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(54) LAUNDRY DRYING DEVICE COMPRISING A FLUID DIFFUSER ARRANGED ABOVE AN EVAPORATOR IN THE DRYING AIR CHANNE

(57) Laundry device (100) with at least one fluid diffuser (115-1, 115-2) comprising an inner flow channel (121) for conducting the pumped water. The flow channel (121) comprises an inlet section (129), an intermediate section (131) and an outlet section (133). Pumped water enters the at least one diffuser (115-1, 115-2) through the inlet section (129), flows through the intermediate section (131) along a flow direction (121-1) and exits the at least one diffuser (115-1, 115-2) through the outlet section (133). A cavity (123) is formed in the outlet section (133) in a top wall (149) of the flow channel (121). The cavity (123) extends over a first width (141) of the flow channel (121) between two side walls (122-1, 122-2) of the flow channel (121). The cavity (123) is configured to receive air bubbles accommodated in the pumped water.

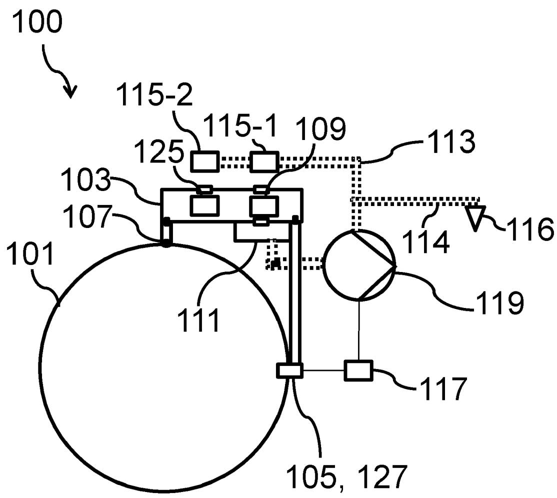

Fig. 1

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Description

[0001] The present disclosure relates to a laundry device comprising a diffuser, in particular to a dryer or wash-dryer comprising a diffuser.

BACKGROUND

[0002] In conventional laundry devices, such as dryers or wash-dryers, wet laundry is introduced into a laundry drum. During a drying process, liquid content of the wet laundry has to be reduced, for example, by removing liquid from the laundry. Typically, in conventional laundry devices, in particular in conventional laundry devices with a heat pump, an evaporator of a heat exchange mechanism is provided to reduce the humidity of air circulating in the drying process. During the drying process, impurities of the laundry, such as fluff, can be accommodated in the circulating air and can accumulate on the evaporator, thereby reducing the efficiency of the heat exchange mechanism and the drying process of the laundry.

SUMMARY

[0003] It is therefore an object of the present disclosure to provide a laundry device, in particular a dryer or wash-dryer, which allows efficient drying of laundry.

[0004] This object is achieved by way of the features of the independent patent claim. Advantageous developments are the subject matter of the dependent claims, the description, and the appended figures.

[0005] According to a first aspect, the present disclosure relates to laundry device, wherein the laundry device comprises a drying chamber for drying laundry and an air channel, wherein the air channel is connected with the drying chamber via an air inlet and an air outlet, wherein the air inlet is configured to feed air from the drying chamber into the air channel, wherein the air outlet is configured to feed the air from the air channel back into the drying chamber, wherein an evaporator is arranged downstream of the air inlet in the air channel, wherein the evaporator is configured to cool down the air supplied by the air inlet to condense water at the evaporator during cooling of the air, wherein impurities, in particular fluff, in the air are deposited at the evaporator, wherein the laundry device comprises a collection container arranged below the evaporator, wherein the collection container is configured to collect the condensed water of the evaporator, wherein the collection container is fluidly connected via a pumping line with at least one fluid diffuser, which is arranged above the evaporator, wherein the laundry device comprises a pump configured to pump the water collected in the collection container via the pumping line into the at least one fluid diffuser, wherein the at least one fluid diffuser is configured to feed the pumped water onto the evaporator to flush the impurities, in particular the fluff, from the evaporator into the collection container, wherein the at least one fluid diffuser comprises an inner flow channel for conducting the pumped water, wherein the flow channel comprises an inlet section, an intermediate section and an outlet section, wherein the pumped water enters the at least one diffuser through the inlet section, flows through the intermediate section along a flow direction and exits the at least one diffuser through the outlet section, wherein a cavity is formed in the outlet section in a top wall of the flow channel, wherein the cavity extends over a first width of the flow channel between two side walls of the flow channel, wherein the cavity is configured to receive air bubbles accommodated in the pumped water.

[0006] As a result, the pumped water can exit the at least one diffuser at the outlet section with a reduced percentage of air bubbles, in particular with almost no air bubbles, which can sectionally block and/or hinder a flow of water in a traditional diffuser. The at least one diffuser of the laundry device according to the first aspect can allow an even flow of the pumped water out of the outlet section of the at least one diffuser. Therefore, the impurities, in particular the fluff, can be flushed efficiently from the evaporator into the collection container. The air bubbles accommodated in the pumped water may dissolve at the cavity in order to fill at least a part of the volume of the cavity with air from the air bubbles.

[0007] A control of the laundry device may be configured to switch a ventil of a pump-out line connected to the collection container and activate the pump to pump water together with the impurities, in particular the fluff, out of the collection container through the pump-out line.

[0008] The laundry device according to the present disclosure in particular refers to a laundry device which is adapted to dry laundry, in particular by thereby removing or at least significantly reducing the amount of water attached to the laundry. In particular, the laundry device according to the present disclosure is a dryer, which is adapted to dry laundry. More particular, the laundry device according to the present disclosure is a heatpump tumble dryer.

[0009] According to an embodiment, a fan is arranged in the air channel, which is configured to feed the air from the air inlet into the air channel and out of the air outlet.

[0010] As a result, the air can be efficiently fed through the air channel. The fan may be arranged in the air inlet.

[0011] According to an embodiment, the evaporator is arranged in a heat cycle of a heat pump, wherein a cooling means is circulating in the heat cycle of the heat pump, which cooling means is configured to cool down the evaporator.

[0012] As a result, the evaporator can be efficiently operated. The heat cycle may further comprise a condenser for heating air, a compressor for increasing the temperature and the pressure of the cooling means and an expansion valve for reducing the temperature and the pressure of the cooling means. The expansion valve may be arranged downstream of the condenser in the heat cycle. The evaporator may be arranged downstream of the expansion valve in the heat cycle. The compressor may be arranged downstream of the evaporator in the heat cycle. The condenser may be arranged downstream of the compressor in the heat cycle.

[0013] According to an embodiment, the at least one fluid diffuser comprises a first fluid diffuser arranged above a section of the evaporator and a further first fluid diffuser arranged above a further section of the evaporator, wherein the first fluid diffuser is configured to feed the pumped water onto the section of the evaporator to flush the impurities, in particular the fluff, from the section of the evaporator into the collection container, wherein the further first fluid diffuser is configured to feed the pumped water onto the further section of the evaporator to flush the impurities, in particular the fluff, from the further section of the evaporator into the collection container, wherein a first valve is arranged in the pumping line, wherein the pumping line is connected to the first fluid diffuser in a first state of the first valve and wherein the pumping line is connected to the further first fluid diffuser in a second state of the first valve.

[0014] As a result, more effective evaporators, i.e. evaporators with greater dimensions, can be efficiently flushed and thereby used in the laundry device. The first valve may be controlled by a control of the laundry device in order to flush a different section of the evaporator.

[0015] According to an embodiment, the at least one fluid diffuser comprises a first fluid diffuser arranged above the evaporator and configured to feed the pumped water onto the evaporator to flush the impurities, in particular the fluff, from the evaporator into the collection container, wherein a condenser is arranged in the air channel downstream of the evaporator, wherein the condenser is configured to heat the air cooled by the evaporator, wherein further impurities, in particular further fluff, of the air are deposited at the condenser, wherein the collection container is arranged below the evaporator and the condenser, wherein the at least one fluid diffuser comprises a second fluid diffuser arranged above the condenser and configured to feed the pumped water onto the condenser to flush the further impurities, in particular further fluff, from the condenser into the collection container.

[0016] As a result, the efficiency of the condenser can be increased as well by cleaning it from the further impurities, in particular the further fluff. A valve may be controlled by a control of the laundry device in order to switch between flushing the condenser and flushing the evaporator.

[0017] According to an embodiment, the condenser is arranged in a heat cycle of a heat pump, wherein a cooling means is circulating in the heat cycle of the heat pump, which cooling means is configured to heat the condenser.

[0018] As a result, the condenser can be efficiently operated. The heat cycle may further comprise a compressor for increasing the temperature and the pressure of the cooling means and an expansion valve for reducing the temperature and the pressure of the cooling means. The expansion valve may be arranged downstream of the condenser in the heat cycle. The evaporator may be arranged downstream of the expansion valve in the heat cycle. The compressor may be arranged downstream of the evaporator in the heat cycle. The condenser may be arranged downstream of the compressor in the heat cycle.

[0019] According to an embodiment, the at least one fluid diffuser comprises a second fluid diffuser arranged above a section of the condenser and a further second fluid diffuser arranged above a further section of the condenser, wherein the second fluid diffuser is configured to feed the pumped water onto the section of the condenser to flush the impurities, in particular the fluff, from the section of the condenser into the collection container, wherein the further second fluid diffuser is configured to feed the pumped water onto the further section of the condenser to flush the impurities, in particular the fluff, from the further section of the condenser into the collection container, wherein a second valve is arranged in the pumping line, wherein the pumping line is connected to the second fluid diffuser in a first state of the second valve and wherein the pumping line is connected to the further second fluid diffuser in a second state of the second valve.

[0020] As a result, more effective condensers, i.e. condensers with greater dimensions, can be efficiently used in the laundry device. The second valve may be controlled by a control of the laundry device in order to flush a different section of the condenser.

[0021] According to an embodiment, the flow channel has a second width at the inlet section between the two side walls of the flow channel, wherein the second width is smaller than the first width, in particular wherein a width of the flow channel is continuously increasing from the second width along the flow direction to the first width.

[0022] As a result, the pumped water can efficiently flow in the flow channel from the second width to the first width along the flow direction.

[0023] According to an embodiment, the flow channel has a first height at the inlet section between a bottom wall of the flow channel and the top wall of the flow channel, wherein the flow channel has a second height in the intermediate section of the flow channel upstream of the cavity between the bottom wall of the flow channel and the top wall of the flow channel, wherein the second height of the flow channel is smaller than the first height of the flow channel, in particular wherein a height of the flow channel is continuously decreasing from the first height along the flow direction to the second height.

[0024] As a result, the pumped water can efficiently flow in the flow channel from the first height to the second height along the flow direction. The first height may be a maximum height of the inlet section between the bottom wall of the flow channel and the top wall of the flow channel. The second height may be a minimum height of the intermediate section upstream of the cavity between the bottom wall of the flow channel and the top wall of the flow channel.

[0025] According to an embodiment, the flow channel has a first height at the inlet section between a bottom wall of the flow channel and the top wall of the flow channel, wherein the cavity comprises a third height between a top wall of the cavity and the top wall of the flow channel, wherein the third height of the cavity is smaller than the first height of the flow channel.

[0026] As a result, the cavity can be efficiently formed to accommodate the air bubbles of the pumped water. The first height may be a maximum height of the inlet section between the bottom wall of the flow channel and the top wall of the flow channel. The third height may be a maximum height of the cavity.

[0027] According to an embodiment, the flow channel has a second height in the intermediate section of the flow channel upstream of the cavity between a bottom wall of the flow channel and the top wall of the flow channel, wherein the cavity comprises a third height between a top wall of the cavity and the top wall of the flow channel, wherein the third height of the cavity is greater than the second height of the flow channel.

[0028] As a result, the cavity can be efficiently formed to accommodate the air bubbles of the pumped water. The second height may be a minimum height of the intermediate section upstream of the cavity between the bottom wall of the flow channel and the top wall of the flow channel. The third height may be a maximum height of the cavity.

[0029] According to an embodiment, the cavity is formed in the shape of a cuboid or a ring-segment inside the at least one fluid diffuser.

[0030] As a result, the cavity can be efficiently formed to accommodate the air bubbles of the pumped water.

[0031] According to an embodiment, the top wall of the flow channel is gradually rising towards a top wall of the cavity at a sigmoidal section of the cavity.

[0032] As a result, the cavity can be efficiently formed to accommodate the air bubbles of the pumped water. The sigmoidal section may comprise a sigmoidal cross section of a section of the cavity with respect to an axis perpendicular to the flow direction.

[0033] According to an embodiment, the outlet section comprises a water outlet channel extending downwards, wherein a width of the water outlet channel between two side walls of the flow channel at the outlet section corresponds to the first width of the flow channel.

[0034] As a result, the pumped water can efficiently flow through the outlet section in the flow channel and out of the at least one diffuser over the evaporator, and in particular the condenser.

[0035] According to an embodiment, the flow channel and the water outlet channel are arranged in an angle between 80° and 100°, in particular 90°, to each other and/or wherein the flow channel and the water outlet channel are connected by a rounded edge.

[0036] As a result, the pumped water can efficiently flow out of the outlet section of the flow channel. The rounded edge may be formed below the cavity in the bottom wall of the flow channel.

[0037] According to an embodiment, the cavity is formed in the top wall of the flow channel above the water outlet channel.

[0038] As a result, the cavity can efficiently accommodate the air bubbles of the pumped water.

[0039] According to an embodiment, the cavity extends over the entire first width of the flow channel between the two side walls of the flow channel.

[0040] As a result, the cavity can efficiently accommodate the air bubbles of the pumped water.

BRIEF DESCRIPTION OF THE DRAWINGS

[0041] Further examples of the principles and techniques of that disclosure are explained in greater detail with reference to the appended drawings, in which:

Fig. 1 shows a schematic representation of a laundry device according to an embodiment;

Fig. 2 shows a schematic representation of an air channel of a laundry device according to an embodiment;

Fig. 3a schematically shows a cross-sectional top view of a fluid diffuser of a laundry device according to an embodiment;

Fig. 3a schematically shows a cross-sectional side view of a fluid diffuser of a laundry device according to an embodiment;

Fig. 3c schematically shows a cross-sectional side view of a fluid diffuser of a laundry device according to an embodiment; and

Fig. 4 shows a diagram illustrating a water distribution of water flowing through a diffuser at an outlet section of a laundry device according to an embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

[0042] Fig. 1 shows a schematic representation of a laundry device 100 according to an embodiment.

[0043] The laundry device 100, which is only schematically shown in Fig. 1, comprises a schematically shown drying chamber 101 for drying laundry, which may be arranged in an interior space of the laundry device 100. During a drying program of the laundry device 100 for performing a laundry treatment process, wet laundry, which may be received in the drying chamber 101, may be treated and afterwards the treated laundry may be taken out by the user from the drying chamber 101. During the drying program, the laundry may give off moisture and impurities, in particular fluff, to the air in the drying chamber 101.

[0044] As further shown in Fig. 1, the laundry device 100 comprises an air channel 103. The air channel 103 is connected with the drying chamber 101 via an air inlet 105 and an air outlet 107. The air inlet 105 is configured to feed air from the drying chamber 101 into the air channel 103. The air outlet 107 is configured to feed the air from the air channel 103 back into the drying chamber 101. A fan 127 may be arranged in the air channel 103, which is configured to feed the air from the air inlet 105 into the air channel 103 and out of the air outlet 107.

[0045] An evaporator 109 is arranged downstream of the air inlet 105 in the air channel 103. The evaporator 109 may be arranged in a heat cycle of a heat pump, wherein a cooling means is circulating in the heat cycle of the heat pump, which cooling means is configured to cool down the evaporator 109. The evaporator 109 is configured to cool down the air supplied by the air inlet 105 to condense water at the evaporator 109 during cooling of the air. Impurities, in particular fluff, in the air are deposited at the evaporator 109.

[0046] The laundry device 100 comprises a collection container 111 arranged below the evaporator 109. The collection container 111 is configured to collect the condensed water of the evaporator 109. The collection container 111 is fluidly connected via a pumping line 113 with at least one fluid diffuser 115-1, 115-2, which is arranged above the evaporator 109.

[0047] The at least one fluid diffuser 115-1, 115-2 may comprise a first fluid diffuser 115-1 arranged above the evaporator 109 and configured to feed the pumped water onto the evaporator 109 to flush the impurities, in particular the fluff, from the evaporator 109 into the collection container 111.

[0048] A condenser 125 may be arranged in the air channel 103 downstream of the evaporator 109. The condenser 125 may be configured to heat the air cooled by the evaporator 109. Further impurities, in particular further fluff, of the air may be deposited at the condenser 125. The collection container 111 may be arranged below the evaporator 109 and the condenser 125. The at least one fluid diffuser 115-1, 115-2 may comprise a second fluid diffuser 115-2 arranged above the condenser 125 and configured to feed the pumped water onto the condenser 125 to flush the further impurities, in particular further fluff, from the condenser 125 into the collection container 111.

[0049] The condenser 125 may be arranged in the heat cycle of the heat pump. The cooling means may be configured to heat the condenser 125.

[0050] The laundry device 100 comprises a pump 119 configured to pump the water collected in the collection container 111 via the pumping line 113 into the at least one fluid diffuser 115-1, 115-2. The at least one fluid diffuser 115-1, 115-2 is configured to feed the pumped water onto the evaporator 109 to flush the impurities, in particular the fluff, from the evaporator 109 into the collection container 111. A pump-out line 114 may be fluidly connected to the collection container 111 to remove water and the impurities, in particular the fluff, from the collection container 111 into a drain 116.

[0051] The laundry device 100 may comprise a control 117. During a drying program of the laundry device 100 or at the end of a drying program of the laundry device 100, the control 117 may be configured to activate the pump 119 to pump the water collected in the collection container 111 via the pumping line 113 into the at least one fluid diffuser 115-1, 115-2. The control 117 may be configured to activate the pump 119 to pump the water collected in the collection container 111 via the pumping line 113 into the at least one fluid diffuser 115-1, 115-2 when a moisture level of the laundry accommodated in the drying chamber 101 falls below a predetermined moisture level threshold during the drying program of the laundry device 100.

[0052] Fig. 2 shows a schematic representation of an air channel 103 of a laundry device 100 according to an embodiment. The laundry device 100 may be the laundry device 100 of Fig. 1. As described for Fig. 1, the laundry device 100 comprises a drying chamber 101, an evaporator 109, at least one fluid diffuser 115-1, an air inlet 105, an air outlet 107, a fan 127, a condenser 125, and a collection container 111.

[0053] Fig. 2 schematically shows an air flow direction 103-1 of the air in the air channel 103. Warm and wet air from the drying chamber 101 enters the air channel 103 through the air inlet 105, in which the fan 127 may be arranged and then passes the evaporator 109. At the evaporator 109 the air is cooled down and a moisture level of the air is reduced by condensation of water on the evaporator 109. Then the air passes the condenser 125 at which the air is heated again. The air then enters the drying chamber 101 through the air outlet 107 (not shown in Fig. 2).

[0054] As further shown in Fig. 2, the collection container 111 may be arranged below the evaporator 109 and the air channel 103 to collect the water condensed at the evaporator 109 and the pumped water flushed by the at least one diffuser 115-1. The collection container 111 may comprise openings 111-1 for passing the condensed water and the pumped water into the collection container 111.

[0055] Fig. 3a schematically shows a cross-sectional top view of a fluid diffuser 115-1, 115-2 of a laundry device 100 according to an embodiment. The laundry device 100 may be the laundry device 100 of Fig. 1.

[0056] As illustrated in Fig. 3a, the at least one fluid diffuser 115-1, 115-2 comprises an inner flow channel 121 for conducting the pumped water. The flow channel 121 comprises an inlet section 129, an intermediate section 131 and an outlet section 133. The pumped water enters the at least one diffuser 115-1, 115-2 through the inlet section 129, flows through the intermediate section 131 along a flow direction 121-1 and exits the at least one diffuser 115-1, 115-2 through the outlet section 133.

[0057] A cavity 123 (not shown in Fig. 3a) is formed in the outlet section 133 in a top wall 149 (also not shown in Fig. 3a) of the flow channel 121. The cavity 123 extends over a first width 141 of the flow channel 121, in particular over the entire first width 141 of the flow channel 121, between two side walls 122-1, 122-2 of the flow channel 121. The cavity 123 is configured to receive air bubbles accommodated in the pumped water.

[0058] As further illustrated in Fig. 3a, the flow channel 121 may have a second width 143 at the inlet section 129 between the two side walls 122-1, 122-2 of the flow channel 121. The second width 143 may be smaller than the first width 141, in particular a width of the flow channel 121 may be continuously increasing from the second width 143 along the flow direction 121-1 to the first width 141.

[0059] Fig. 3b schematically shows a cross-sectional side view of a fluid diffuser 115-1, 115-2 of a laundry device 100 according to an embodiment. The laundry device 100 may be the laundry device 100 of Fig. 1. The fluid diffuser 115-1, 115-2 may be the fluid diffuser 115-1, 115-2 of Fig. 3a.

[0060] As illustrated in Fig. 3b, the flow channel 121 may have a first height 147 at the inlet section 129 between a bottom wall 137 of the flow channel 121 and the top wall 149 of the flow channel 121. The flow channel 121 may have a second height 151 in the intermediate section 131 of the flow channel upstream of the cavity 123 between the bottom wall 137 of the flow channel 121 and the top wall 149 of the flow channel 121. The second height 151 of the flow channel 121 may be smaller than the first height 147 of the flow channel 121, in particular a height of the flow channel 121 may be continuously decreasing from the first height 147 along the flow direction 121-1 to the second height 151.

[0061] The bottom wall 137 of the flow channel 121 may be monotonously rising along the flow direction 121-1 from the first height 147 to the second height 151, in particular the bottom wall 137 of the flow channel 121 may form an elevation 139 along the flow direction 121-1 from the first height 147 to the second height 151. The top wall 149 of the flow channel 121 may be monotonously falling along the flow direction 121-1 from the first height 147 to the second height 151.

[0062] As further illustrated in Fig. 3b, the cavity 123 comprises a third height 153 between a top wall 145 of the cavity 123 and a top wall 149 of the flow channel 121. As shown in Fig. 3a, the third height 153 may be measured between the top wall 145 of the cavity 123 and an auxiliary line 154, which corresponds to a height of flow channel 121 at the second height 151. The third height 153 of the cavity 123 may be smaller than the first height 147 of the flow channel 121. Alternatively or additionally, the third height 153 of the cavity 123 may be greater than the second height 151 of the flow channel 121.

[0063] The cavity 123 may be formed in the shape of a cuboid or a ring-segment inside the at least one fluid diffuser 115-1, 115-2 in the top wall 149 of the at least one fluid diffuser 115-1, 115-2.

[0064] The outlet section 133 may comprise a water outlet channel 135 extending downwards. A width of the water outlet channel 135 between the two side walls 122-1, 122-2 of the flow channel 121 at the outlet section 133 may correspond to the first width 141 (not shown in Fig. 3b) of the flow channel 121. The flow channel 121 and the water outlet channel 135 may be arranged in an angle between 80° and 100°, in particular 90°, to each other. Additionally or alternatively, the flow channel 121 and the water outlet channel 135 may be connected by a rounded edge.

[0065] The cavity 123 may be formed in the top wall 14 of the flow channel 121 above the water outlet channel 135.

[0066] Fig. 3c schematically shows a cross-sectional side view of a fluid diffuser 115-1, 115-2 of a laundry device 100 according to an embodiment. The laundry device 100 may be the laundry device 100 of Fig. 1. The fluid diffuser 115-1, 115-2 may be the fluid diffuser 115-1, 115-2 of Fig. 3a.

[0067] As illustrated in Fig. 3c, the top wall 149 of the flow channel 121 may be gradually rising towards a top wall of the cavity 123 at a sigmoidal section 155 of the cavity 123. The sigmoidal section 155 may comprise a sigmoidal cross section of a section of the cavity 123 with respect to an axis perpendicular to the flow direction 121-1.

[0068] Fig. 4 shows a diagram illustrating a water distribution of water flowing through at least one diffuser 115-1, 115-2 (shown in Figures 3a-c) at an outlet section 133 of a laundry device 100 according to an embodiment. The laundry device 100 may be the laundry device 100 of Fig. 1. The fluid diffuser 115-1, 115-2 may be the fluid diffuser 115-1, 115-2 of Fig. 3a. The abscissa shows different measurement points along the first width 141 and the ordinate shows values of the waterflow in g/mm/30sec.

[0069] A first curve 157 shows the water distribution of a traditional diffuser. A second curve 159 shows a theoretical optimal water distribution. As can be seen by the comparison of the first curve 157 with the second curve 159, the traditional diffuser has an uneven water flow distribution, in particular at the outer measurement points near the side walls 122-1, 122-2 of the traditional diffuser.

[0070] A third curve 161 shows the water distribution of the water flowing through the at least one diffuser 115-1, 115-2 at the outlet section 133 of the laundry device 100. As can be seen by the comparison of the third curve 161 with the second curve 159 and the first curve 157, the at least one diffuser 115-1, 115-2 has a more even water flow distribution in comparison with the traditional diffuser and is close to the theoretical optimal water distribution.

REFERENCE NUMBERS

[0071]

100 laundry device

101	drying chamber
103	air channel
103-1	air flow direction in the air channel
105	air inlet
107	air outlet
109	evaporator
111	collection container
111-1	openings
113	pumping line
114	pump-out line
115-1	first fluid diffuser
115-2	second fluid diffuser
116	drain
117	control
119	pump
121	flow channel
121-1	flow direction in the flow channel
122-1	first side wall
122-2	second side wall
123	cavity
125	condenser
127	fan
129	inlet section
131	intermediate section
133	outlet section
135	water outlet channel
137	bottom wall
139	elevation
141	first width
143	second width
145	top wall of the cavity
147	first height
149	top wall of the flow channel
151	second height
153	third height
154	auxiliary line
155	sigmoidal section
157	first curve
159	second curve
161	third curve

Claims

1. Laundry device (100), wherein the laundry device (100) comprises a drying chamber (101) for drying laundry and an air channel (103), wherein the air channel (103) is connected with the drying chamber (101) via an air inlet (105) and an air outlet (107), wherein the air inlet (105) is configured to feed air from the drying chamber (101) into the air channel (103), wherein the air outlet (107) is configured to feed the air from the air channel (103) back into the drying chamber (101), wherein an evaporator (109) is arranged downstream of the air inlet (105) in the air channel (103), wherein the evaporator (109) is configured to cool down the air supplied by the air inlet (105) to condense water at the evaporator (109) during cooling of the air, wherein impurities, in particular fluff, in the air are deposited at the evaporator (109), wherein the laundry device (100) comprises a collection container (111) arranged below the evaporator (109), wherein the collection container (111) is configured to collect the condensed water of the evaporator (109), wherein the collection container (111) is fluidly connected via a pumping line (113) with at least one fluid diffuser (115-1, 115-2), which is arranged above the evaporator (109),

   wherein the laundry device (100) comprises a pump (119) configured to pump the water collected in the collection container (111) via the pumping line (113) into the at least one fluid diffuser (115-1, 115-2), wherein the at least one fluid diffuser (115-1, 115-2) is configured to feed the pumped water onto the evaporator (109) to flush the impurities, in particular the fluff, from the evaporator (109) into the collection container (111),
   wherein the at least one fluid diffuser (115-1, 115-2) comprises an inner flow channel (121) for conducting the pumped water, wherein the flow channel (121) comprises an inlet section (129), an intermediate section (131) and an outlet section (133), wherein the pumped water enters the at least one diffuser (115-1, 115-2) through the inlet section (129), flows through the intermediate section (131) along a flow direction (121-1) and exits the at least one diffuser (115-1, 115-2) through the outlet section (133),
   characterized in that a cavity (123) is formed in the outlet section (133) in a top wall (149) of the flow channel (121), wherein the cavity (123) extends over a first width (141) of the flow channel (121) between two side walls (122-1, 122-2) of the flow channel (121), wherein the cavity (123) is configured to receive air bubbles accommodated in the pumped water.

2. Laundry device (100) according to claim 1, wherein a fan (127) is arranged in the air channel (103), which is configured to feed the air from the air inlet (105) into the air channel (103) and out of the air outlet (107).

3. Laundry device (100) according to claim 1 or 2, wherein the evaporator (109) is arranged in a heat cycle of a heat pump, wherein a cooling means is circulating in the heat cycle of the heat pump, which cooling means is configured to cool down the evaporator (109).

4. Laundry device (100) according to according to any one of the preceding claims, wherein the at least one fluid diffuser (115-1, 115-2) comprises a first fluid diffuser (115-1) arranged above the evaporator (109) and configured to feed the pumped water onto the evaporator (109) to flush the impurities, in parti-

cular the fluff, from the evaporator (109) into the collection container (111),
wherein a condenser (125) is arranged in the air channel (103) downstream of the evaporator (109), wherein the condenser (125) is configured to heat the air cooled by the evaporator (109), wherein further impurities, in particular further fluff, of the air are deposited at the condenser (125), wherein the collection container (111) is arranged below the evaporator (109) and the condenser (125), wherein the at least one fluid diffuser (115-1, 115-2) comprises a second fluid diffuser (115-2) arranged above the condenser (125) and configured to feed the pumped water onto the condenser (125) to flush the further impurities, in particular further fluff, from the condenser (125) into the collection container (111).

5. Laundry device (100) according to claim 4, wherein the condenser (125) is arranged in a heat cycle of a heat pump, wherein a cooling means is circulating in the heat cycle of the heat pump, which cooling means is configured to heat the condenser (125).

6. Laundry device according to any one of the preceding claims, wherein the flow channel (121) has a second width (143) at the inlet section (129) between the two side walls (122-1, 122-2) of the flow channel (121), wherein the second width (143) is smaller than the first width (141), in particular wherein a width of the flow channel (121) is continuously increasing from the second width (143) along the flow direction (121-1) to the first width (141).

7. Laundry device according to any one of the preceding claims, wherein the flow channel (121) has a first height (147) at the inlet section (129) between a bottom wall (137) of the flow channel (121) and the top wall (149) of the flow channel (121), wherein the flow channel (121) has a second height (151) in the intermediate section (131) of the flow channel upstream of the cavity (123) between the bottom wall (137) of the flow channel (121) and the top wall (149) of the flow channel (121), wherein the second height (151) of the flow channel (121) is smaller than the first height (147) of the flow channel (121), in particular wherein a height of the flow channel (121) is continuously decreasing from the first height (147) along the flow direction (121-1) to the second height (151).

8. Laundry device according to any one of the preceding claims, wherein the flow channel (121) has a first height (147) at the inlet section (129) between a bottom wall (137) of the flow channel (121) and the top wall (149) of the flow channel (121), wherein the cavity (123) comprises a third height (153) between a top wall (145) of the cavity (123) and the top wall (149) of the flow channel (121), wherein the third height (153) of the cavity (123) is smaller than the first height (147) of the flow channel (121).

9. Laundry device according to any one of the preceding claims, wherein the flow channel (121) has a second height (151) in the intermediate section (131) of the flow channel upstream of the cavity (123) between a bottom wall (137) of the flow channel (121) and the top wall (149) of the flow channel (121), wherein the cavity (123) comprises a third height (153) between a top wall (145) of the cavity (123) and the top wall (149) of the flow channel (121), wherein the third height (153) of the cavity (123) is greater than the second height (151) of the flow channel (121).

10. Laundry device according to any one of the preceding claims, wherein the cavity (123) is formed in the shape of a cuboid or a ring-segment inside the at least one fluid diffuser (115-1, 115-2).

11. Laundry device according to according to any one of the preceding claims, wherein the top wall (149) of the flow channel (121) is gradually rising towards a top wall of the cavity (123) at a sigmoidal section (155) of the cavity (123).

12. Laundry device according to any one of the preceding claims, wherein the outlet section (133) comprises a water outlet channel (135) extending downwards, wherein a width of the water outlet channel (135) between two side walls (122-1, 122-2) of the flow channel (121) at the outlet section (133) corresponds to the first width (141) of the flow channel (121).

13. Laundry device according to claim 12, wherein the flow channel (121) and the water outlet channel (135) are arranged in an angle between 80° and 100°, in particular 90°, to each other and/or wherein the flow channel (121) and the water outlet channel (135) are connected by a rounded edge.

14. Laundry device according to claim 12 or 13, wherein the cavity (123) is formed in the top wall (14) of the flow channel (121) above the water outlet channel (135).

15. Laundry device according to any one of the preceding claims, wherein the cavity (123) extends over the entire first width (141) of the flow channel (121) between the two side walls (122-1, 122-2) of the flow channel (121).

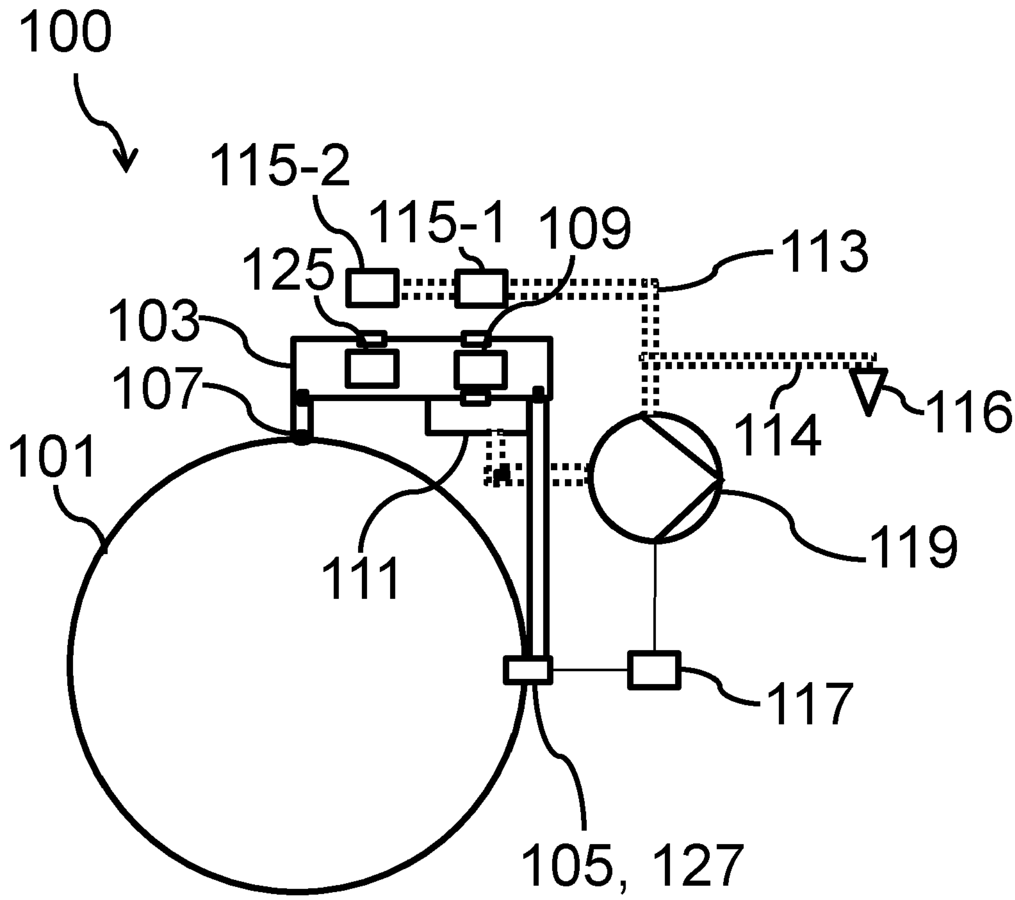

100
115-2
115-1
109
113
125
103
107
101
116
114
111
119
117
105, 127

Fig. 1

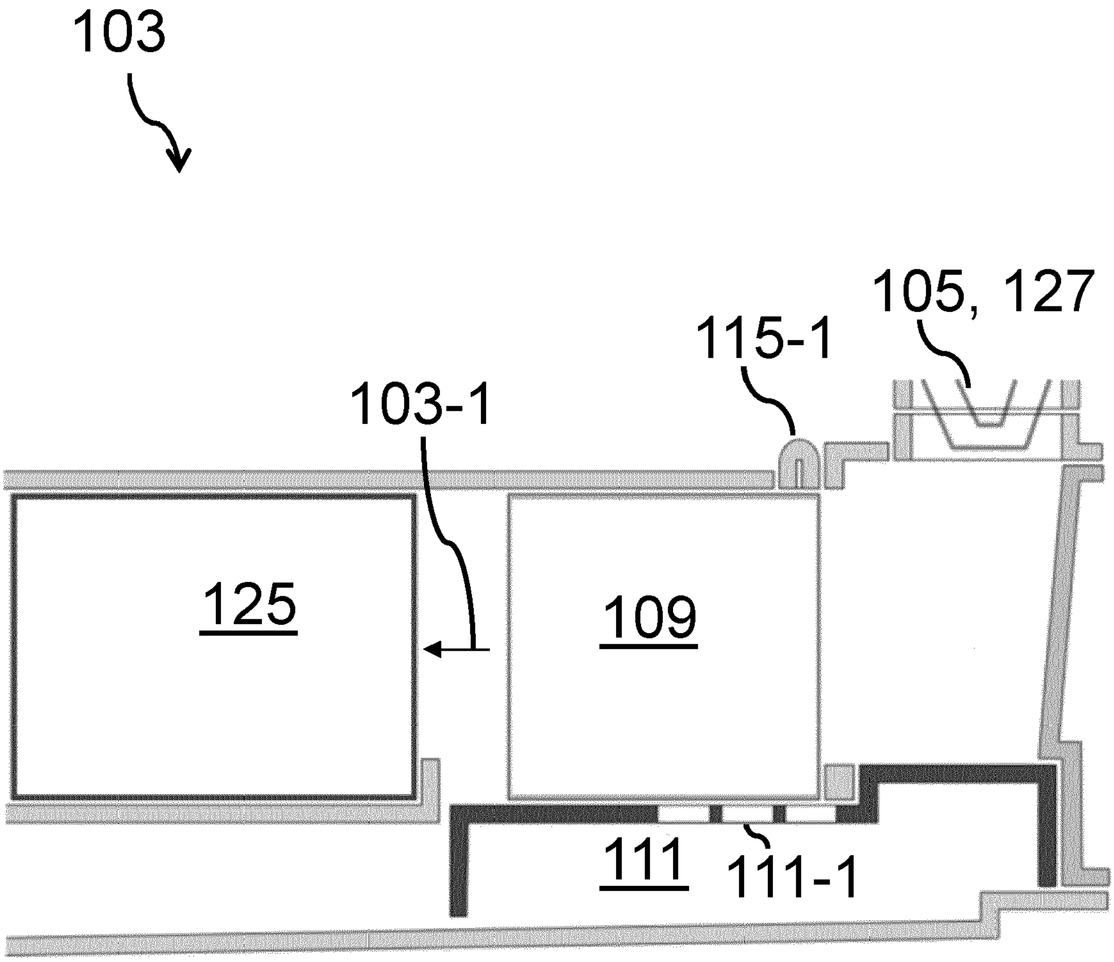


Fig. 2

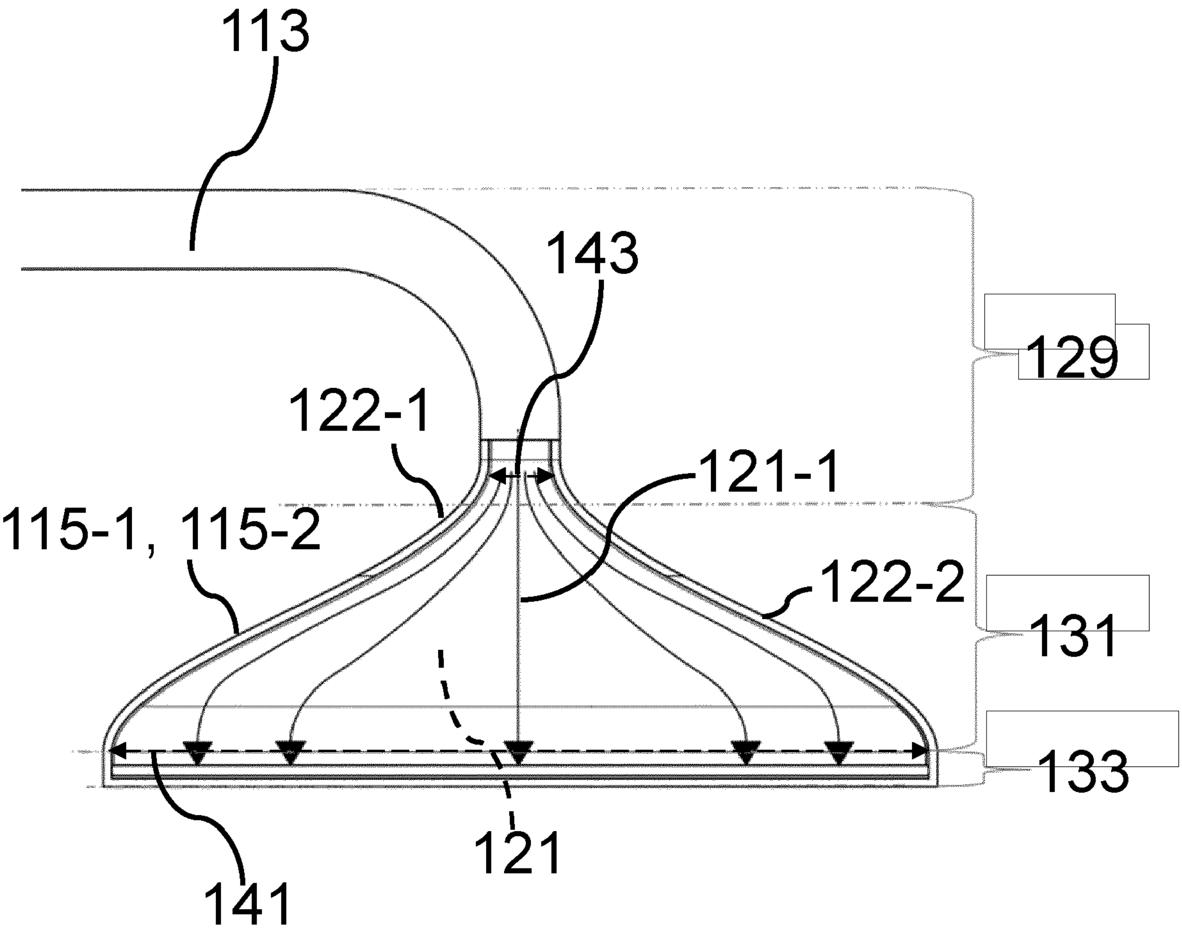


Fig. 3a

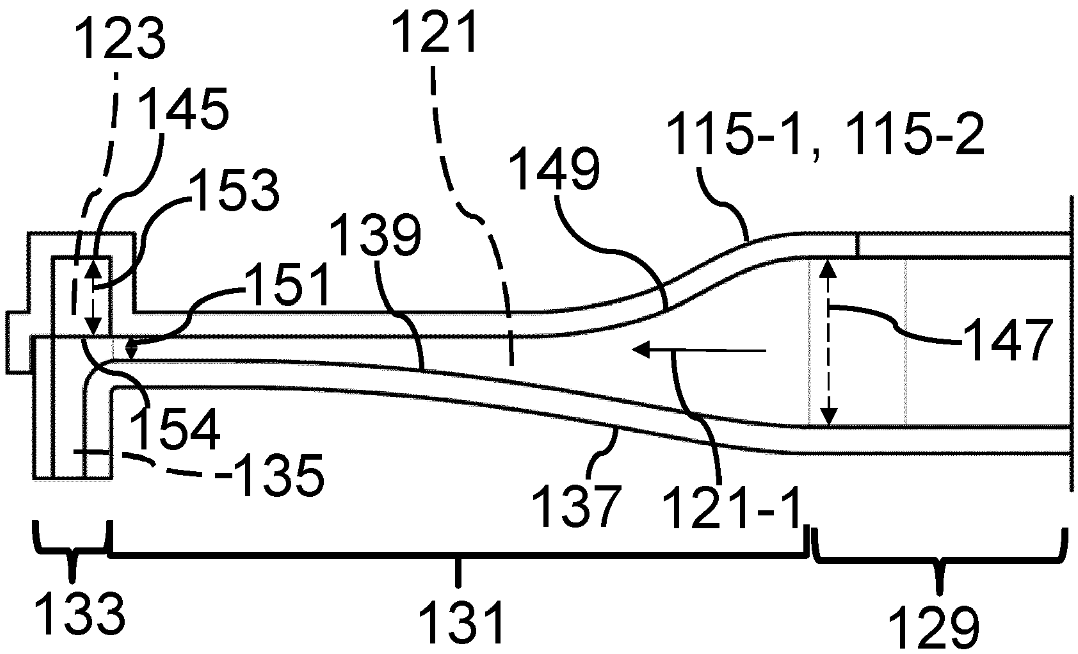

123
121
145
153
139
149
115-1, 115-2
151
147
154
135
137
121-1
133
131
129

Fig. 3b

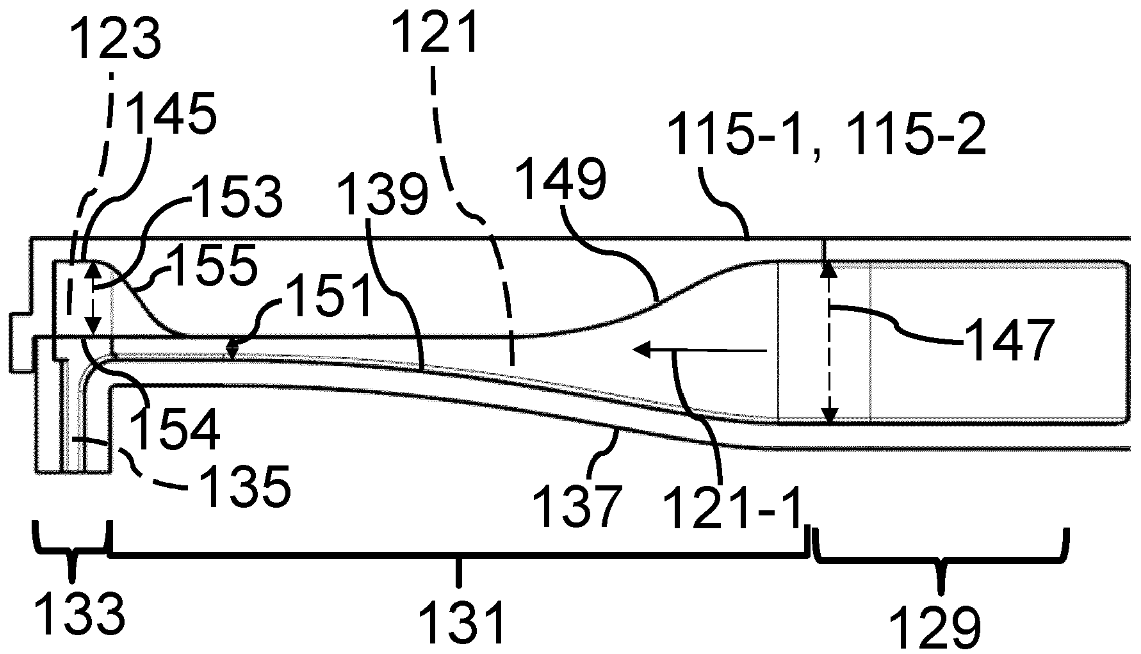
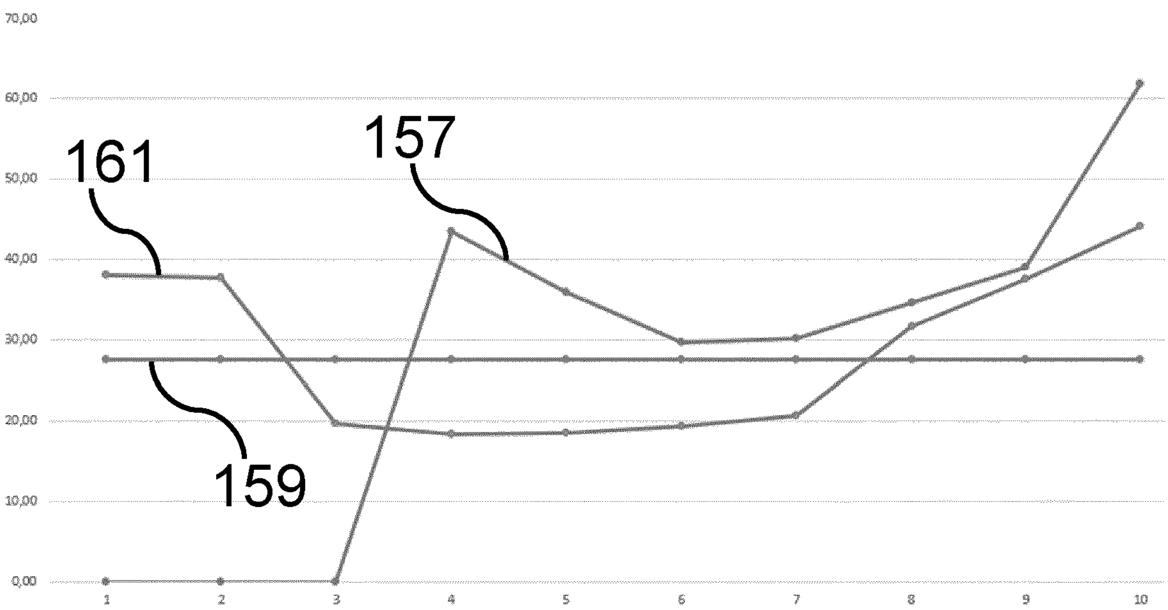

123
121
145
115-1, 115-2
153
139
149
155
151
147
154
135
137
121-1
133
131
129

Fig. 3c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9
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161
157
159

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 23 21 8510

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The present search report has been drawn up for all claims

1

Place of search	Date of completion of the search	Examiner
Munich	15 May 2024	Sabatucci, Arianna

CATEGORY OF CITED DOCUMENTS

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15-05-2024

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