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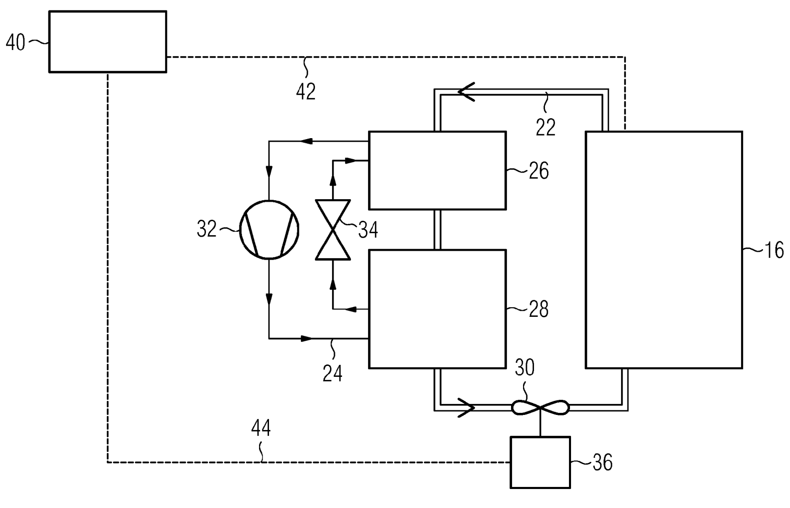
(54) **A method for controlling a drying cycle of a laundry dryer in dependence of the load and a corresponding laundry dryer**

(57) The present invention relates to a method for controlling a drying cycle of a laundry dryer (10) in dependence of the amount of load inside a laundry drum (16), comprising the steps of: detecting an electric resistance and/or an electric conductivity between two or more electrodes (12, 14) at least partly contacting the laundry inside the laundry drum (16) and, estimating the amount of load inside the laundry drum (16) by evaluating the noise and/or fluctuation of the detected electric resistance and/or conductivity, and controlling a rotation speed (v) of a drying air stream fan (30) for conveying a drying air stream through the laundry drum (16) in response to the estimated amount of load inside the laundry drum (16), wherein the rotation speed (v) of the drying air stream fan increases with a decreasing amount of load in the laundry drum (16). Further, the present invention relates to a corresponding laundry dryer (10).

FIG 4



Description

[0001] The present invention relates to a method for controlling a drying cycle of a laundry dryer in dependence of the amount of load inside a laundry drum. Further, the present invention relates to a corresponding laundry dryer.

[0002] Often the full capacity of a laundry drum in a laundry dryer is not exploited. It is not unusual that only about the half of the maximum load capacity is loaded in the laundry drum of the laundry dryer. Thus, it would be advantageous to adapt the drying cycle of the laundry dryer to the reduced load inside the laundry drum in order to avoid consumption of energy, which is not required, and/or to reduce drying cycle time.

[0003] It is an object of the present invention to provide a method for controlling a drying cycle of a laundry dryer in dependence of the amount of load inside a laundry drum, wherein said method maximises the performance of the machine. It is further an object of the present invention to provide a corresponding laundry dryer.

[0004] The object of the present invention is achieved by the method according to claim 1.

[0005] The method according to the present invention is provided for controlling a drying cycle of a laundry dryer in dependence of the amount of load inside a laundry drum, comprising the steps of:

- detecting an electric resistance and/or an electric conductivity between two or more electrodes (12, 14) at least partly contacting the laundry inside the laundry drum (16) and,
- estimating the amount of load inside the laundry drum (16) by evaluating the noise and/or fluctuation of the detected electric resistance and/or conductivity, and
- controlling a rotation speed (v) of a drying air stream fan (30) for conveying a drying air stream through the laundry drum (16) in response to the estimated amount of load inside the laundry drum (16), wherein the rotation speed (v) of the drying air stream fan increases with a decreasing amount of load in the laundry drum (16).

[0006] One aspect of the present invention bases on the fact that it has been found a correlation between the electric signal and the amount of load in the laundry drum. Another aspect of the present invention is that the rotation speed of an drying air stream fan for conveying a drying air stream through the laundry drum is made dependent on the amount of load inside the laundry to improve the drying performances of the laundry dryer. Particularly, the rotation speed of the drying air stream fan increases with a decreasing amount of load in the laundry drum.

[0007] In particular, noise and/or fluctuations of a electric signal corresponding to the electric resistance and/or an electric conductivity between the electrodes are used for estimating the amount of load in the laundry drum.

[0008] It has been found that the value of peaks, and/or the number of peaks within a time span and/or the area subtended by peaks of an electric signal corresponding to the detected electric resistance and/or conductivity is/are related to the amount of laundry load inside the laundry drum.

[0009] For example the number of peaks within a time span of said electric signal increases with a decreasing amount of load in said laundry drum. The smaller is the load inside the laundry drum, the higher is the number or frequency of the detected peaks, and the higher is an electrical noise measured by the conductimetric system.

[0010] Further, it has been found that the area subtended by peaks of an electric signal corresponding to the detected electric resistance and/or conductivity increases with a decreasing amount of load in said laundry drum and similarly the value of peaks of an electric signal corresponding to the detected electric resistance and/or conductivity increases with a decreasing amount of load in said laundry drum

[0011] Evaluating the noise and/or fluctuation of the detected electric resistance and/or conductivity comprises:

- measuring the value of peaks of an electric signal corresponding to the detected electric resistance and/or conductivity, and/or
- measuring the number of peaks within a time span of an electric signal corresponding to the detected electric resistance and/or conductivity, and/or
- measuring the area subtended by peaks of an electric signal corresponding to the detected electric resistance and/or conductivity.

[0012] Preferably, the rotation speed of the drying air stream fan increases when the estimated amount of load inside the laundry drum is above a predetermined threshold.

[0013] Preferably, a rotation speed of the laundry drum is controlled, wherein the rotation speed of the laundry drum is proportional to the rotation speed of the drying air stream fan. In this case, only one motor is required for the drying air stream fan and the laundry drum.

[0014] Further, the electric resistance and/or electric conductivity between the electrodes may be detected within a predetermined time interval at the beginning of the drying cycle after the laundry starts to rotate

[0015] For example, the time interval takes between two minutes and ten minutes, in particular five minutes.

[0016] In particular, before the amount of load inside the laundry drum has been estimated, the drying air stream fan is driven with an average rotation speed.

[0017] According to one embodiment, the drying air stream fan is activated with a constant rotation speed, after the amount of load inside the laundry drum has been estimated. Alternatively, the drying air stream fan is activated with a rotation speed oscillating around a mean value, after the amount of load inside the laundry drum has been estimated, wherein said mean value depends on the amount of load inside the laundry drum.

[0018] According to a further embodiment, the drying air stream fan and the laundry drum change periodically the sense of rotation, after the amount of load inside the laundry drum has been estimated.

[0019] Preferably, the method includes the step of controlling the speed of a heat pump compressor motor of the laundry dryer, wherein the speed of the heat pump compressor motor increases in response to an increasing of the rotation speed of the drying air stream fan.

[0020] The object of the present invention is further achieved by the laundry dryer according to claim 12.

[0021] A laundry dryer of the present invention comprises a laundry drum, a drying air stream fan for conveying a drying air stream through the laundry drum and

- at least two electrodes provided for detecting an electric resistance and/or an electric conductivity of the laundry inside the laundry drum,
- a control unit is provided for estimating the amount of load inside the laundry drum by evaluating electric resistance and/or an electric conductivity, wherein
- the control unit is provided for controlling a rotation speed of the drying air stream fan in response to the estimated amount of load inside the laundry drum, and wherein
- the control unit is adapted to drive the drying air stream fan to a first rotation speed corresponding with a first amount of load in the laundry drum and to a second rotation speed corresponding with a second amount of load in said laundry drum, wherein the first rotation speed is higher than the second rotation speed and the first amount is smaller than the second amount.

[0022] The laundry dryer of the present invention uses the fact that it has been found a correlation between the electric signal and the amount of load in the laundry drum. Another aspect of the laundry dryer of the present invention is that the rotation speed of an drying air stream fan for conveying an air stream through the laundry drum is made dependent on the amount of load inside the laundry to increase the drying performance of the laundry dryer. A higher rotation speed corresponds with the smaller amount of load and a lower rotation speed corresponds with the bigger amount of load in the laundry drum.

[0023] In particular, noise and/or fluctuations of the electric signal are used for estimating the amount of load in the laundry drum, wherein the frequency of the electric signal and/or the number of peaks within a time span of said electric signal increases with a decreasing amount of load in said laundry drum. The smaller is the load inside the laundry drum, the higher is the number or frequency of the detected peaks, and the higher is an electrical noise measured by the conductimetric system.

[0024] Further, it has been found that the area subtended by peaks of an electric signal corresponding to the detected electric resistance and/or conductivity increases with a decreasing amount of load in said laundry drum and similarly the value of peaks of an electric signal corresponding to the detected electric resistance and/or conductivity increases with a decreasing amount of load in said laundry drum

[0025] Preferably, the control unit is provided for controlling the rotation speed of the laundry drum.

[0026] Preferably a single motor is provided for driving into rotation both the laundry drum and the drying air stream fan.

[0027] Preferably a first motor is provide for driving into rotation the laundry drum and a second motor independent from the first motor is provided for driving into rotation the drying air stream fan.

[0028] In particular, the electrodes are arranged at a rear side of a front frame of the laundry dryer and at an opening of said laundry dryer.

[0029] For example, the electrodes are elongated and arranged in parallel.

[0030] According to a preferred embodiment of the present invention, the laundry dryer comprises a heat pump system. In this case, additionally the rotation speed of a compressor motor of said heat pump system may be controlled by the control unit so that the control unit is adapted to increase the rotation speed of the compressor motor in response to the rotation speed variation of the drying air stream fan.

[0031] Alternatively, the laundry dryer may comprise an air-to-air heat exchanger thermally connected to an air stream circuit of the laundry dryer.

[0032] At last, the laundry dryer is provided for the method for controlling a drying cycle mentioned above.

[0033] The novel and inventive features believed to be the characteristic of the present invention are set forth in the appended claims.

[0034] The invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a schematic sectional side view of a laundry dryer with two electrodes according to a preferred embodiment of the present invention,

FIG 2 illustrates a detailed sectional side view of the electrodes of the laundry dryer according to the preferred embodiment of the present invention,

FIG 3 illustrates a schematic perspective rear view of a front frame of the laundry dryer with the electrodes according to the preferred embodiment of the present invention,

FIG 4 illustrates a schematic diagram of a first embodiment of the laundry dryer with a heat pump system according to the present invention, FIG 5 illustrates a schematic diagram of a second embodiment of the laundry dryer with the heat pump system according to the present invention,

FIG 6 illustrates a schematic diagram of a first embodiment of the laundry dryer with an air-to-air condenser according to the present invention,

FIG 7 illustrates a schematic diagram of a second embodiment of the laundry dryer with the air-to-air condenser according to the present invention,

FIG 8 illustrates three diagrams of rotation speeds of an drying air stream fan as function of the time according to a first example of the present invention,

FIG 9 illustrates three diagrams of rotation speeds of the drying air stream fan as function of the time according to a second example of the present invention,

FIG 10 illustrates a diagram of the rotation speed of the drying air stream as function of the time according to a third example of the present invention,

FIG 11 illustrates a diagram of the rotation speed of the drying air stream fan as function of the time according to a fourth example of the present invention, and

FIG 12 illustrates a diagram of the rotation speed of the drying air stream fan as function of the time according to a fifth example of the present invention.

[0035] FIG 1 illustrates a schematic sectional side view of a laundry dryer 10 with two electrodes 12 and 14 according to a preferred embodiment of the present invention. The laundry dryer 10 includes a laundry drum 16, a front door 18 and a front frame 20. A front free end 17 of the laundry drum 16 is rotatably connected to a rear side of the front frame 20 via a sealing member 21 interposed between the front free end 17 of the laundry drum 16 and the rear side of the front frame 20 as shown in figure 2.

[0036] The electrodes 12 and 14 are attached at the rear side of the front frame 20. Further, the electrodes 12 and 14 are arranged at a lower portion of a laundry loading front opening of the laundry drum 12 and below the front door 18. A first electrode 12 is arranged above a second electrode 14.

[0037] FIG 2 illustrates a detailed sectional side view of the electrodes 12 and 14 of the laundry dryer 10 according to the preferred embodiment of the present invention. FIG 2 shows that the distance between the electrodes 12 and 14 is relative small.

[0038] FIG 3 illustrates a schematic perspective rear view of a front frame 20 of the laundry dryer with the electrodes 12 and 14 according to the preferred embodiment of the present invention. The electrodes 12 and 14 are elongated and arranged in parallel to each other. The electrodes 12 and 14 extend substantially horizontally.

[0039] The electrodes 12 and 14 are parts of a conductimetric system. Said conductimetric system is provided for detecting the dryness degree of the laundry inside the drum and for estimating the amount of load in the laundry drum 16. For this purpose a level of electrical noise and/or fluctuation during the first minutes of a drying cycle is used. The wet load can connect electrically the first electrode 12 to the second electrode 14, when a part of the wet load touches simultaneously the first electrode 12 and the second electrode 14. If the wet load in the laundry drum 16 does not touch simultaneously the first electrode 12 and the second electrode 14, then a peak is detected by the conductimetric system.

[0040] It has been found that there is a correlation between the number or frequency of peaks of the electric signal and the amount of load in the laundry drum 16. The smaller the load is inside the laundry drum 16, the higher is the number or frequency of the detected peaks, and the higher is an electrical noise measured by the conductimetric system. Further, it has been found that also the value of peaks of an electric signal corresponding to the detected electric resistance and/or conductivity, and also the area subtended by peaks of an electric signal corresponding to the detected electric resistance and/or conductivity are related to the amount of load inside the laundry drum 16.

[0041] FIG 4 illustrates a schematic diagram of a first embodiment of the laundry dryer 10 with a heat pump system according to the present invention.

[0042] The heat pump system comprises an air stream circuit 22, preferably closed, and a closed refrigerant circuit 24. The air stream circuit is formed by the laundry drum 16, an evaporator or gas heater 26, a condenser or gas cooler 28 and a drying air stream fan 30. The refrigerant circuit 24 is formed by a compressor 32, the condenser 28, an expansion device 34 and the evaporator 26. For example, the expansion device 34 is an expansion valve. The evaporator 26 and the condenser 28 are heat exchangers and form the thermal interconnections between the air stream circuit 22 and the refrigerant circuit 24.

[0043] Further, the heat pump system comprises a motor 36 and a control unit 40. The motor 36 is connected to the control unit 40 by a motor control line 44. The drying air stream fan 30 and the laundry drum 16 are driven by the motor 36. The first electrode 12 and the second electrode 14 are arranged inside the laundry drum 16. The first electrode 12 and the second electrode 14 are connected to the control unit 40 by a detection line 42. The first electrode 12, the second electrode 14, the detection line 42 and the control unit 40 form the conductimetric system.

[0044] In the air stream circuit 22, the evaporator 26 cools down and dehumidifies an air stream, after the air stream has passed the laundry drum 16. Then, the condenser 28 heats up the air stream, before the air stream is re-inserted into the laundry drum 16 again. The air stream is driven by the drying air stream fan 30 arranged preferably but not necessarily between the condenser 28 and laundry drum 16. In the refrigerant circuit 24, a refrigerant is compressed and heated up by the compressor 32, cooled down and condensed in the condenser 28, expanded in the expansion device 34 and then vaporised in the evaporator 26.

[0045] The first electrode 12, the second electrode 14, the detection line 42 and the control unit 40 form the conductimetric system for estimating the amount of load inside the laundry drum 16. In dependence of the amount of the load the rotation speed of the motor 36 and thereby the rotation speed of the drying air stream fan 30 and the laundry drum 16 are controlled by the control unit 40. The rotation speed of the drying air stream fan 30 is proportional to the rotation speed of the laundry drum 16. For example, the air stream drying 30 is directly driven by the motor 36, while the laundry drum 16 is indirectly driven by the motor 36 via a belt-pulley system. If the conductimetric system estimates a reduced load in the laundry drum 16, which is lower than the maximum load of said laundry drum 16, then the control unit sets the motor 36 and thereby the drying air stream fan 30 and the laundry drum 16 to a rotation speed higher than the rotation speed for the maximum load. Preferably, the estimation of the load in the laundry drum 16 is performed during the first few minutes of the drying cycle, for example during the first five minutes.

[0046] FIG 5 illustrates a schematic diagram of a second embodiment of the laundry dryer 10 with the heat pump system according to the present invention.

[0047] The heat pump system for the laundry dryer 10 of the second embodiment comprises substantially the same components as the first embodiment. Instead of the motor 36 for driving the drying air stream fan 30 and the laundry drum 16, the second embodiment comprises a fan motor 37 for driving the drying air stream fan 30 and a drum motor 38 for driving the laundry drum 16. Instead of the motor control line 44, the second embodiment comprises a fan control line 45 and a drum control line 46. The fan control line 45 connects the control unit 40 to the fan motor 37. In a similar way, the drum control line 46 connects the control unit 40 to the drum motor 38.

[0048] The conductimetric system includes the first electrode 12, the second electrode 14, the detection line 42 and the control unit 40. If the conductimetric system estimates a reduced load in the laundry drum 16, which is lower than the maximum load of said laundry drum 16, then the control unit sets the fan motor 37 and thereby the drying air stream fan 30 to a rotation speed higher than the rotation speed for the maximum load. Preferably, the estimation of the load in the laundry drum 16 is performed during the first few minutes of the drying cycle, for example during the first five minutes.

[0049] In the second embodiment of the laundry dryer 10 with the heat pump system, the rotation speed of the drying air stream fan 30 and the rotation speed of the laundry drum 16 are independent of each other.

[0050] In both the embodiment shown in figure 4 and 5, the laundry dyer can comprise a variable speed compressor 32 and the control unit 40 is adapted to increase the rotational speed of the compressor motor in response to an increasing of the rotational speed of the drying air stream fan 30.

[0051] FIG 6 illustrates a schematic diagram of a first embodiment of the laundry dryer 10 with an air-to-air condenser 48 according to the present invention.

[0052] The laundry dryer 10 comprises a closed air stream circuit 22 formed by the laundry drum 16, the air-to-air condenser 48, the drying air stream fan 30 and a condenser fan 50. The air-to-air condenser 48 is an air-to-air heat exchanger and forms a thermal interconnection between the air stream circuit 22 and the ambient air. The air-to-air condenser 48 includes two separate channels. A first channel is provided for the air stream of the air stream circuit 22. A second channel is provided for the ambient air. The ambient air is blown through the second channel by the condenser fan 50.

[0053] Further, the laundry dryer 10 comprises the motor 36 and the control unit 40. The motor 36 is connected to the control unit 40 by the motor control line 44. The drying air stream fan 30 and the laundry drum 16 are driven by the motor 36. The first electrode 12 and the second electrode 14 are associated to a rear portion of the front frame 20. Said rear portion of the front frame 20 is substantially arranged face to face with the front opening of the laundry drum 16. The first electrode 12 and the second electrode 14 are connected to the control unit 40 by a detection line 42. The first electrode 12, the second electrode 14, the detection line 42 and the control unit 40 form the conductimetric system.

[0054] The air-to-air condenser 48 cools down and dehumidifies the air stream by ambient air, after the air stream has passed the laundry drum 16. Then, the air stream is heated up by a heating device, for example by an electric heating element, before the air stream is re-inserted into the laundry drum 16 again. The heating device is not shown. The drying air stream is driven by the drying air stream fan 30 arranged between the air-to air condenser 48 and the laundry drum 16.

[0055] If the conductimetric system estimates the reduced load in the laundry drum 16, which is lower than the maximum load of said laundry drum 16, then the control unit sets the motor 36 and thereby the drying air stream fan 30 and the laundry drum 16 to a rotation speed higher than the rotation speed for the maximum load. Preferably, the estimation of the load in the laundry drum 16 is performed during the first few minutes of the drying cycle, for example during the first five minutes.

[0056] FIG 7 illustrates a schematic diagram of a second embodiment of the laundry dryer 10 with the air-to-air condenser 48 according to the present invention.

[0057] The laundry dryer 10 with the air-to-air condenser 48 of the second embodiment comprises substantially the same components as the first embodiment in FIG 6. Instead of the motor 36 for driving the drying air stream fan 30 and the laundry drum 16, the second embodiment comprises a fan motor 37 and a drum motor 38. The fan motor 37 is provided for driving the drying air stream fan 30. The drum motor 38 is provided for driving the laundry drum 16. Instead of the motor control line 46 in FIG 6, the second embodiment comprises a fan control line 45 and a drum control line 46. The fan control line 45 connects the control unit 40 to the fan motor 37. In a similar way, the drum control line 46 connects the control unit 40 to the drum motor 38.

[0058] If the conductimetric system estimates a reduced load in the laundry drum 16, which is lower than the maximum load of said laundry drum 16, then the control unit sets the fan motor 37 and thereby the drying air stream fan 30 to a rotation speed higher than the rotation speed for the maximum load. Preferably, the estimation of the load in the laundry drum 16 is performed during the first few minutes of the drying cycle, for example during the first five minutes.

[0059] In the second embodiment of the laundry dryer 10 with the air-to-air condenser 48 in FIG 7, the rotation speed of the drying air stream fan 30 and the rotation speed of the laundry drum 16 are independent of each other.

[0060] FIG 8 illustrates three diagrams of rotation speeds v of an drying air stream fan 30 as function of the time t according to a first example of the present invention.

[0061] In the beginning of the drying cycle an average rotation speed v of the drying air stream fan 30 is set for a few minutes, for example about five minutes. During this time interval the load inside the laundry drum 16 is estimated. In dependence of the estimated load inside the laundry drum 16 the rotation speed v is set. In FIG 8 three examples of constant rotation speeds v are shown. A lower rotation speed v is provided for the maximum load inside the laundry drum 16. A medium rotation speed v is provided for a reduced load inside the laundry drum 16. A higher rotation speed v is provided for a more reduced load inside the laundry drum 16.

[0062] FIG 9 illustrates three diagrams of rotation speeds v of the drying air stream fan 30 as function of the time t according to a second example of the present invention.

[0063] In the beginning of the drying cycle the average rotation speed v of the drying air stream fan 30 is set for a few minutes, for example about five minutes. During this time interval the load inside the laundry drum 16 is estimated. Then, the rotation speed v is set in dependence of the estimated load inside the laundry drum 16. The three examples of rotation speeds v oscillate around corresponding mean values shown by dashed lines. The lower rotation speed v is provided for the maximum load inside the laundry drum 16. The medium rotation speed v is provided for the reduced load inside the laundry drum 16. The higher rotation speed v is provided for the more reduced load inside the laundry drum 16.

[0064] FIG 10 illustrates a diagram of the rotation speed v of the drying air stream fan 30 as function of the time t according to a third example of the present invention. In this example, the constant rotation speed v of the drying air stream fan 30 is set. The rotation speed v of the drying air stream fan 30 may be coupled to the rotation speed of the laundry drum 16, wherein the rotation speed v of the drying air stream fan 30 is proportional to the rotation speed of the laundry drum 16. Further, the rotation speed v of the drying air stream fan 30 may be independent of the rotation speed of the laundry drum 16.

[0065] FIG 11 illustrates a diagram of the rotation speed v of the drying air stream fan 30 as function of the time t according to a fourth example of the present invention. In this example, the rotation speed v of the drying air stream fan 30 is coupled to the rotation speed of the laundry drum 16, so that the rotation speed v of the drying air stream fan 30 is proportional to the rotation speed of the laundry drum 16. The drying air stream fan 30 and the laundry drum 16 change periodically the sense of rotation.

[0066] FIG 12 illustrates a diagram of the rotation speed of the drying air stream fan as function of the time according to a fifth example of the present invention. In this example, the rotation speed v of the drying air stream fan 30 oscillates around a corresponding mean value shown by the dashed line. Also in this example, the rotation speed v of the drying air stream fan 30 may be coupled to the rotation speed of the laundry drum 16. In this case, the rotation speed v of the drying air stream fan 30 is proportional to the rotation speed of the laundry drum 16. Alternatively, the rotation speed v of the drying air stream fan 30 may be independent of the rotation speed of the laundry drum 16.

[0067] Although illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the present invention is not limited to those precise embodiments, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope or spirit of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

List of reference numerals

[0068]

10	laundry dryer
12	first electrode
14	second electrode

16 laundry drum
17 front free end of laundry drum
18 front door
20 front frame
21 sealing member
22 air stream circuit
24 refrigerant circuit
26 evaporator
28 condenser
30 drying air stream fan
32 compressor
34 expansion device
36 motor
37 fan motor
38 drum motor
40 control unit
42 detection line
44 motor control line
45 fan control line
46 drum control line
48 air-to-air condenser
50 ambient air fan

v rotation speed
t time

Claims

1. A method for controlling a drying cycle of a laundry dryer (10) in dependence of the amount of load inside a laundry drum (16), comprising the steps of:

- detecting an electric resistance and/or an electric conductivity between two or more electrodes (12, 14) at least partly contacting the laundry inside the laundry drum (16) and,
- estimating the amount of load inside the laundry drum (16) by evaluating the noise and/or fluctuation of the detected electric resistance and/or conductivity, and
- controlling a rotation speed (v) of a drying air stream fan (30) for conveying a drying air stream through the laundry drum (16) in response to the estimated amount of load inside the laundry drum (16), wherein the rotation speed (v) of the drying air stream fan increases with a decreasing amount of load in the laundry drum (16).

2. The method according to claim 1,
characterized in, that
the rotation speed (v) of the drying air stream fan (30) increases when the estimated amount of load inside the laundry drum (16) is above a predetermined threshold.

3. The method according to claim 1 or 2,
characterized in, that
a rotation speed of the laundry drum (16) is controlled, wherein the rotation speed of the laundry drum (16) is proportional to the rotation speed (v) of the drying air stream fan (30).

4. The method according to any one of the preceding claims,
characterized in, that
the electric resistance and/or electric conductivity between the electrodes (12, 14) are detected within a predetermined time interval at the beginning of the drying cycle after the laundry drum starts to rotate.

5. The method according to any one of the preceding claims,
characterized in, that
before the amount of load inside the laundry drum (16) has been estimated, the drying air stream fan (30) is driven with an average rotation speed (v).

6. The method according to any one of the preceding claims,
characterized in, that
the drying air stream fan (30) is driven with a constant rotation speed (v), after the amount of load inside the laundry drum (16) has been estimated.

7. The method according to any one of the claims 1 to 5, **characterized in, that**
the drying air stream fan (30) is driven with a rotation speed (v) oscillating around a mean value, after the amount of load inside the laundry drum (16) has been estimated, wherein said mean value depends on the amount of load inside the laundry drum (16).

8. The method according to any one of the preceding claims,
characterized in, that
the drying air stream fan (30) and the laundry drum (16) change periodically the sense of rotation, after the amount of load inside the laundry drum (16) has been estimated.

9. The method according to any one of the preceding claims,
characterized in, that
evaluating the noise and/or fluctuation of the detected electric resistance and/or conductivity comprises:

measuring the value of peaks of an electric signal corresponding to the detected electric resistance and/or conductivity, and/or
measuring the number of peaks within a time span of an electric signal corresponding to the detected electric resistance and/or conductivity, and/or
measuring the area subtended by peaks of an electric signal corresponding to the detected

electric resistance and/or conductivity.

10. The method according to claim 9,
characterized in, that
the number of peaks within a time span of said electric signal increases with a decreasing amount of load in said laundry drum (16).

11. The method according to any one of the preceding claims,
characterized in, that
controlling the speed of a heat pump compressor motor of the laundry dryer (10), wherein the speed of the heat pump compressor motor increases in response to an increasing of the rotation speed (v) of the drying air stream fan (30)

12. A laundry dryer (10) comprising a laundry drum (16), a drying air stream fan (30) for conveying a drying air stream through the laundry drum (16) and

- at least two electrodes (12, 14) provided for detecting an electric resistance and/or an electric conductivity of the laundry inside the laundry drum (16),
- a control unit (40) is provided for estimating the amount of load inside the laundry drum (16) by evaluating electric resistance and/or an electric conductivity, wherein
- the control unit (40) is provided for controlling a rotation speed (v) of the drying air stream fan (30) in response to the estimated amount of load inside the laundry drum (16), and wherein
- the control unit (40) is adapted to drive the drying air stream fan (30) to a first rotation speed corresponding with a first amount of load in the laundry drum (16) and to a second rotation speed corresponding with a second amount of load in said laundry drum (16), wherein the first rotation speed is higher than the second rotation speed and the first amount is smaller than the second amount.

13. The laundry dryer (10) according to claim 12, **characterized in, that**
a motor is provided to drive into rotation both the laundry drum (16) and the drying air stream fan (30).

14. The laundry dryer (10) according to claim 12 or 13,
characterized in, that
the electrodes (12, 14) are arranged at a rear side of a front frame (20) of the laundry dryer (10) and at an opening of said laundry dryer (10).

15. The laundry dryer (10) according to any one of the claims 12 to 14,
characterized in, that
the laundry dryer (10) comprises a heat pump system with a variable speed compressor motor, wherein the control unit (40) is adapted to increase the rotation speed of the variable speed compressor motor in response to an increasing of the rotation speed of the drying air stream fan (30).

FIG 1

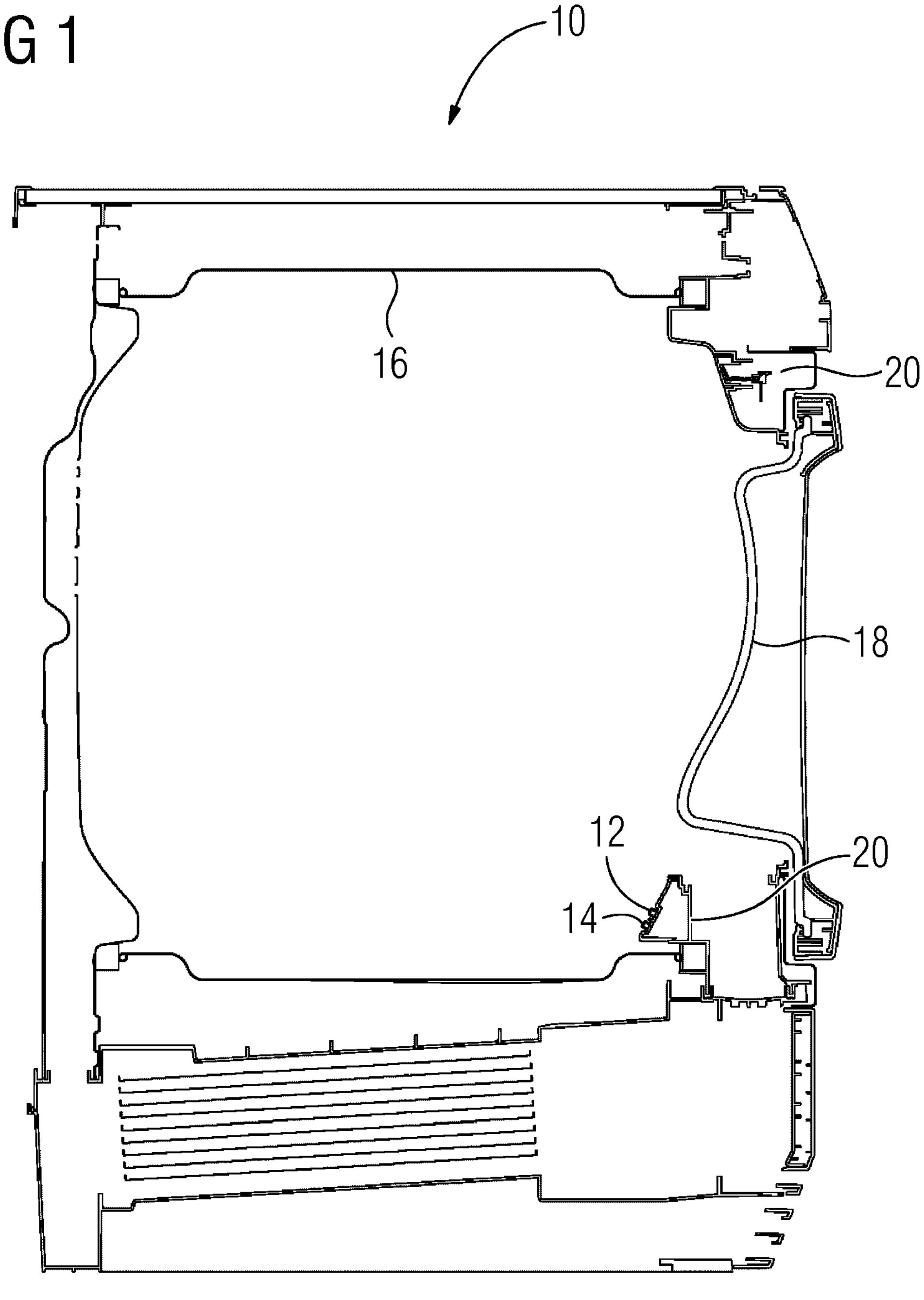


FIG 2

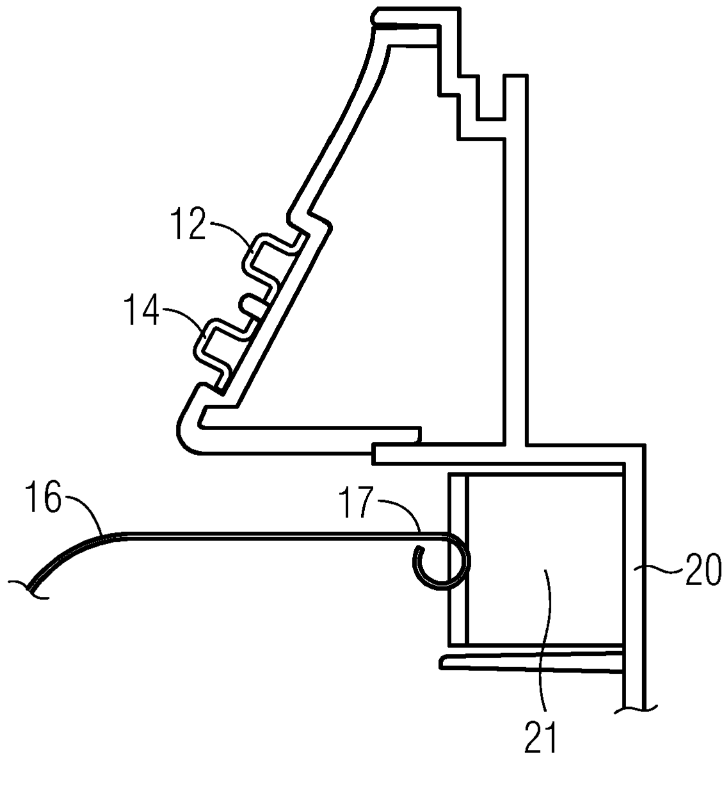
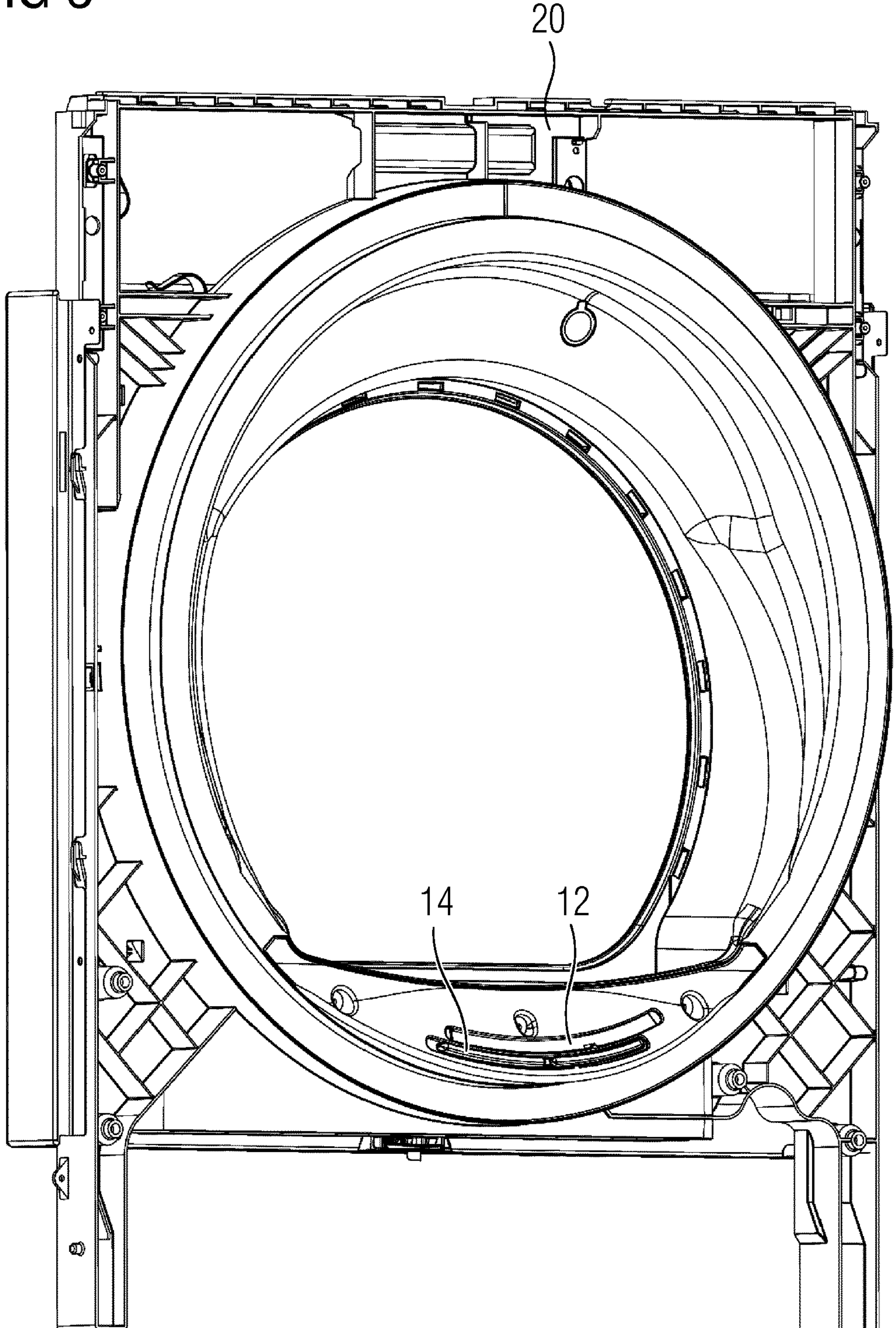


FIG 3



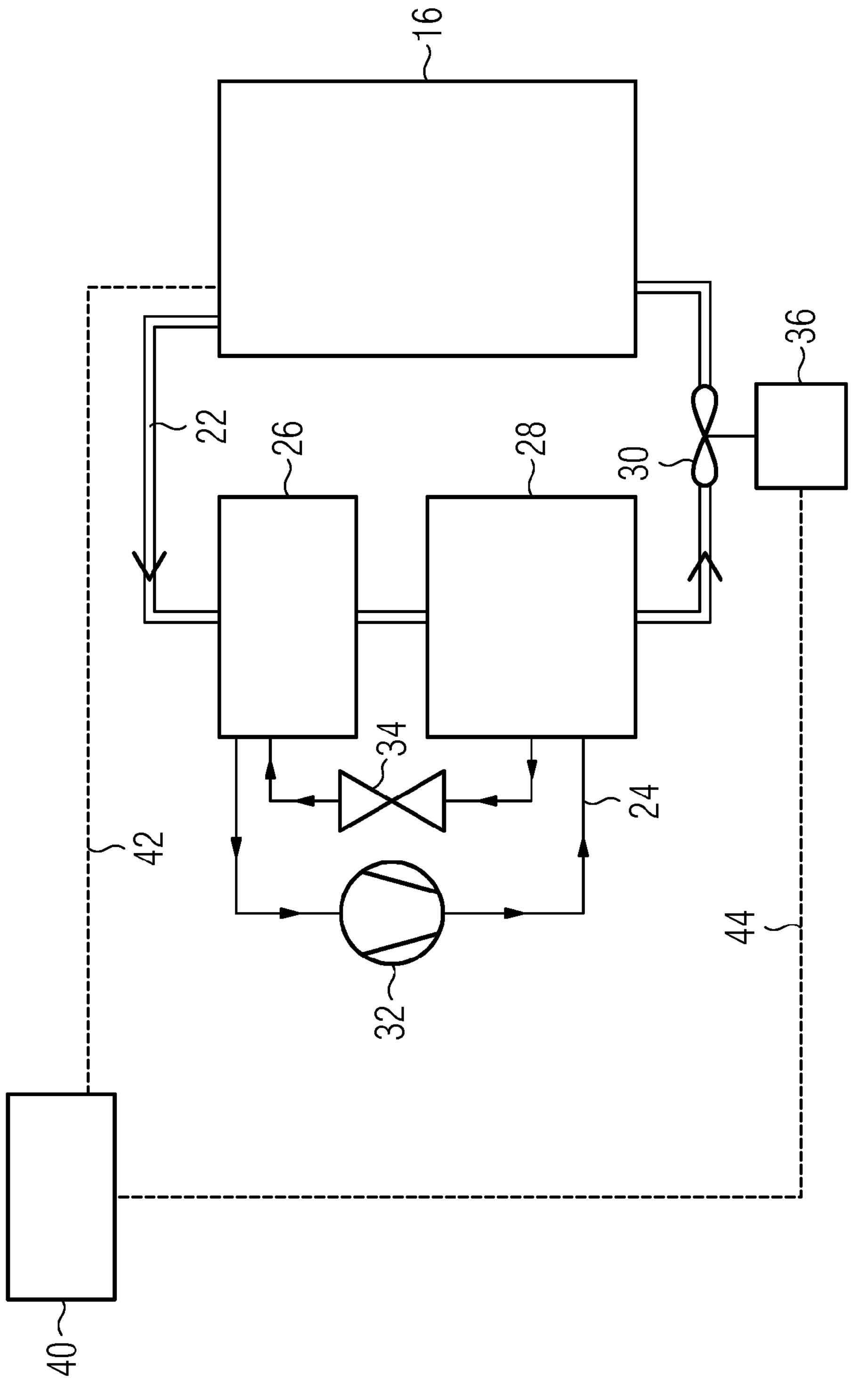


FIG 4

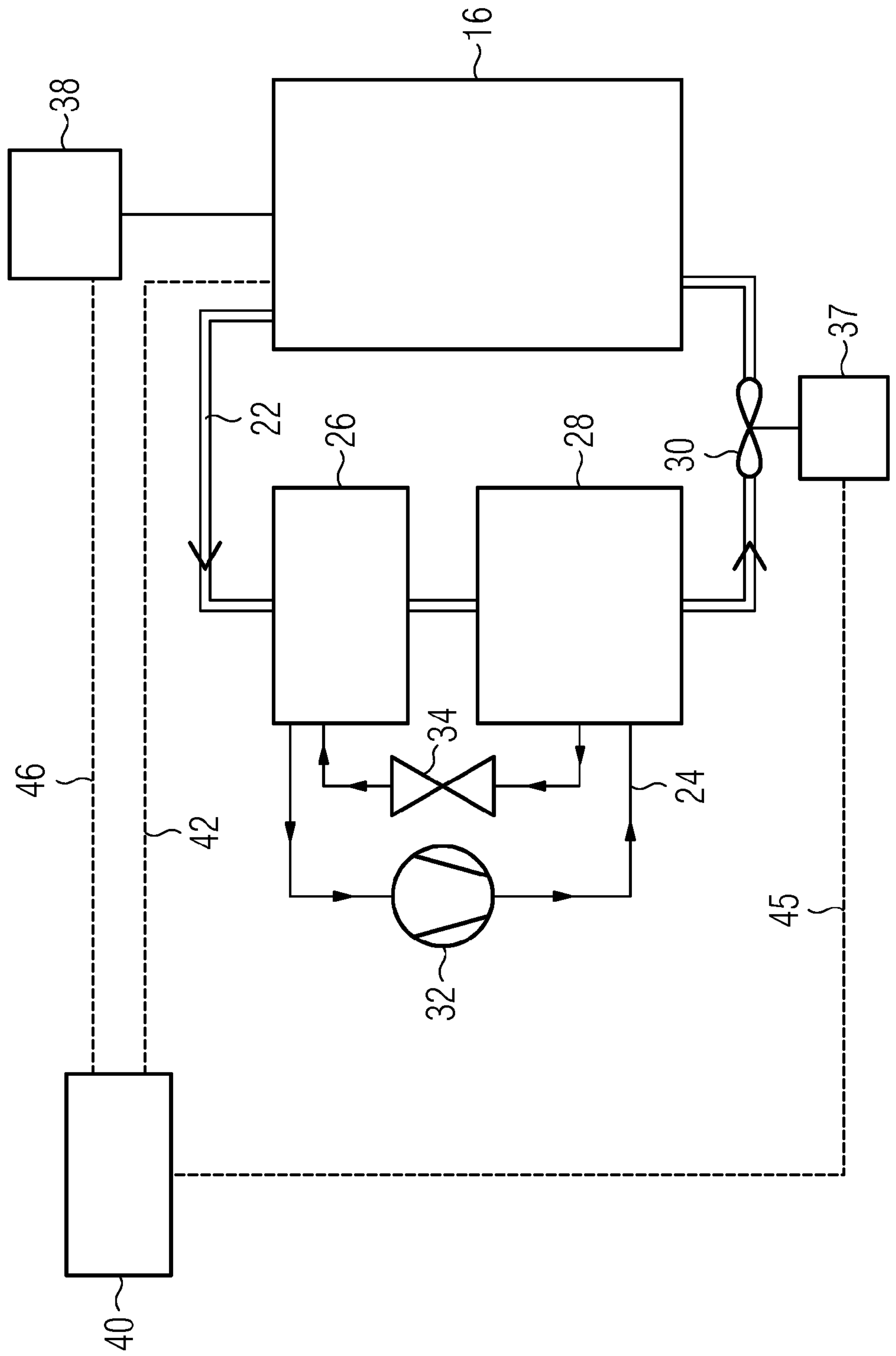


FIG 5

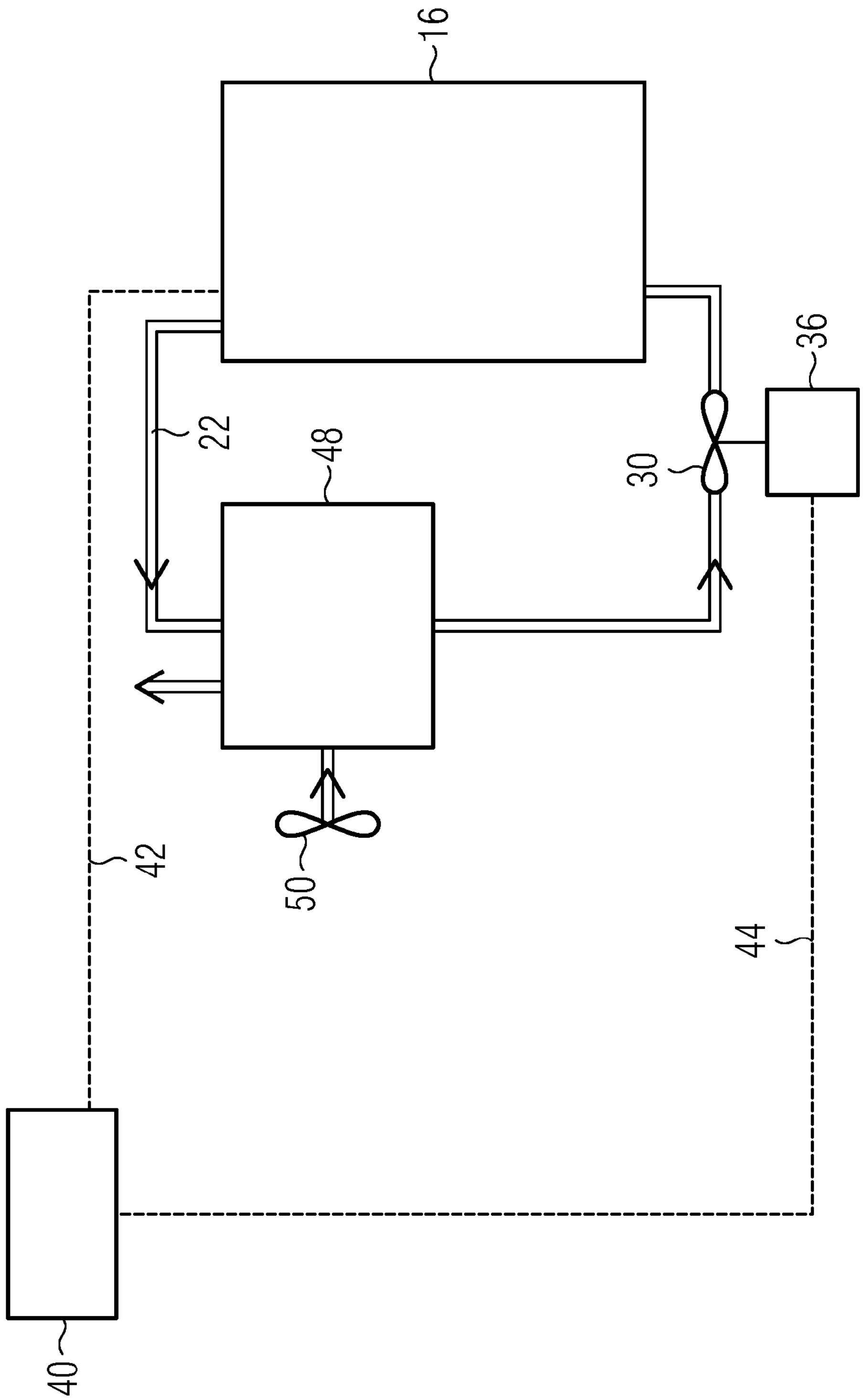


FIG 6

FIG 7

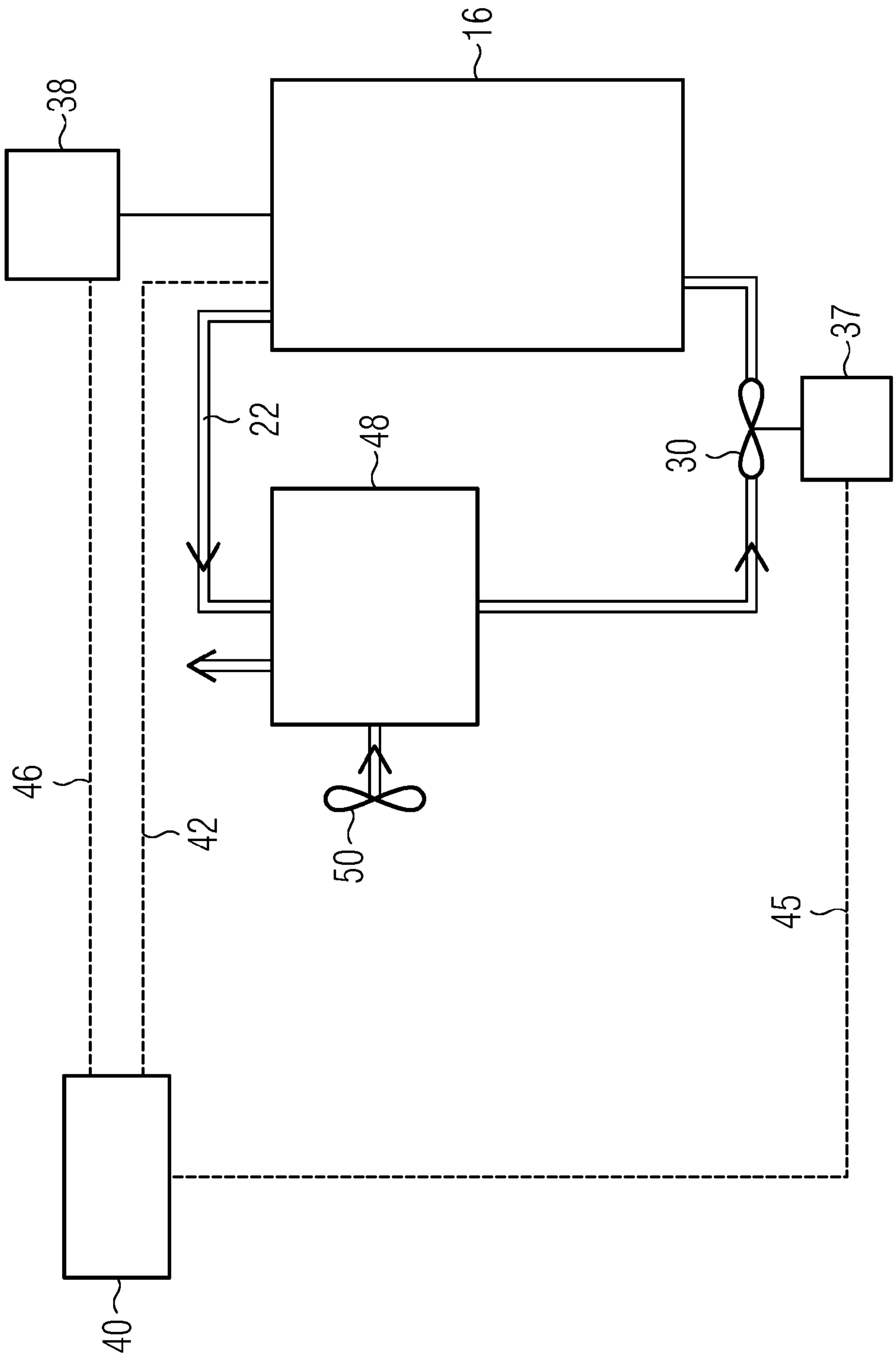


FIG 8

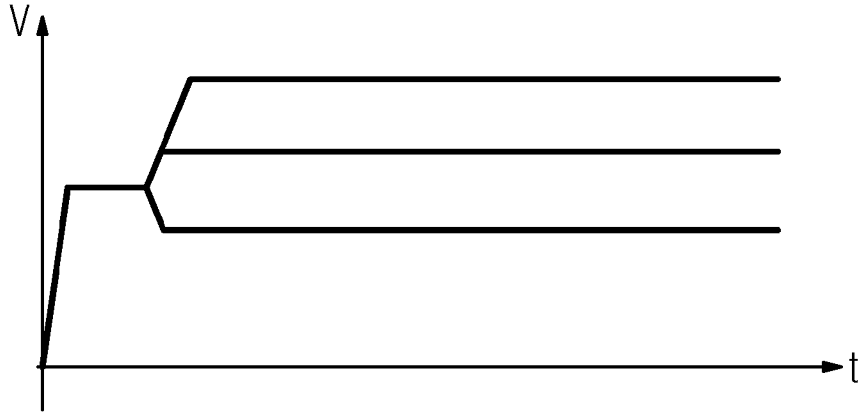


FIG 9

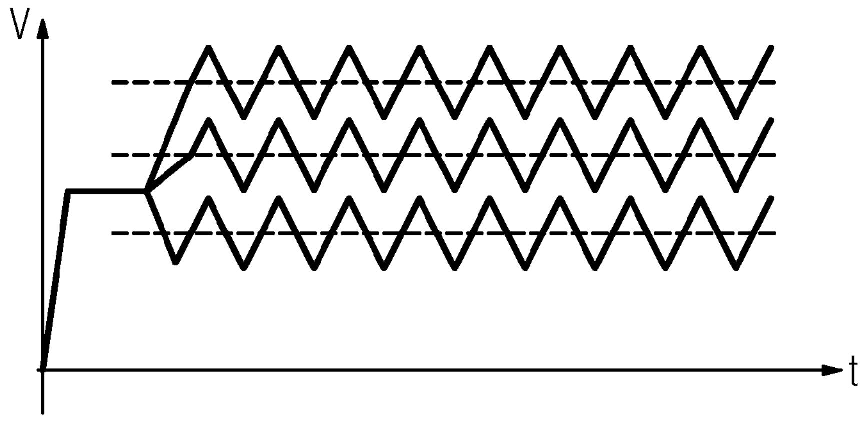


FIG 10

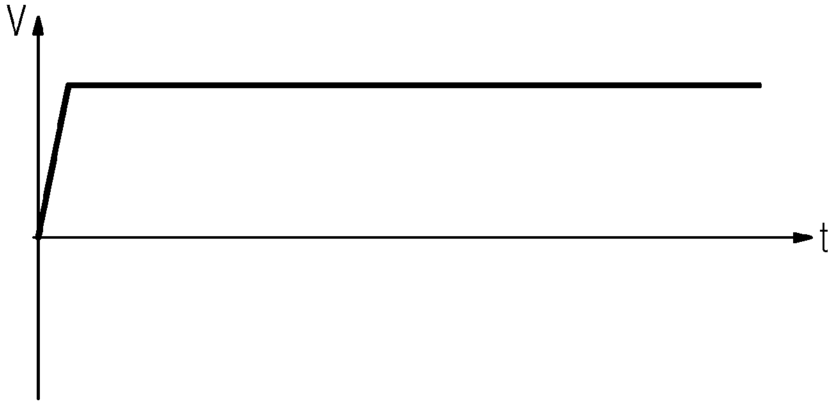


FIG 11

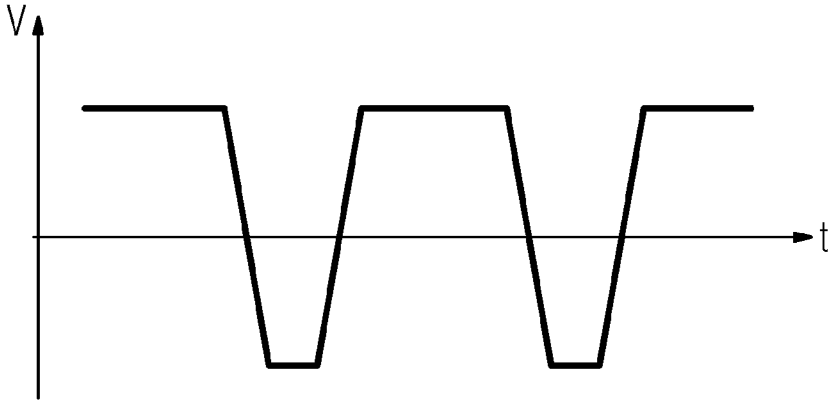
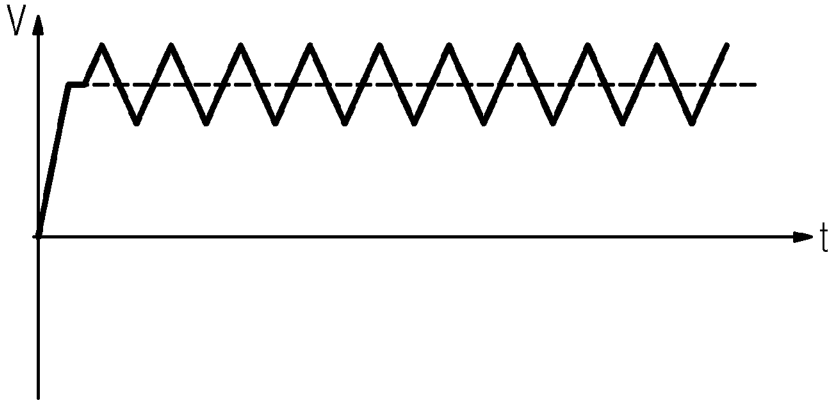


FIG 12



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Application Number
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The present search report has been drawn up for all claims

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Place of search	Date of completion of the search	Examiner
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