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(54) Process to control a steam unit of a domestic appliance

(57) The invention relates to a process to control a steam unit (2) of a domestic appliance (1), which steam unit (2) produces water steam, especially hot or superheated water steam, which is fed to a treatment area (3), especially to a drum, and which steam unit comprises at least one steam generator (4) with a heating element and water supply means to supply water to the steam generator.

The process according to the invention is characterized in that the temperature (24) of the steam generator (4), especially the surface temperature of the steam generator (4) and/or the temperature of the heating element of the steam generator, and/or the temperature of the water steam is measured, and in a normal operation the heating element of the steam generator (4) and/or the water supply means (5) are controlled in such a way that the measured temperature (24) is kept between a given lower temperature limit (30) and a given upper temperature limit (31).

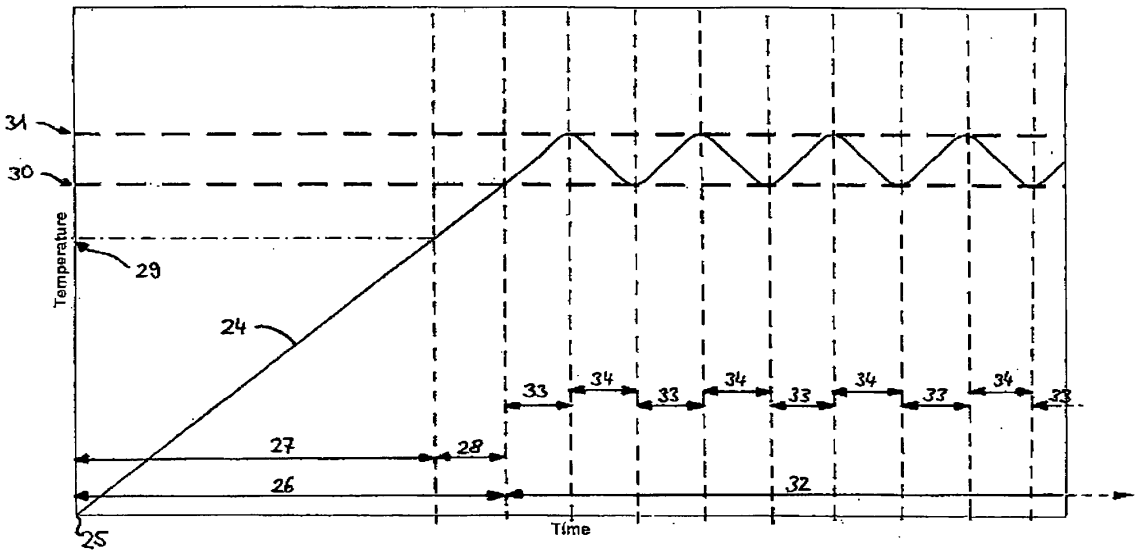

FIG 5

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Description

[0001] The invention relates to a process to control a steam unit of a domestic appliance, especially of a dryer for textiles or of a washing machine.

[0002] Domestic appliances are well known in the state of the art. It is known to wash and to dry textiles by them. Dryers usually use a condensation process or a wet exhausting air process.

[0003] It has been found that the quality of the treatment of textiles can be improved by using steam which is applied to the textiles. This applies especially for washing machines and for dryers. By doing so unwanted odours can be removed. Also a beneficial steam treatment of the textiles can occur. For this purpose water steam, particularly hot or superheated water steam is fed into the treatment area, which is usually a drum which contains the textiles. For this the washing machine or the dryer needs to have a steam unit for the production of steam.

[0004] This steam unit usually is arranged within the domestic appliance. The steam unit at least comprises a steam generator. To produce steam the steam generator needs water. Generally this water is supplied from a water reservoir by means of a pump. Therefore this pump usually is a component of the steam unit. By means of this pump the water volume flow into the steam generator can be controlled. Of course different ways of controlling the water volume flow are possible, e.g. by means of controllable valves.

[0005] Within the steam generator the supplied water is evaporated to produce the steam. This steam produced by the steam generator generally is supplied via a steam tube to an outlet nozzle into the treatment area of the domestic appliance.

[0006] A problem of steam generators in operation is that the produced steam usually contains some waterdrops. During treatment of textiles with this steam this waterdrops get in contact with the textiles and may cause undesirable stains.

[0007] Another problem is that the steam produced by steam generators usually is a steam with varying properties, e.g. temperature and steam volume flow. This might cause damage to sensitive textiles.

[0008] A further problem is that that the intended steam treatment of the textiles might not proceed because of faults within the steam system, e.g. leaky tubes in the water supply system. This might damage the textiles and/or the domestic appliance seriously.

[0009] Therefore, it is an object of the present invention to propose a process to control the steam unit of a domestic appliance, especially of a home dryer or of a washing machine, which allows to avoid the problems mentioned above. In particular a process which leads to an improved steam production of the steam generator is desired, especially a process which produces a steam which is free of waterdrops or at least contains less waterdrops and which has at least almost continuous properties, e.g. temperature and/or steam volume flow. Furthermore particularly a process is desired which allows to detect faults within the steam system, e.g. an inadequate or intermitted water supply, and to respond to these faults.

[0010] This object is achieved by a process according to claim 1. Preferred embodiments are mentioned in the dependent claims.

[0011] The invention relates to a process to control a steam unit of a domestic appliance. This steam unit produces water steam, especially hot or superheated water steam, which is fed to a treatment area, especially to a drum. Furthermore this steam unit comprises at least one steam generator with a heating element and water supply means to supply water to the steam generator. The process is characterized in that the temperature of the steam generator, especially the surface temperature of the steam generator and/or the temperature of the heating element of the steam generator, and/or the temperature of the water steam is measured, and in a normal operation the heating element of the steam generator and/or the water supply means are controlled in such a way that the measured temperature is kept between a given lower temperature limit and a given upper temperature limit.

[0012] This process enables a steam production which produces a steam which is free of waterdrops or at least contains less waterdrops and which has at least almost continuous properties, especially a nearly continuous temperature and/or a nearly continuous steam volume flow. Therefore non or at least less waterdrops come into contact with the steam treated textiles. Accordingly non or at least less undesirable stains are caused.

[0013] Beneficially, the invention suggests that the heating element of the steam generator and/or, the water supply means are controlled in such a way that the measured temperature oscillates between the given lower temperature limit and the given upper temperature limit.

[0014] Furthermore the process can include a start operation. In this start operation the heating element of the steam generator and/or the water supply means are controlled in such a way that the measured temperature reaches the temperature range between the given lower temperature limit and the given upper temperature limit. The start operation is followed by the normal operation.

[0015] Preferably, in the start operation in a first phase which lasts till a given first temperature is reached the heating element of the steam generator is switched on and the water supply means are switched off, and in a second phase which starts when the given first temperature is reached the heating element of the steam generator is switched on and the water supply means supply a given water volume flow to the steam generator, whereby the given water volume flow is a fixed first water volume flow or a volume flow which varies according to the measured temperature in a given first relation.

[0016] Beneficially, the suggested process is characterized in that in the normal operation in a first phase which starts when the given lower temperature limit is

reached and lasts till the given upper temperature is reached the heating element of the steam generator is switched on and the water supply means supply a given water volume flow to the steam generator, whereby the given water volume flow is a fixed second water volume flow or a volume flow which varies according to the measured temperature, in a given second relation. Furthermore in the normal operation in a second phase which starts when the given upper temperature is reached and lasts till the given lower temperature is reached the heating element of the steam generator is switched off or reduced compared to the first phase of the normal operation and the water supply means supply a given water volume flow to the steam generator, whereby the given water volume flow is a fixed third water volume flow or a volume flow which varies according to the measured temperature in a given third relation.

[0017] Whether the normal operation starts with a first phase or a second phase depends on the end temperature of the start operation. If the start operation ends at the given lower temperature limit, the normal operation starts with a first phase as described before. If the start operation ends at the given upper temperature limit, the normal operation starts with a second phase as described before.

[0018] Preferably the fixed second water volume flow equals the third water volume and/or the given second relation and the given third relation are equivalent or equal. It also can be provided that the fixed first water volume flow equals the fixed second and third water volume flow and/or the given first relation and the given second relation and the given third relation are equivalent or equal and/or the given first relation and the given second relation and the given third relation are part of a consistent superior relation between the measured temperature and the volume flow.

[0019] Preferably the volume flow solely depends from the measured temperature and is independent from the active operation or phase.

[0020] Of course the relations have to be adapted to the thermodynamic system used.

[0021] Preferably the water volume flow is low at measured low temperatures and is high at measured high temperatures.

[0022] Beneficially, the given first relation and/or the given second relation and/or the given third relation and/or the superior relation is or are a directly proportional relation between the measured temperature and the volume flow.

[0023] Overall the aforementioned process results in a low tendency to form waterdrops in the produced steam, even if the steam generator works at low temperatures, e.g. near or at the low temperature limit. Furthermore an adequate relation between water volume flow and measured temperature results in a low on-off-frequency of the heating element of the steam generator, especially because of adequate controlling the volume flow before reaching the upper or lower temperature limits. This results in a high quality of the produced steam, e.g. continuous steam properties.

[0024] In a preferred embodiment of the process the given lower temperature limit is in the range of 115°C to 140°C, especially 120°C to 135°C, particularly about 130°C, and the given upper temperature limit is in the range of 140°C to 170°C, especially 145°C to 160°C, particularly about 150°C.

[0025] Beneficially, the mentioned first temperature is equal to or higher than 100°C, especially is in the range of 100°C to 130°C, particularly in the range of 100°C to 115°C.

[0026] Advantageously, the proposed process includes the following steps:

a) measuring the duration of the second phase of the normal operation,
b) comparing this measured duration to a given duration value, and
c) starting a fault operation in case the measured duration diverges more than a given diverge value from the given duration value.

[0027] Alternatively or additionally the process can include the following steps:

a) measuring the frequency of the temperature sequence in the normal operation and/or the frequency of the switching on and off of the heating element of the steam generator in the normal operation,
b) comparing this measured frequency to a given frequency value, and
c) starting a fault operation in case the measured frequency diverges more than a given diverge value from the given frequency value.

[0028] Both aforementioned embodiments allow to detect faults within the steam system, e.g. an inadequate or intermitted water supply, and to respond to these faults. For example an alert and/or an information can be given to the user and/or the service. Furthermore an adequate respond can help to avoid destruction of components of the appliance because of faulty operation.

[0029] The mentioned fault operation can comprise at least one of the following procedures:

a) giving a warning signal, especially displaying a visual warning signal and/or resounding an acoustical warning signal, and/or
b) stopping or interrupting an active working process of the domestic appliance, and/or
c) opening a water supply of a water reservoir, which is located in or at the domestic appliance for receiving water for the steam unit, especially opening a valve, particularly a magnetic valve, arranged to open und close the water supply of the water reservoir, and/or
d) opening an reserve tank, provided in or at the domestic appliance to supply water to the steam unit.

[0030] The water supply means to supply water to the steam generator can be or can comprise a pump. The water volume flow pumped by the pump can be controlled by adjusting the working frequency of the pump and/or the start-up triggering of the pump.

[0031] Alternatively or additionally the water supply means can be or can comprise valves, which are arranged to control the water volume flow.

[0032] The suggested process can be controlled by at least one electronic controlling device provided in or at the domestic appliance. This electronic controlling device can be integrated into the electronic controlling device of the domestic appliance and/or can be connected to the electronic controlling device of the domestic appliance.

[0033] The mentioned domestic appliance can be a dryer for textiles, especially a dryer of the condensation type. The proposed process is also very useful for washing machines, particularly domestic washing machine.

[0034] Of cause all mentioned process parameters can be stored in and can be read out later from at least one of the electronic controlling devices, e.g. for service purposes.

[0035] In the drawings an embodiment of the invention is depicted.

FIG 1 shows schematically in a front elevation an example of a home dryer with a steam unit which can be controlled by a process according to the invention,

FIG 2 shows schematically a top view of the steam unit placed within the dryer shown in FIG 1,

FIG 3 shows another example of a home dryer with a steam unit which can be controlled by a process according to the invention,

FIG 4 shows in an magnification a part of FIG 3 that shows the steam unit module,

Fig 5 shows at time-temperature diagram of a faultless operation of the steam unit of a domestic appliance, e.g. a dryer as it is shown in FIG 1 to FIG 4, and

FIG 6 shows a time-temperature diagram according to FIG 5 and compares a faultless and a faulty operation of the steam unit of a domestic appliance, e.g. a dryer as it is shown in FIG 1 to FIG 4.

[0036] In FIG 1 a domestic appliance 1 in the form of a home dryer for drying textiles is shown wherein the drying of the textiles occurs in a well known manner. The textiles (not depicted) are placed in a drum 3, which is generally a treatment area. The drum 3 is closed by a door 20. Here, the dryer 1 is designed as a dryer of the condensation type. I. e. it has a condensate reservoir 16 in which water is collected which is extracted from the wet textiles.

[0037] To improve the quality of the treatment of the textiles a steam process is carried out in the dryer 1. Steam, i. e. hot or superheated steam, is applied to the textiles in the drum 3 of the dryer 1. For this a modular steam unit 2 for the production of the steam is arranged within the dryer 1. A water reservoir 6 to supply the steam unit is placed in a side region 13 of the dryer 1, in an upper region 14, close to a side panel 17 of the dryer 1 and between the side panel 17 and the condensate reservoir 16. The condensate reservoir 16 is arranged as part of a drawer (not depicted) that could be removed from the dryer 1 to empty it. A front panel 21 of this drawer can be seen in FIG 1. This front panel 21 additionally covers at least a part of the water reservoir 6.

[0038] The steam unit 2 is designed as a compact and modular element. Therefore, the whole steam unit 2 can be assembled or disassembled into or from the dryer 1.

[0039] As can be seen from FIG 1 the steam unit 2 is arranged in the left part, i. e. in the side region 13, of the dryer in a lower region 15, especially between the drum 3 and a side panel 17 of the dryer 1. It is also possible to locate the steam unit 2 in an upper region 14 of the appliance 1.

[0040] Details of the steam unit 2 become apparent from FIG 2. As can be seen here, the steam unit 2 comprises different components, i.e. a steam generator 4 with a heating element, which is supplied with water from the water reservoir 6 by means of a pump 5, which is also arranged within the steam unit 2. Steam generator 4 and pump 5 are fixed on a base plate 11 which is received in receiving means 12 arranged at the dryer 1, which are shown only schematically. It can be seen that this receiving means 12 fit into holes 22 in the base plate 11. The base plate 11 is set on the receiving means 12 via a vertical movement and affixed by an additional horizontal movement, whereby a horizontal groove (not depicted) in the receiving means 12 slides into a corresponding recess 23 in the base plate 11.

[0041] Alternatively different quick releasing means can be provided, which make sure that the base plate 11 carrying the different parts of the steam unit 2 is firmly located in the domestic appliance 1.

[0042] Furthermore, the water reservoir 6 can be arranged as additional part of the modular steam unit 2 (not depicted), e.g. by arranging it on the top of the steam generator 4 and/or the pump 5.

[0043] The steam produced by the steam generator 4 is supplied via a steam tube 18 to an outlet nozzle 19 and into the drum 3.

[0044] Furthermore, it is only depicted schematically that the steam unit 2 has also a safety device 7 and an electronic controlling device 8. Furthermore, an electric wrap connection device 9 is arranged to establish the electrical connection with the controlling device 10 of the dryer 1 (see FIG 1). One part 9' of the electric wrap connection device 9 is fixed on the base plate 11 and another part 9'' of the electric wrap connection device 9 can be

connected with the domestic appliance 1. When inserting the base plate 11 into the domestic device 1 by sliding it in horizontal direction, the electrical connection is achieved automatically, as the two parts 9' and 9" come into contact.

[0045] Alternatively it is possible to use plug connector and socket as electric wrap connection device. In this case the electrical connection between steam unit and controlling device of the dryer can be done by just connecting the connector with the socket.

[0046] The water reservoir 6 allows the storage and the supply of clean and decontaminated water for the steam production. As shown in FIG 1, it is designed in that way that it becomes very small to use a free space between the condensate reservoir 16 and the side panel 17.

[0047] The different components can be fixed on the base plate 11 using several bolts which are arranged on the base plate, e. g. four bolts, which are connected with the components to arrange them firmly to the base plate 11.

[0048] FIG 3 shows another example of a home dryer 1 according to the invention. The side panel is removed, therefore the arrangement of the water reservoir 6 and the steam unit module 2 in the dryer 1 can be seen. FIG 4 shows in a magnification of FIG 3 the arrangement of the steam unit 2. The steam generator 4, the pump 5, the base plate 11 and the receiving means 12 arranged at the dryer 1 to receive the base plate 11 can be seen.

[0049] FIG 5 shows at time-temperature diagram, whereby the time is applied on the x-axis and the temperature is applied on the y-axis. The graph or line 24 shown in this time-temperature diagram illustrates the temperature measured at the surface of the steam generator 4 of the steam unit 2 of a domestic appliance 1. A similar graph would occur if the temperature of the heating element of the steam generator 4 or the temperature of the water steam would be measured and depicted in a time-temperature diagram.

[0050] In this diagram the temporal development of the temperature of a steam generator 4 in operation can be seen. The operation starts at the point of origin 25 with a start operation 26 of the steam unit 2. During this start operation 26 the heating element of the steam generator 4 and the pump 5 are controlled in such a way that the measured temperature 24 reaches a given lower temperature limit 30. Afterwards in a normal operation 32 the measured temperature graph 24 oscillates between this given lower temperature limit 30 and a upper temerature limit 31.

[0051] The start operation 26 is divided into two phases, whereby a second phase 28 follows a first phase 27. The first phase 27 lasts till a given first temperature 29, which is higher than 100°C, is reached. During this first phase 27 the heating element of the steam generator 4 is switched on and the water supply means 5 are switched off. Therefore the steam generator is heated up, the measured temperature graph 24 in FIG 5 rises continuously during the first phase 27 of the start operation 26, but no water flows through the steam generator and therefore during this first phase 27 no or very few steam is produced.

[0052] When the first temperature 29 is reached the first phase 27 of the start operation 26 ends and the second phase 28 of the start operation 26 begins. During the second phase 28 the heating element of the steam generator 4 is switched on and the water supply means 5 supply a given water volume flow to the steam generator, This given water volume flow is a fixed first water volume flow. This first water volume flow can be obtained by controlling the pump 5 with a certain first frequency. Of course alternatively it is possible that the volume flow varies according to the measured temperature in a given first relation. During the second phase 28 of the start operation 26 the steam generator 4 is heated up further on, the measured temperature graph 24 in FIG 5 rises continuously during the second phase 28 of the start operation 26. Furthermore during this second phase 28 of the start operation 26 steam is produced by the steam generator.

[0053] When the measured temperature (graph 24) reaches the lower temperature limit 30 the second phase 28 of the start operation 26 and the start operation 26 itself end and the normal operation 32 starts. During this normal operation 32 the heating element of the steam generator 4 and the water supply means 5 are controlled in such a way that the measured temperature is kept between the given lower temperature limit 30 and the given upper temperature limit 31. The normal operation 32 is composed of a first phase 33 and a second phase 34, whereby first phase 33 and second phase 34 alternate all along the normal operation 32.

[0054] The normal operation 32 starts at the end of the start operation 26, when the measured temperature (graph 24) reaches the lower temperature limit 30. The normal operation 32 starts with a first phase 33. During this first phase 33 of the normal operation 32 the heating element of the steam generator 4 is switched on and the pump 5 supplies a given water-volume flow to the steam generator 4. This given water volume flow is a fixed second water volume flow. This second water volume flow can be obtained by controlling the pump 5 with a certain second frequency. Of course alternatively it is possible that the volume flow varies according to the measured temperature in a given second relation.

[0055] During the first phase 33 of the normal operation 32 the steam generator 4 is heated up, the measured temperature graph 24 in FIG 5 rises during the first phase 33 of the normal operation 32. Furthermore during this first phase 33 of the normal operation 32 steam is produced by the steam generator 4.

[0056] The first phase 33 of the normal operation 32 ends when the upper temperature limit 31 is reached. At this time the second phase 34 of the normal operation 32 starts.

[0057] During this second phase 34 of the normal op-

eration 32 the heating element of the steam generator 4 is switched off and the pump 5 supplies a given water volume flow to the steam generator 4. This given water volume flow is a fixed third water volume flow. This third water volume flow can be obtained by controlling the pump 5 with a certain third frequency. Of course alternatively it is possible that the volume flow varies according to the measured temperature in a given third relation.

[0058] During the second phase 34 of the normal operation 32 the steam generator 4 is cooled down, the measured temperature graph 24 in FIG 5 declines during the second phase 34 of the normal operation 32. Furthermore during this second phase 34 of the normal operation 32 steam is produced by the steam generator 4 further on.

[0059] The second phase 34 of the normal operation 32 lasts till the given lower temperature limit 30 is reached. At this time the next first phase 33 of the normal operation 32 starts. When the upper temperature limit 31 is reached again, in turn the next second phase 34 of the normal operation 32 starts, and so on.

[0060] Because of the described process during the total normal operation 32 steam is produced, whereby this steam is free of waterdrops or at least contains less waterdrops. Furthermore the produced steam has an nearly continuous temperature lying within a temperature range, possibly oscillating between two temperature limits of the temperature range. As well the steam volume flow is nearly continuous,

[0061] In FIG 5 the given lower temperature limit is about 130°C, the given upper temperature limit is about 150°C, the first temperature is about 110°C.

[0062] Alternatively to the previous description it is also possible that the start operation lasts till the upper temperature limit 31 is reached. This means that the second phase of the start operation is longer, it does not end when the lower temperature limit 30 is reached but it ends when the upper temperature limit 31 is reached. Consequently the normal operation again starts at the end of the start operation, which in this case means when the measured temperature reaches the upper temperature limit 31. This implicates that the normal operation is this case starts with a second phase as described before. This second phase ends when the lower temperature limit 30 is reached. At this time the first phase of the normal operation as describes before starts and lasts till the given upper temperature limit 31 is reached. At this time the next second phase of the normal operation starts, and so on.

[0063] FIG 6 again shows a time-temperature diagram according to FIG 5. The measured temperature graph 24 representing a faultless operation as described on the basis of FIG 5 is depicted with a continuous line. Additionally a faulty operation is shown in FIG 6, the corresponding measured temperature graph 35 is depicted with a broken line. The fault might be a leakage in the water supply system, an empty water reservoir, a faulty pump, and so on. In this case the water volume flow into the steam generator 4 is lower than usual and therefore the cooling down of the steam generator, which mainly is caused because of the water volume flow, takes longer.

[0064] This difference in the duration of the second phase 34 of the normal operation 32 is shown in FIG 6. The duration of the second phase 34 in a faultless operation is depicted with arrow 36, the duration of the second phase 34 in a faulty operation is depicted with arrow 37. The faulty duration 37 is much longer than the faultless duration 36. Therefore by measuring the duration of the second phase 34 and by comparing the measured value with a given value or value range it is possible to detect a faulty operation of the steam unit and to start a fault operation.

[0065] Additionally or alternatively it is possible to measure or determine the frequency of the oscillating measured temperature and to compare it with a given value or value range. Also the switching frequency of the heating element of the steam generator can be measured or determined and afterwards used to detect a faulty operation and to start a fault operation.

Reference Numerals

[0066]

1	Domestic appliance
2	Steam unit
3	Treatment area (drum)
4	Steam generator
5	Water supply means, pump
6	Water reservoir
7	Safety device
8	Electronic controlling device
9, 9', 9"	Electric wrap connection device
10	Controlling device
11	Base plate
12	Receiving means
13	Side region
14	Upper region
15	Lower region
16	Condensate reservoir
17	Side panel
18	Steam tube
19	Outlet nozzle
20	Door
21	Front Panel
22	Hole
23	Recess
24	Graph or line showing the measured surface temperature of a steam generator (faultless operation)
25	Point of origin
26	Start operation
27	First phase of the start operation 26
28	Second phase of the start operation 26
29	First temperature
30	Lower temperature limit

31 Upper temperature limit
32 Normal operation
33 First phase of the normal operation 32
34 Second phase of the normal operation 32
35 Graph or line showing the measured surface temperature of a steam generator (faulty operation)
36 Duration of the second phase 34 (faultless operation)
37 Duration of the second phase 34 (faulty operation)

Claims

1. Process to control a steam unit (2) of a domestic appliance (1),

a) which steam unit (2) produces water steam, especially hot or superheated water steam, which is fed to a treatment area (3), especially to a drum, and
b) which steam unit (2) comprises at least one steam generator (4) with a heating element and water supply means (5) to supply water to the steam generator (4),
characterized in that
c) the temperature (24, 35) of the steam generator (4), especially the surface temperature of the steam generator (4) and/or the temperature of the heating element of the steam generator (4), and/or the temperature of the water steam is measured, and
d) in a normal operation (32) the heating element of the steam generator (4) and/or the water supply means (5) are controlled in such a way that the measured temperature (24, 35) is kept between a given lower temperature limit (30) and a given upper temperature limit (31).

2. Process according to claim 1,
characterized in that
the heating element of the steam generator (4) and/or the water supply means (5) are controlled in such a way that the measured temperature (24, 35) oscillates between the given lower temperature limit (30) and the given upper temperature limit (31).

3. Process according to claim 1 or 2,
characterized in that

a) in a start operation (26) the heating element of the steam generator (4) and/or the water supply means (5) are controlled in such a way that the measured temperature (24, 35) reaches the temperature range between the given lower temperature limit (30) and the given upper temperature limit (31), especially the given lower temperature limit (30) or the given upper temperature limit (31), and
b) the start operation (26) is followed by the normal operation (32).

4. Process according to claim 3,
characterized in that

a) in the start operation (26) in a first phase (27) which lasts till a given first temperature (29) is reached the heating element of the steam generator (4) is switched on and the water supply means (5) are switched off,
b) in the start operation (26) in a second phase (28) which starts when the given first temperature (29) is reached the heating element of the steam generator (4) is switched on and the water supply means (5) supply a given water volume flow to the steam generator (4), whereby the given water volume flow is a fixed first water volume flow or a volume flow which varies according to the measured temperature (24, 35) in a given first relation.

5. Process according to at least one of claims 1 till 4,
characterized in that

a) in the normal operation (32) in a first phase (33) which starts when the given lower temperature limit (30) is reached and lasts till the given upper temperature limit (31) is reached the heating element of the steam generator (4) is switched on and the water supply means (5) supply a given water volume flow to the steam generator (4), whereby the given water volume flow is a fixed second water volume flow or a volume flow which varies according to the measured temperature (24, 35) in a given second relation, and
b) in the normal operation (32) in a second phase (34) which starts when the given upper temperature (31) is reached and lasts till the given lower temperature (30) is reached the heating element of the steam generator (4) is switched off or reduced compared to the first phase (33) of the normal operation (32) and the water supply means (5) supply a given water volume flow to the steam generator (4), whereby the given water volume flow is a fixed third water volume flow or a volume flow which varies according to the measured temperature (24, 35) in a given third relation.

6. Process according to claim 5,
characterized in that
the fixed second water volume flow equals the third water volume flow, and/or
the given second relation and the given third relation

are equivalent or equal.

7. Process according to claim 4 and to claim 6,
characterized in that
the fixed first water volume flow equals the fixed second and third water volume flow and/or
the given first relation and the given second relation and the given third relation are equivalent or equal and/or the given first relation and the given second relation and the given third relation are part of a consistent superior relation between the measured temperature and the volume flow.

8. Process according to at least one of the claims 4 till 7,
characterized in that
the given first relation and/or the given second relation and/or the given third relation and/or the superior relation is/are a directly proportional relation between the measured temperature and the volume flow.

9. Process according to at least one of the claims 1 till 8,
characterized in that

a) the given lower temperature limit (30) is in the range of 115°C to 140°C, especially 120°C to 135°C, particularly about 130°C, and
b) the given upper temperature limit (31) is in the range of 140°C to 170°C, especially 145°C to 160°C, particularly about 150°C.

10. Process according to at least one of the claims 1 till 9 and according to claim 4,
characterized in that
the first temperature (29) is equal to or higher than 100°C, especially is in the range of 100°C to 130°C, particularly in the range of 100°C to 115°C.

11. Process according to at least one of the claims 1 till 10,
characterized in that

a) the duration (36, 37) of the second phase (28) of the normal operation (26) is measured,
b) this measured duration (36, 37) is compared to a given duration value, and
c) in case the measured duration (36, 37) diverges more than a given diverge value from the given duration value a fault operation is started.

12. Process according to at least one of the claims 1 till 11,
characterized in that

a) the frequency of the temperature sequence (33 and 34) in the normal operation (32) and/or the frequency of the switching on and off of the heating element of the steam generator (4) in the normal operation (32) is measured,
b) this measured frequency is compared to a given frequency value, and
c) in case the measured frequency diverges more than a given diverge value from the given frequency value a fault operation is started.

13. Process according to claim 11 or claim 12,
characterized in that
the fault operation comprises at least one of the following procedures:

a) giving a warning signal, especially displaying a visual warning signal and/or resounding an acoustical warning signal, and/or
b) stopping or interrupting an active working process of the domestic appliance, and/or
c) opening a water supply of a water reservoir (6), which is located in or at the domestic appliance (1) for receiving water for the steam unit (2), especially opening a valve, particularly a magnetic valve, arranged to open und close the water supply of the water reservoir (6), and/or
d) opening an reserve tank, provided in or at the domestic appliance (1) to supply water to the steam unit (2).

14. Process according to at least one of the claims 1 till 13,
characterized in that
the water supply means (5) to supply water to the steam generator is or comprises a pump (5).

15. Process according to claim 14,
characterized in that
the water volume flow pumped by the pump (5) can be controlled by adjusting the working frequency of the pump (5) and/or the start-up triggering of the pump (5).

16. Process according to at least one of claims 1 till 15
characterized in that
it is controlled by at least one electronic controlling device (8, 10) provided in or at the domestic appliance (1).

17. Process according to claim 16,
characterized in that
the electronic controlling device (8) is integrated into the electronic controlling device (10) of the domestic appliance (1) and/or is connected to the electronic controlling device (10) of the domestic appliance (1).

18. Process according to at least one of claims 1 till 17
characterized in that
domestic appliance (1) is a dryer for textiles, especially a dryer of the condensation type, or a washing machine

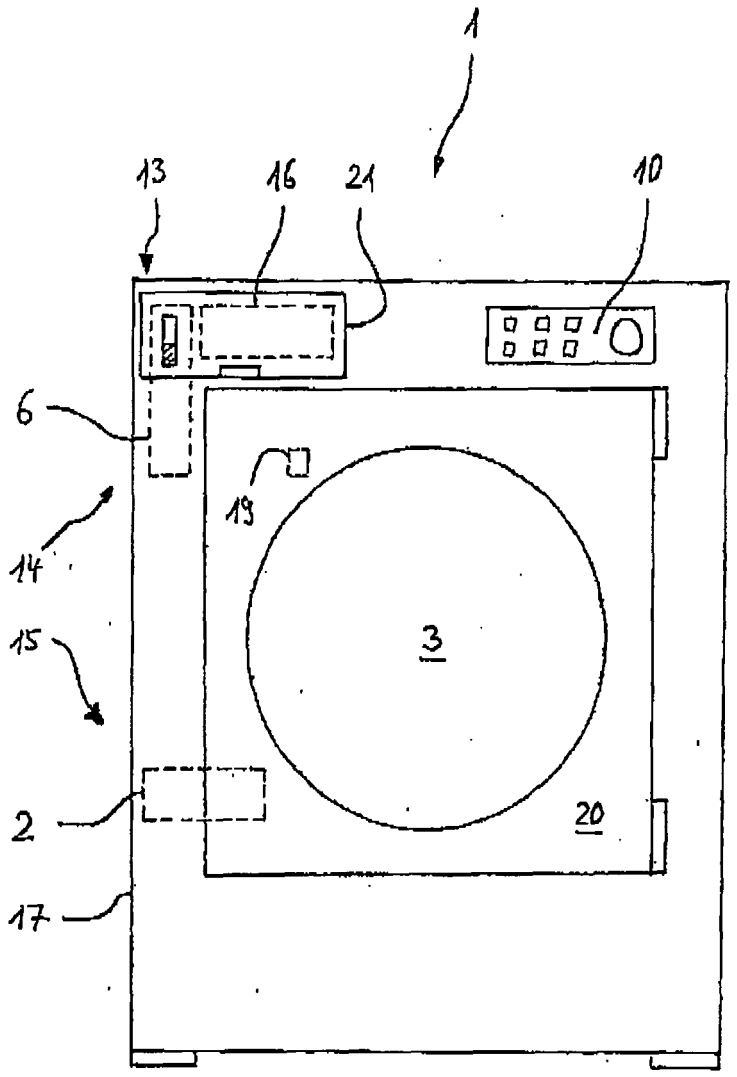

FIG 1

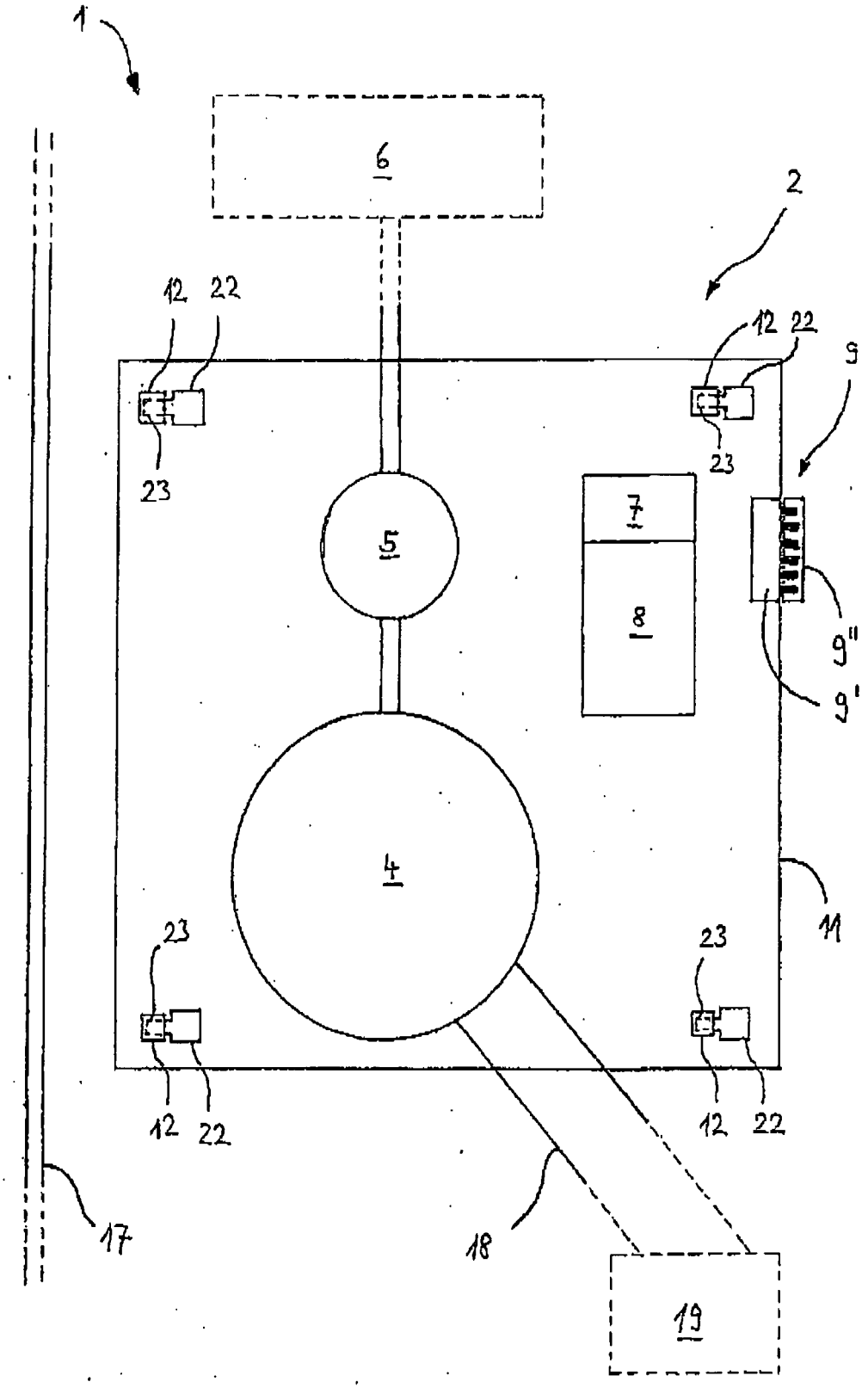

FIG 2

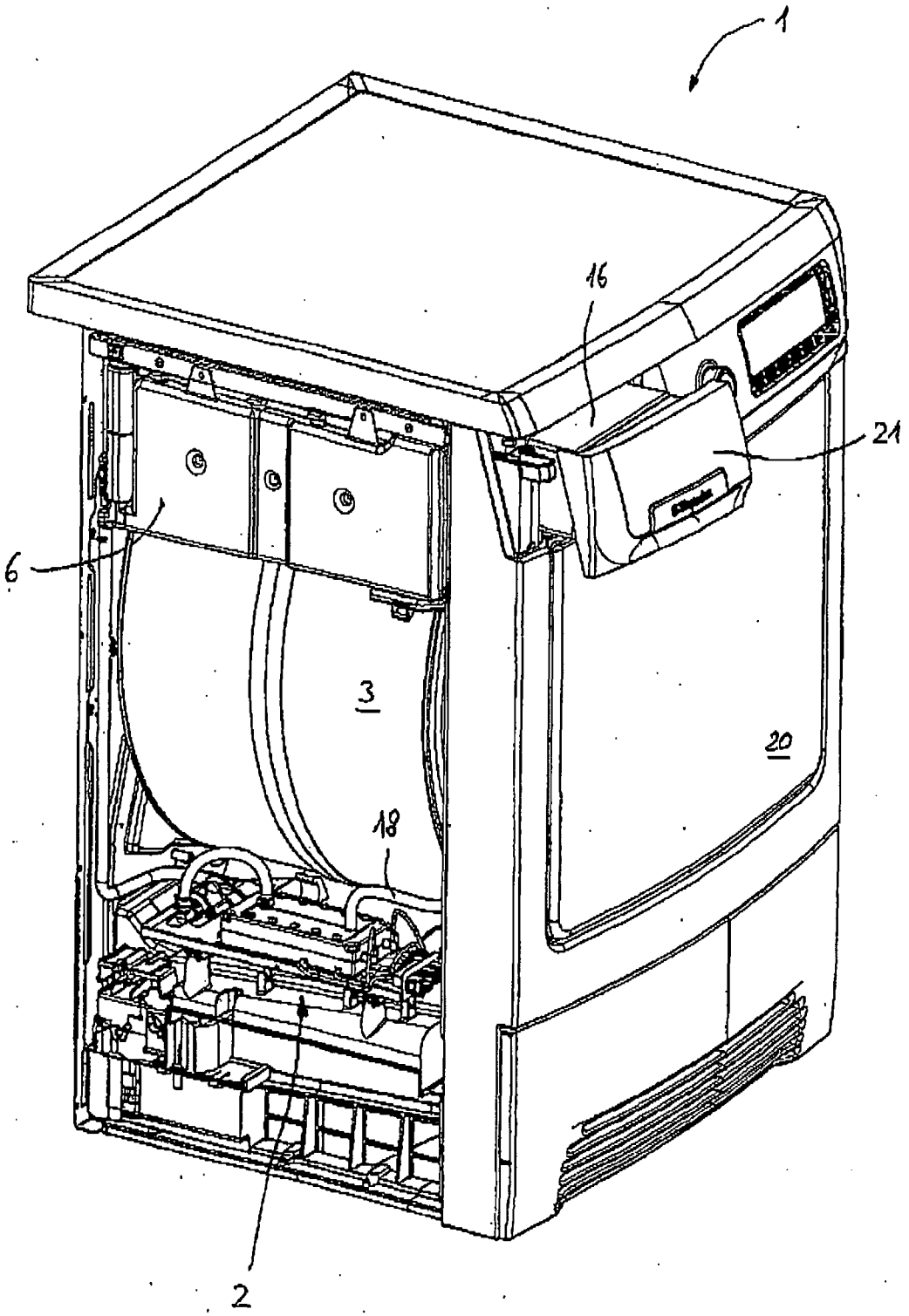

FIG 3

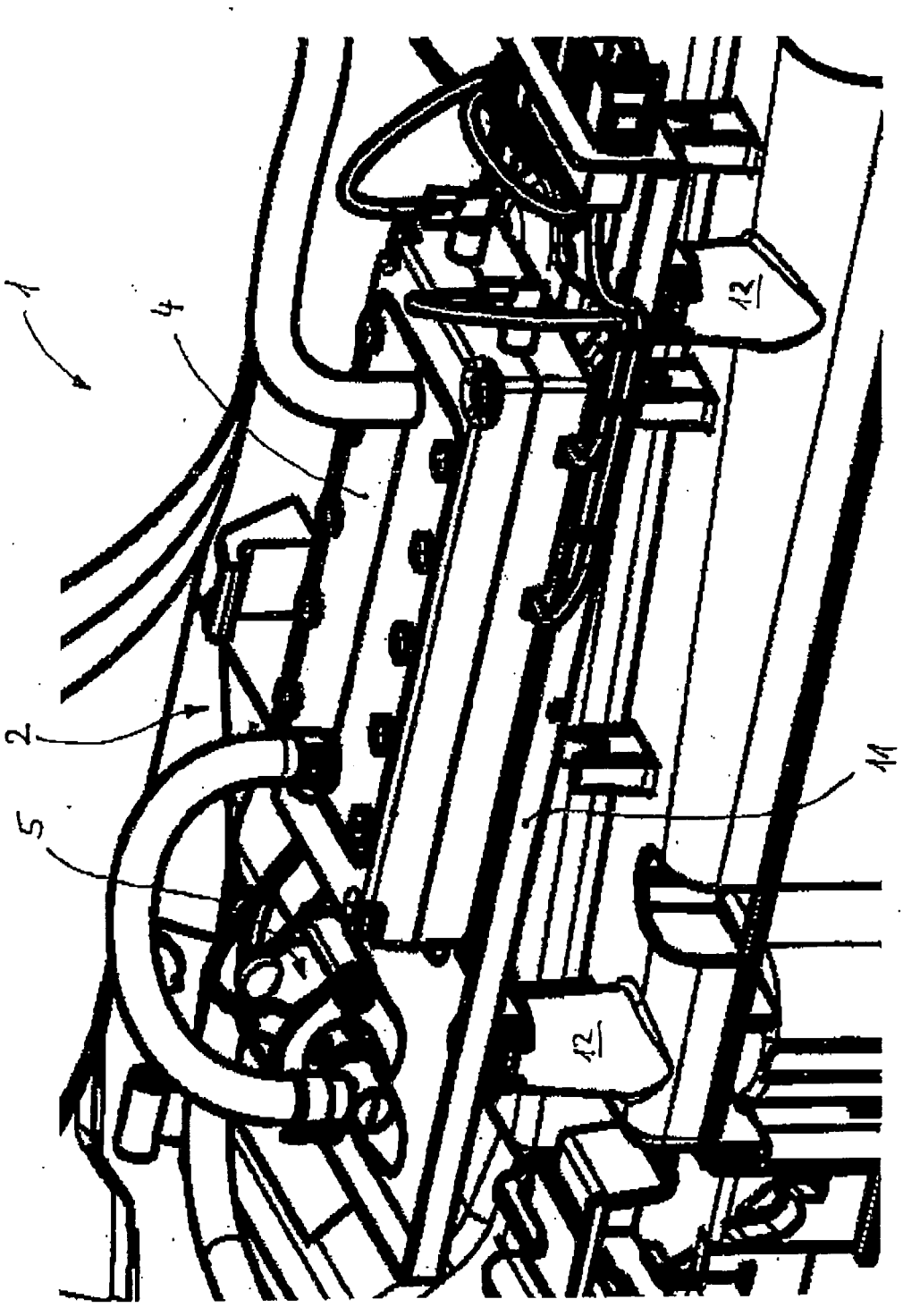

FIG 4

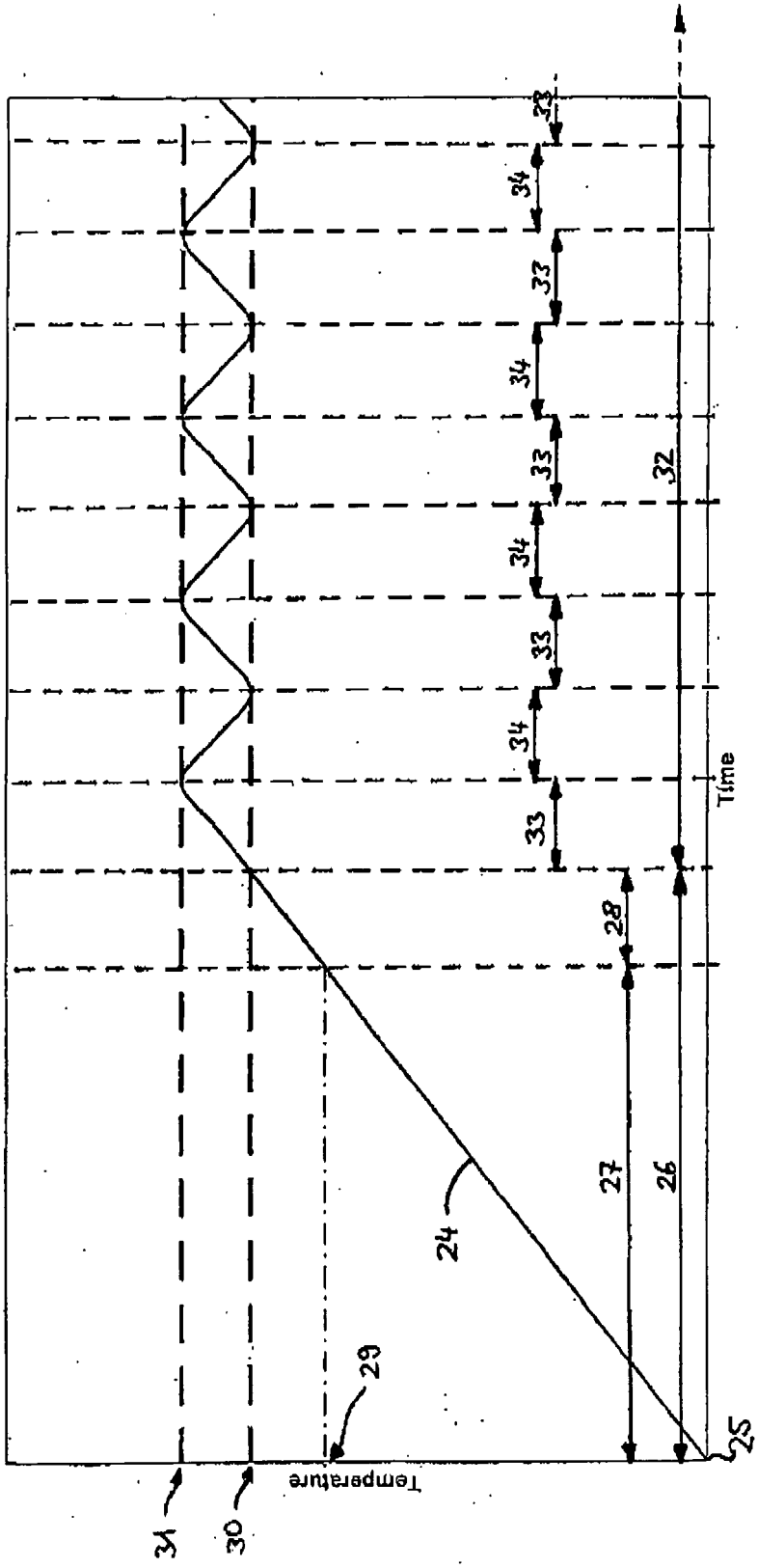

FIG 5

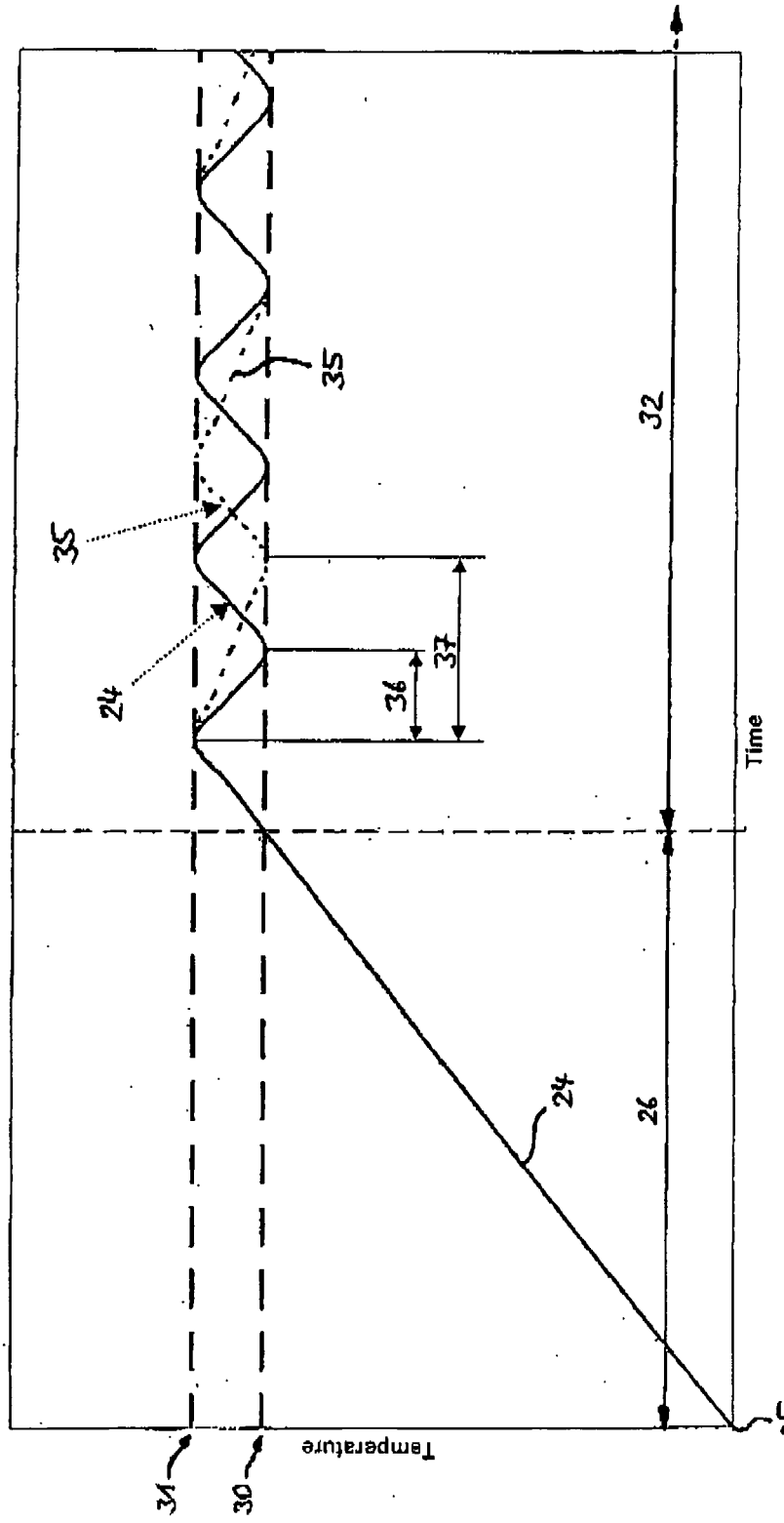

FIG 6

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

Place of search	Date of completion of the search	Examiner
Munich	19 June 2007	Lepers, Joachim

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