13. Rotary-drum laundry dryer according to Claim 12, **characterized in that** the hot-air generator (6) is a closed-circuit, hot-air generator (6) and comprises:
- an air recirculating conduit (12) having its two ends fluidly connected to the revolving drum (3) on opposite sides of the latter;
 - air circulating means which are located along the air recirculating conduit (12) to produce, inside the latter, an airflow (f) which flows in closed loop through the air recirculating conduit (12) and the revolving drum (3);
 - air cooling means (14) which are located along the air recirculating conduit (12) and are structured to rapidly cool the moist air arriving from revolving drum (3) so as to cause the condensation of the surplus moisture inside the airflow f; and
 - air heating means (15) which are located along the air recirculating conduit (12), downstream of the air cooling means (14), and are structured for rapidly heating the dehumidified airflow (f) arriving from the air cooling means (14) and directed back to the revolving drum (3).
14. Rotary-drum laundry dryer according to Claim 13, **characterized in that** one of the two ends of the air recirculating conduit (12) directly communicates with the inner cavity (11) on the rear wall (2b) of the casing (2).

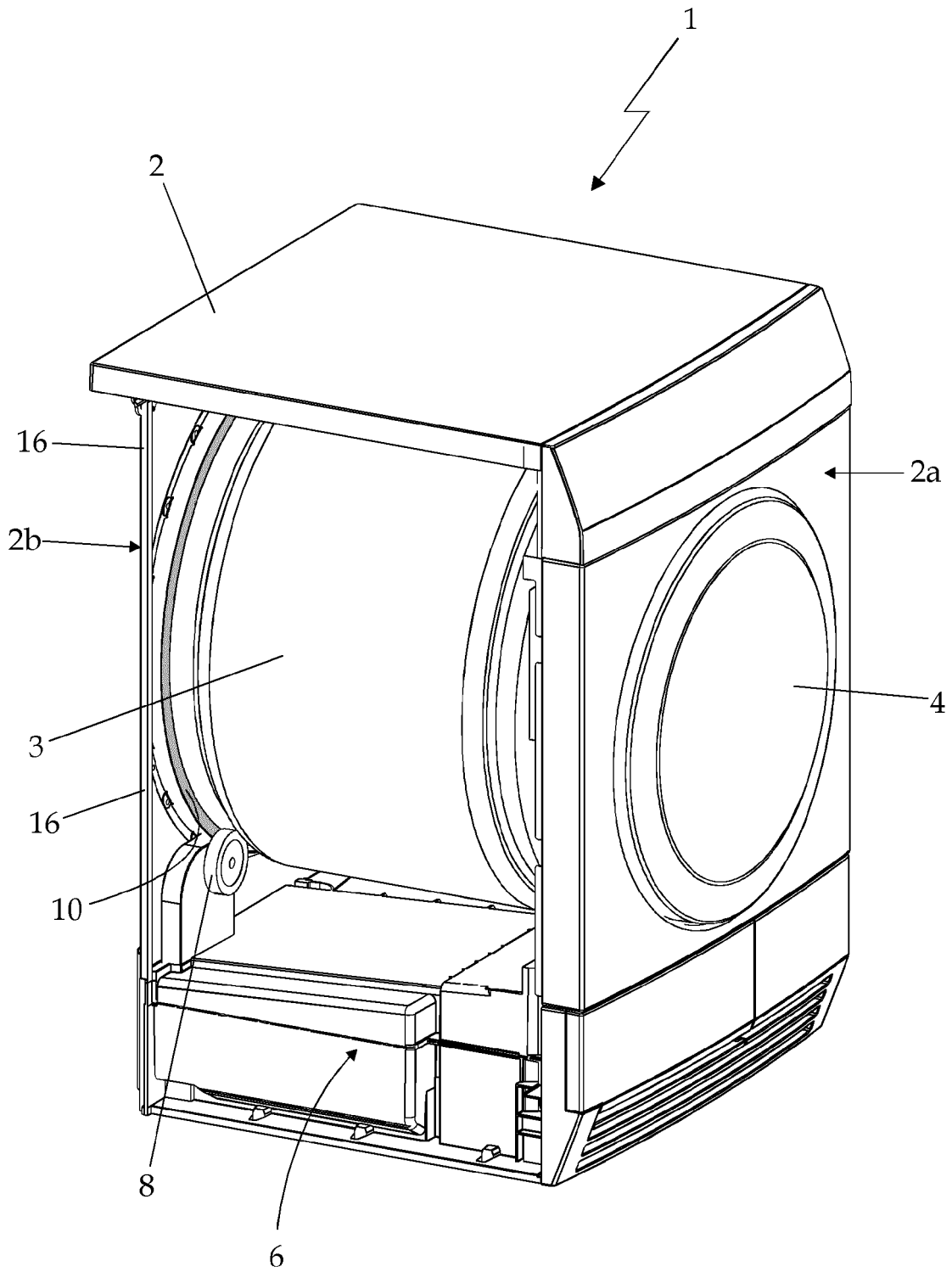


Fig. 1

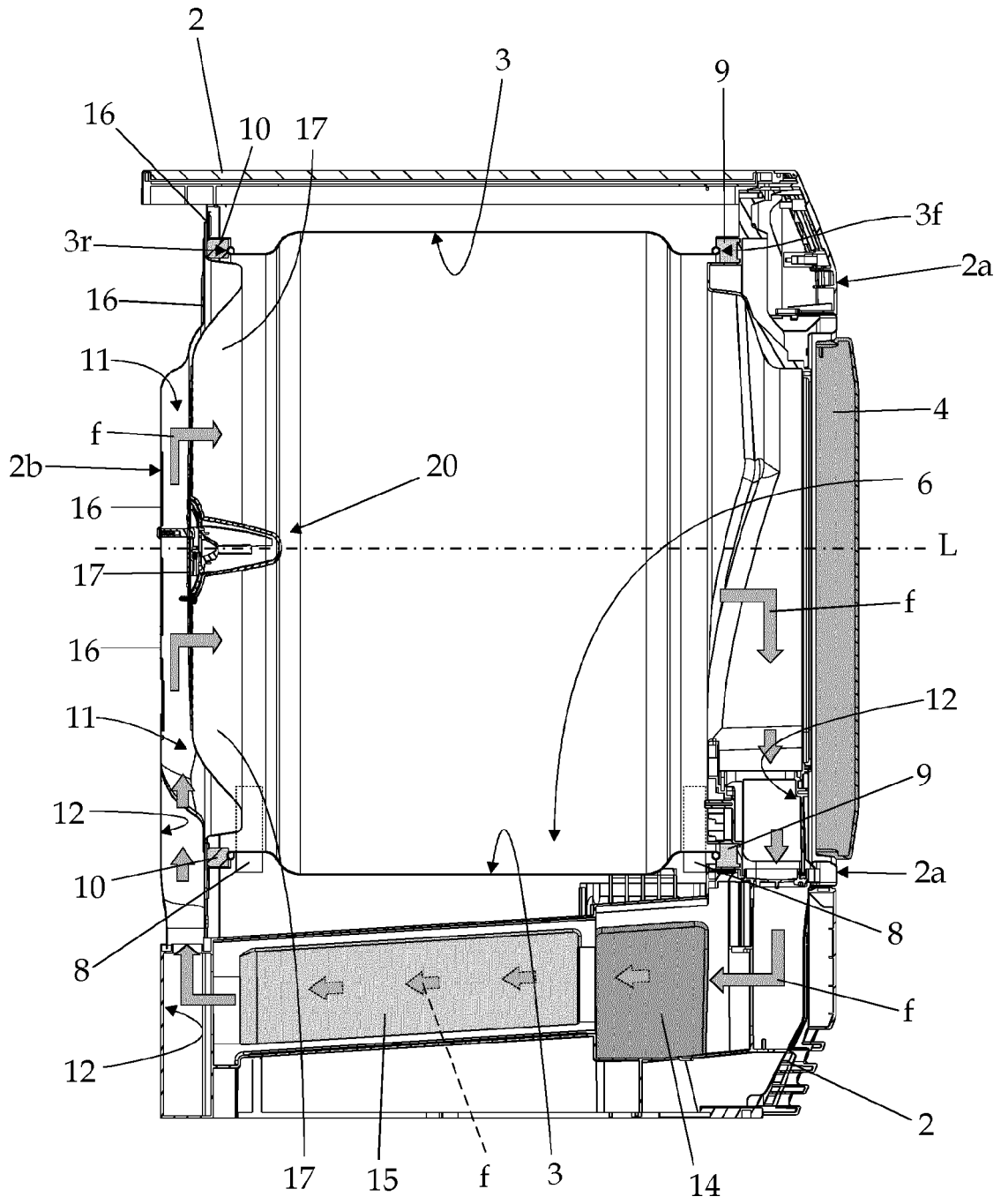


Fig. 2

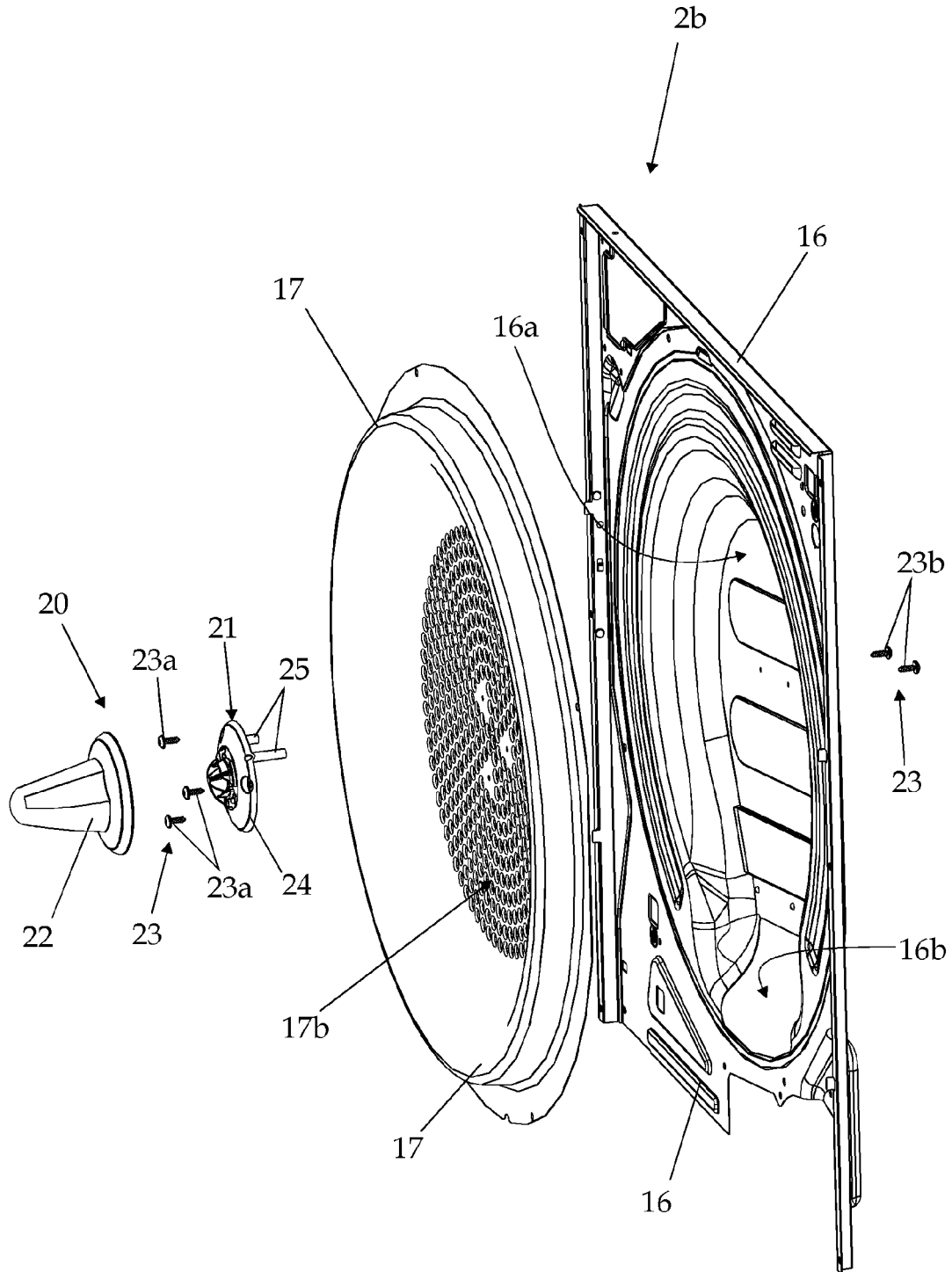


Fig. 3

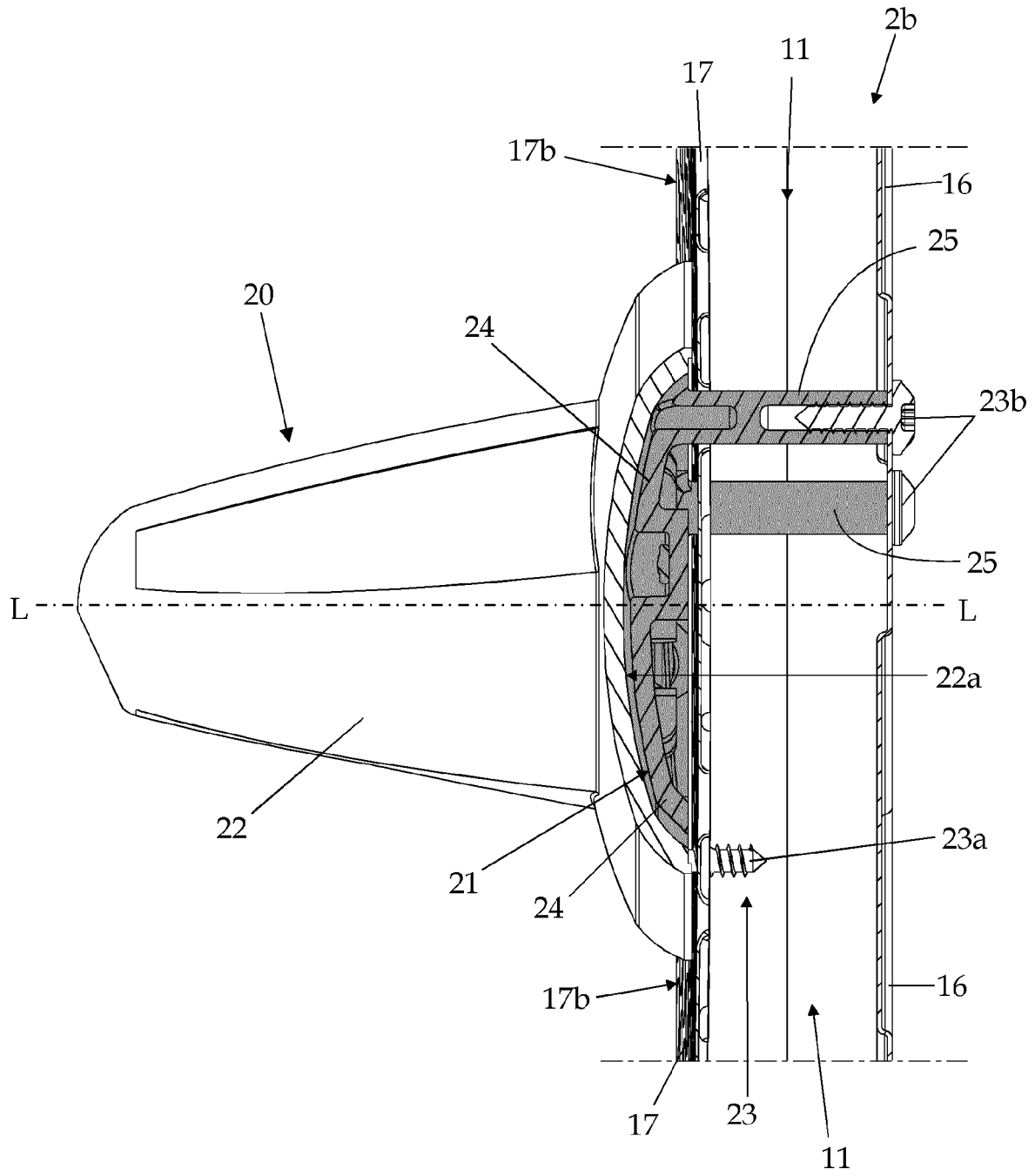


Fig. 4

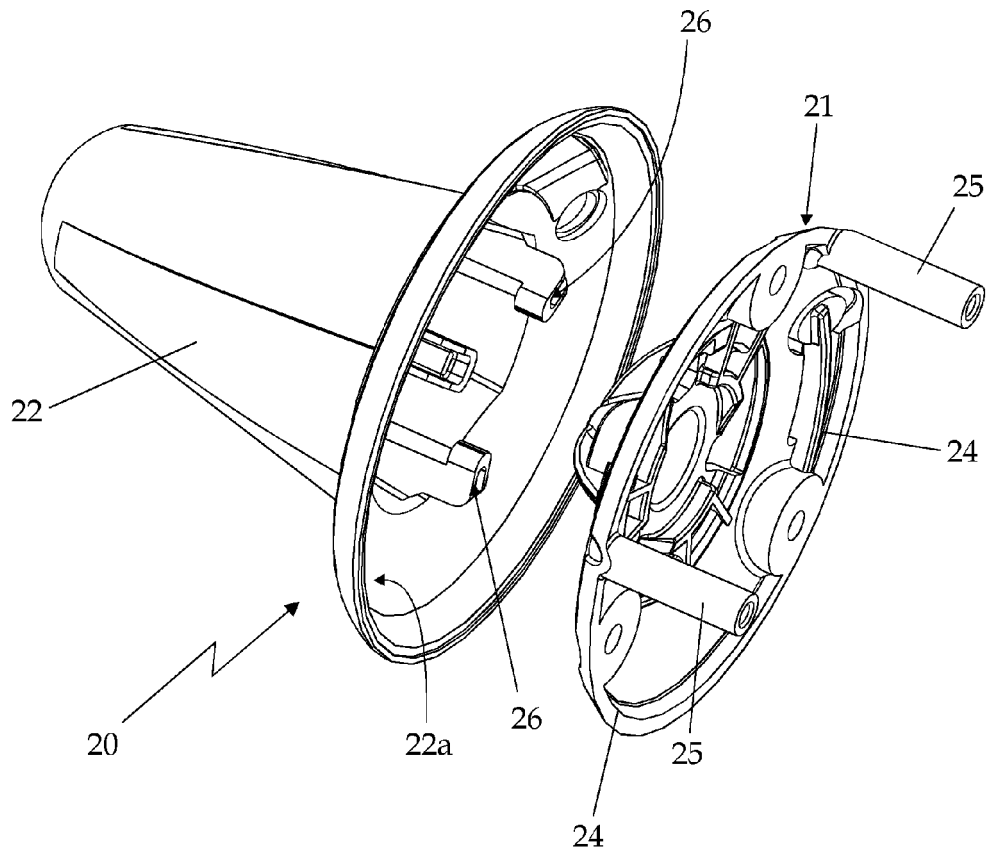


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 11 18 8147

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 4 April 2012	Examiner Richmond, Sarah
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	

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The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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