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(54) **A METHOD FOR DRYING WASHED DISHES, AND A DEVICE FOR ITS IMPLEMENTATION**

VERFAHREN ZUM TROCKNEN GESPÜLTEN GESCHIRRS UND VORRICHTUNG ZU SEINER
DURCHFÜHRUNG

PROCEDE POUR SECHER DE LA VAISSELLE LAVEE ET DISPOSITIF CORRESPONDANT

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• **PATENT ABSTRACTS OF JAPAN vol. 1998, no.
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Description

TECHNICAL AREA

[0001] The present invention relates to an adaptive method for drying heated dishes in a household dish washing machine by means of expulsion of damp air from the dish area.

[0002] The present invention also relates to a device which carries out said adaptive method.

TECHNICAL BACKGROUND

[0003] Many households today use some kind of dishwasher. A dishwasher operates automatically according to a predefined control program which, inter alia, controls the opening and closing of one or several inlet valves for the supply of water, and which also controls the circulation of this water with a dose added by the user in advance of some sort of detergent which is dissolved in the dishwasher for flushing cleaning of dishes which have been placed in the dishwasher. The circulated water is either warm water which is supplied from a piping system, or alternatively, the supplied water is heated in the dishwasher. A number of flushing processes take place in which old water is pumped out, following which new water is supplied and circulated.

[0004] Many modern dishwashers are equipped with means for drying damp dishes, which immediately following the cleaning process are in a humidified atmosphere. The drying is most often done by means of a fan, which fan expels the humidified air out of the dishwasher and transfers it to the ambient atmosphere. In so doing, ambient atmosphere is supplied to the dishwasher so that an exchange of air takes place, which causes the humidity which in the form of liquid is in direct contact with the dishes to vaporize and be transferred to the ambient atmosphere.

[0005] US 5076306 describes a circulation system for the drying of an object in a dishwasher. A fan drives air from an air intake to an air outlet.

[0006] In many cases the drying time is controlled, that is the time that the fan is to be operational, by a predefined value which is independent of the amount of dishes and the success of the drying process. A fixed value of the time which the drying process is to be operational in most cases means that it is carried out during too long or too short a time. If it is carried out too short a time, the washed dishes will not be dry enough. If, on the other hand, the drying process is carried out during too long a time, there is an unnecessary energy consumption to operate said fan during a too protracted drying process. This also causes the total drying process to go on during an unnecessarily long time.

[0007] For this reason, dishwashers have been equipped with one or several sensors, preferably of the humidity sensor or temperature sensor kind. These sensors continuously detect the development of the process,

and at a certain stage of this development the drying process is interrupted, that is the fan is turned off.

[0008] In many cases the ventilation process is combined with drying by means of heating of the air by means of heating elements.

[0009] JP 10-258014 describes how a humidity sensor is used inside of a dishwasher. The humidity content is detected as the time for a drying process elapses. The drying process is carried out by means of a fan. Either the drying process is interrupted when the humidity content has reached a certain predetermined value, or when the change in humidity content over time planes out.

[0010] EP-A2-1127532 describes a dishwasher including a fan which takes moist air out of the tank through a removal duct and mixes it with dry ambient air taken in through an opening before discharging it through an outlet.

[0011] EP-A1-0521815 describes a dishwasher with a washing compartment which can be closed by means of an appliance door, a vent or the like for the dishwasher container in the appliance door which vent connects the washing compartment to the ambient air, and a mixing chamber for removal of the moist air from the washing compartment when the dishes are being dried, a separate fresh air duct opens out into the mixing chamber.

SUMMARY OF THE INVENTION

[0012] A main purpose of the present invention is to provide a method and a device for controlling a drying process in a household dishwasher, with the humidity content of the ambience taken into consideration.

[0013] This object is obtained by means of an adaptive method according to the present invention, which comprises the steps of initiating the expulsion of the humid air, detecting the ambient humidity content which results in a first value, storing this first value of the humidity content, and that the humidity content of the expelled air is detected, which expelled air continuously will have a lower and lower value of its humidity content. The method finally comprises the step of interrupting the drying process when the value of the humidity content of the expelled air reaches a value which has a predetermined ratio to the stored first value of the ambient humidity content.

[0014] Said purpose is also obtained by means of a device according to appended claim 10.

[0015] In a preferred embodiment, said household machine is a dishwasher.

[0016] By means of this method and the corresponding device, an adaptive control of the drying process is obtained which in its design is simple, and thus reliable and cost efficient.

[0017] Other preferred embodiments of the present invention will become evident from the dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The invention will in the following be described

in connection to examples of preferred embodiments and the appended drawings, in which

- Fig. 1 is a partially cut schematic front view of a dishwasher according to the present invention;
- Fig. 2 is a partially opened schematic side view of a dishwasher according to the present invention; and
- Fig. 3 is a schematic description of the drying process according to the present invention.

PREFERRED EMBODIMENTS

[0019] In the following, a preferred embodiment will be described. It will relate to a dishwasher for household purposes.

[0020] With reference to Fig. 1 and Fig. 2, a dishwasher 1 according to this example of an embodiment is equipped with means for drying the damp dishes in the washing area 2, which dishes immediately following the cleaning process are in a humid atmosphere. The drying is, in brief, done by means of a fan 3 starting, which fan 3 expels the humid atmosphere out of the washing area 2, and transfers it to the ambient atmosphere via an air outlet 4. In so doing, ambient atmosphere is transferred to the washing area 2 via another opening (not shown), so that an exchange of air takes place which causes the humidity, which in the form of liquid is in contact with the dishes to evaporate, and be transferred to the ambient atmosphere.

[0021] According to the present invention, there is arranged, inter alia, a number of canals, and said fan 3 in a door 5 belonging to the dishwasher 1. A first canal 6 leads from the ambient atmosphere to the fan 3, a second canal 7 (see Fig. 1) leads from the washing area 2 of the dishwasher to the fan 3, and a third canal 8 leads from the fan 3 to the ambient atmosphere via the air outlet 4. A valve 9, the design of which will be described in more detail later, during the washing process blocks the passage between the second canal 7 and the fan 3, and thus also between the second canal 7 and the other two canals 6, 8. The other canal 7 is in connection with the washing area 2 via an opening 10.

[0022] With special reference to Fig. 1, the valve function will now be described. The valve 9 consists of a moveable element 11, which in its closed end position is biased by a spring 12 and blocks the passage of air between the second canal 7 and the fan 3. The moveable element 11 is connected to a so-called wax engine 13, which is arranged to move the moveable element 11 from the closed end position against the spring force when it is biased with a suitable tension. The voltage supply to the wax engine 13 is symbolized by a connection 14 which leads to a power supply 15 which in turn is connected to a control unit 16. The connections between the power supply 15 and the control unit 16 are in the figures

symbolized by a connection 17.

[0023] The function of the wax engine 13 is previously known, and is only described here summarily for the sake of clarity. A resistor (not shown) comprised in the wax engine 13 develops heat when it is exposed to a voltage. A certain amount of wax (not shown), partially enclosed in a container 18, then expands, and said amount of wax is so arranged that it then via a power transferring organ 19 presses on the previously mentioned moveable element 11 towards the biasing spring force, so that the valve 9 is opened. The open position remains as long as the wax is heated and thus is in an expanded state. When the voltage is removed from the resistor, the resistor cools off, causing the amount of wax to return to its earlier contracted shape. Said power transferring organ 19 then also returns, with the spring force causing also the moveable element 11 to return, causing the valve 9 to be closed. An important detail in this context is that there is a certain time delay from the moment when the voltage is applied to the resistor until the wax has been heated and expanded so much that the valve 9 has been opened. In a corresponding manner, there is a delay from the removal of the voltage from the resistor until the wax has cooled off and contracted to a degree where the valve 9 is closed. In a preferred embodiment, this time delay is approximately 30 seconds.

[0024] We will now return in the description both to Fig. 1 and Fig. 2, in a state where the cleaning process is finished and the drying process is just about to begin. All of the program steps for these processes are controlled by the earlier mentioned control unit 16 arranged in the dishwasher 1. Voltage is now applied to the fan 3, the voltage feeding to the fan 3 symbolized by means of a connection 20 which leads to the power supply 15. The fan 3 starts at the same time as voltage is applied to the wax engine 13 (not shown in Fig. 2), whose valve opening process starts. At this stage, air will be transported into the first canal 6 at the area A from the ambient atmosphere via an air intake 21 through the first canal 6 to the fan 3 and further along through the third canal 8 and back out into the ambient atmosphere at point B via the air outlet 4. In Figs. 1 and 2, said air intake 21 is shown to be arranged at the upper edge of the door 5, but this is merely an example of the placement of such an air intake and should not be seen as a limitation. Downstream from the fan 3 but upstream from the air outlet 4, there is in the third canal 8 a humidity sensor 22 arranged, which humidity sensor 22 preferably is of the capacitive kind, and which as such is previously known.

[0025] It can be noted that such a capacitive humidity sensor is fed by means of direct current, and delivers an output signal within a certain frequency interval, where the frequency is proportional to the relative humidity content. The humidity sensor 22 detects, preferably but not exclusively, a relative humidity content in the interval of 10%-95%. The rest of the function of the humidity sensor will not be described here.

[0026] The connection to the humidity sensor 22 is

symbolized by a connection 23 which leads to the control unit 16. This humidity sensor 22 at this stage detects the humidity content which results in a humidity value, for example by means of a number of measured values being sampled and filtered. This value in principle corresponds to the humidity content of the ambient atmosphere, since the humid air in the washing area 2 has not yet had access since the valve 9 is closed. This first value is stored. The wax engine 13 opens the valve 9 after said time delay, and the humid air in the washing area 2, led into the second canal 7 by means of the opening 10, is led further on through the second canal 7 to the fan 3 where it is mixed with the ambient atmosphere which is led to the fan 3 via the first canal 6. The mixture of the humid air with the ambient atmosphere causes the amount of vapour of the humid air to decrease, which is desirable from a user's point of view. The mixture is led further down through the third canal 8. The third canal 8 opens into the air outlet 4, which preferably is placed at the lower edge of the door 5 where the mixed air which is blown out will not be noticed very much by the user. There, the blown-out air mixture is led out in such a manner that the exhaust is primarily horizontal (see in particular Fig. 2). Another advantage of leading the expelled air mixture to the lower edge of the door 5 is that when said air mixture travels through the third canal 8, said air mixture is cooled, which further reduces the amount of steam. After the detection by the humidity sensor 22 of the humidity content of the ambient atmosphere, it takes a certain time before it again starts to detect the humidity content, which will be described in more detail below. After a predetermined time, the humidity sensor 22 again begins to detect the humidity content. When the humidity content after a certain amount of time reaches a detected value which has a certain predetermined relationship to the first stored value, the drying process is interrupted. The drying process, as described above, functions in an adaptive manner since it is adapted to the current surrounding humidity content at the time in question.

[0027] The drying process is schematically shown in Fig. 3. At the time to a value is obtained of the humidity content of the ambient atmosphere F_0 . After a predetermined time t_1 the humidity sensor again begins to detect the humidity content. When the humidity content after a certain amount of time t_2 reaches a detected value F_2 which has a certain predetermined relationship to the first stored value F_0 , the drying process is interrupted.

[0028] This relationship can for example be such that the first stored value F_0 is divided by a predetermined factor. This factor is in a particularly preferred embodiment 0,97 but can of course be chosen to another value if this is deemed to be advantageous. It is in this context important that the earlier mentioned predetermined time t_1 when the humidity sensor again begins to determine the humidity content after the first value having been detected and stored is chosen so that the time t_2 when the humidity content reaches the detected value F_2 is not mistaken for the time t_3 at the beginning of the drying

process, when the value F_2 of the humidity content is passed. The value F_2 of the humidity content can, in the beginning of the drying process, be passed a number a times since the humidity content can fluctuate somewhat (not shown).

[0029] In a preferred embodiment the drying process is carried out by means of a time control which guarantees a certain minimal drying time. This time control in addition controls the drying process so that it does not go on longer than a certain predefined amount of time.

[0030] The invention is not limited to the above described examples of embodiments which have also been shown in the drawings but can be varied within the scope of the appended claims. For example, the valve is not necessary for the invention. Also the humidity sensor 22 does not need to be of the capacitive kind but other kinds of humidity sensors can also be used. Furthermore the invention is not limited to the application of dishwashers but can generally be applied to household machines where dishes are dried.

Claims

1. An adaptive method for drying heated dishes in a dish washing machine (1) by means of expelling present humid air from the washing area (2), **characterized in that** said method comprises the steps:

detecting the humidity content of the ambience which results in a first value;
storing this first value of the humidity content;
initiating the expulsion of the humid air;
the continuous detection of the humidity content of the expelled mixed air, which is mixed with the ambient atmosphere, which expelled mixed air continuously has lower and lower values of the humidity content; and
the interruption of the drying process when the value of the humidity content of the expelled mixed air reaches a value which has a predetermined relationship to the stored first value of the ambient humidity content.

2. The method according to claim 1 when drying dishes in a dishwasher (1), **characterized in that** the expulsion of the existing humid air in the washing area (2) of the dishwasher (1) is accomplished by means of blowing out the air through a corresponding door (5).

3. The method according to claim 2, **characterized in that** said expulsion of existing humid air in the washing area (2) of the dishwasher is done through an opening (10) from the washing area (2) via a fan (3), and further on through an air outlet (4).

4. Method according to claim 1, **characterized in that**

said humid air mixed with the ambient atmosphere has been expelled from the washing area (2), before it reaches a humidity sensor (22) in the door (5).

5. The method according to claim 3, **characterized in that** the expulsion of the humid air in the washing area (2) is made possible by the opening of a valve (9) which in a closed position separates the connection between the washing area (2) and the fan (3). 5
6. The method according to claim 5, **characterized in that** the manoeuvring of said valve (9) is done with a time delay. 10
7. The method according to claim 6, **characterized in that** said time delay is within the interval of 15-45 seconds. 15
8. A method according to any of the claims 3 or 5-7, **characterized in that** the air which by means of the influence of the fan (3) leaves the dishwasher (1) has been cooled since it has been led through a canal (8) in the door of the dishwasher, which canal ends at the lower edge of the door. 20
9. A method according to any of the claims 3 or 5-8, **characterized in that** the air which by means of the fan (3) exits the dishwasher (1) through an air outlet (4) in the lower edge of the hatch essentially flows out perpendicularly to the surface of the door (5). 25
10. A device for the adaptive drying of dishes in a dish washing machine (1) comprising a fan (3), for the expulsion of existing humid air in the washing area (2) of the dish washing machine (1), and a humidity sensor (22), **characterized in that** said humidity sensor (22) is arranged to detect the ambient humidity content before the fan (3) starts, the device further comprises a control unit (16) which is arranged to store a first value, the humidity sensor (22) is furthermore arranged to continuously detect the value of the humidity content of the expelled mixed air, and when this value reaches a predetermined relationship to the stored first value of the ambient humidity content, the drying process is interrupted. 30
11. A device according to claim 10 when drying dishes in a dishwasher, **characterized in that** the fan (3) is arranged in a door (5) of the dishwasher (1). 35
12. A device according to claim 10 or 11, **characterized in that** said device is arranged to mix the humid air expelled from the washing area (2) with the ambient atmosphere before it reaches said humidity sensor (22). 40

13. A device according to any of claims 10-12, **characterized in that** said device is arranged to enable the expulsion of the humid air in the washing area (2) by the opening of a valve (9), which in a closed position separates the connection between the washing area (2) and the fan (3). 45

14. A device according to claim 13, **characterized in that** said device comprises a wax engine (13) arranged to manoeuvre said valve (9), which wax engine (13) comprises delaying organs to carry out said manoeuvring with a time delay. 50

15. A device according to any of claims 10-14, **characterized in that** said device is arranged to cool the air which due to the influence of the fan (3) exits the dishwasher (1), by leading it through a canal (8) in the door (5) of the dishwasher (1) which canal (8) ends in the lower edge of the door (5). 55

16. A device according to claim 15, **characterized in that** said device is arranged in such a manner that the air which by means of the fan (3) exits the dishwasher (1) through an air outlet (4) in the lower edge of the door (5) essentially flows perpendicularly to the edge of the door (5). 60

17. A dish washing machine (1), **characterized in that** it comprises the device according to any of previous claims 10-16. 65

Patentansprüche

1. Adaptives Verfahren zum Trocknen von erhitztem Geschirr in einer Geschirrspülmaschine (1) durch Ausstoß von vorhandener feuchter Luft vom Spülbereich (2), **dadurch gekennzeichnet, dass** das Verfahren folgende Schritte umfasst: 70

Detektieren des Feuchtigkeitsgehalts der Umgebung, was einen ersten Wert ergibt;
Speichern des ersten Werts des Feuchtigkeitsgehalts;
Einleiten des Ausstoßens der feuchten Luft;
kontinuierliches Detektieren des Feuchtigkeitsgehalts der ausgestoßenen gemischten Luft, die mit der Umgebungsluft gemischt ist, welche ausgestoßene gemischte Luft kontinuierlich immer niedrigere Feuchtigkeitsgehaltswerte hat; und
Unterbrechen des Trocknungsprozesses, wenn der Feuchtigkeitsgehaltswert der ausgestoßenen gemischten Luft einen Wert erreicht, der ein vorbestimmtes Verhältnis zum gespeicherten ersten Wert des Feuchtigkeitsgehalts der Umgebung hat. 75

2. Verfahren nach Anspruch 1, beim Trocknen von Geschirr in einer Geschirrspülmaschine (1), **dadurch gekennzeichnet, dass** der Ausstoß der vorhandenen, feuchten Luft im Spülbereich (2) der Geschirrspülmaschine (1) durch Ausblasen der Luft durch eine entsprechende Tür (5) durchgeführt wird. 5
3. Verfahren nach Anspruch 2, **dadurch gekennzeichnet, dass** der Ausstoß der vorhandenen, feuchten Luft im Spülbereich (2) der Geschirrspülmaschine (1) durch eine Öffnung (10) vom Spülbereich (2) mittels eines Gebläses (3) und weiter durch einen Luftablass (4) durchgeführt wird. 10
4. Verfahren nach Anspruch 1, **dadurch gekennzeichnet, dass** die feuchte Luft, die mit der Umgebungsluft gemischt ist, aus dem Spülbereich (2) ausgestoßen worden ist, ehe sie einen Feuchtigkeitssensor (22) in der Tür (5) erreicht. 15
5. Verfahren nach Anspruch 3, **dadurch gekennzeichnet, dass** der Ausstoß der feuchten Luft im Spülbereich (2) durch die Öffnung eines Ventils (9) ermöglicht wird, welches Ventil in einer Schließstellung die Verbindung zwischen dem Spülbereich (2) und dem Gebläse (3) trennt. 20
6. Verfahren nach Anspruch 5, **dadurch gekennzeichnet, dass** das Manövrieren des Ventils (9) mit einer Zeitverzögerung durchgeführt wird. 25
7. Verfahren nach Anspruch 6, **dadurch gekennzeichnet, dass** die Zeitverzögerung innerhalb eines Bereichs von 15-45 Sekunden liegt. 30
8. Verfahren nach irgendeinem der Ansprüche 3 oder 5-7, **dadurch gekennzeichnet, dass** die Luft, die durch Einwirkung des Gebläses (3) die Geschirrspülmaschine (1) verlässt, abgekühlt worden ist, da sie durch einen Kanal (8) in der Tür der Geschirrspülmaschine geleitet worden ist, welcher Kanal an der unteren Kante der Tür endet. 35
9. Verfahren nach irgendeinem der Ansprüche 3 oder 5-8, **dadurch gekennzeichnet, dass** die Luft, die mittels des Gebläses (3) aus der Geschirrspülmaschine (1) durch einen Luftablass (4) in der unteren Kante der Klappe austritt, im Wesentlichen senkrecht zur Oberfläche der Tür (5) ausfließt. 40
10. Vorrichtung zum adaptiven Trocknen von Geschirr in einer Geschirrspülmaschine (1), umfassend ein Gebläse (3) zum Ausstoßen von vorhandener, feuchter Luft im Spülbereich (2) der Geschirrspülmaschine (1) und einen Feuchtigkeitssensor (22), **dadurch gekennzeichnet, dass** der Feuchtigkeitssensor (22) zum Detektieren des Feuchtigkeitsgehalts der Umgebung, ehe das Gebläse (3) eingeschaltet wird, eingerichtet ist, die Vorrichtung weiter eine Steuereinheit (16) umfasst, die zum Speichern eines ersten Werts eingerichtet ist, der Feuchtigkeitssensor (22) weiter zum kontinuierlichen Detektieren des Feuchtigkeitsgehalts der ausgestoßenen, gemischten Luft eingerichtet ist, und wenn dieser Wert ein vorbestimmtes Verhältnis zum gespeicherten ersten Wert des Feuchtigkeitsgehalts der Umgebung erreicht, der Trocknungsprozess unterbrochen wird. 45
11. Vorrichtung nach Anspruch 10, beim Trocknen von Geschirr in einer Geschirrspülmaschine, **dadurch gekennzeichnet, dass** das Gebläse (3) in einer Tür (5) der Geschirrspülmaschine (1) ausgeformt ist. 50
12. Vorrichtung nach Anspruch 10 oder 11, **dadurch gekennzeichnet, dass** die Vorrichtung zum Mischen der feuchten Luft, die aus dem Spülbereich (2) ausgestoßen worden ist, mit der Umgebungsluft, ehe sie den Feuchtigkeitssensor (22) erreicht, eingerichtet ist. 55
13. Vorrichtung nach irgendeinem der Ansprüche 10-12, **dadurch gekennzeichnet, dass** die Vorrichtung zum Aktivieren des Ausstoßens der feuchten Luft im Spülbereich (2) durch das Öffnen eines Ventils (9), das in einer Schließstellung die Verbindung zwischen dem Spülbereich (2) und dem Gebläse (3) trennt, eingerichtet ist.
14. Vorrichtung nach Anspruch 13, **dadurch gekennzeichnet, dass** die Vorrichtung einen Wachsmotor (13) umfasst, der zum Manövrieren des Ventils (9) eingerichtet ist, welcher Wachsmotor (13) Verzögerungsmittel zum Ausführen des Manövrierens mit einer Zeitverzögerung umfasst.
15. Vorrichtung nach Anspruch 10-14, **dadurch gekennzeichnet, dass** die Vorrichtung zum Abkühlen der Luft, die durch Einwirkung des Gebläses (3) aus der Geschirrspülmaschine (1) austritt, so eingerichtet ist, dass sie die Luft durch einen Kanal (8) in der Tür (5) der Geschirrspülmaschine (1) leitet, welcher Kanal (8) in der unteren Kante der Tür (5) endet.
16. Vorrichtung nach Anspruch 15, **dadurch gekennzeichnet, dass** die Vorrichtung so eingerichtet ist, dass die Luft, die mittels des Gebläses (3) aus der Geschirrspülmaschine (1) durch einen Luftablass (4) in der unteren Kante der Tür (5) austritt, im Wesentlichen senkrecht zur Kante der Tür (5) fließt.
17. Geschirrspülmaschine (1), **dadurch gekennzeichnet, dass** sie die Vorrichtung nach irgendeinem der vorhergehenden Ansprüche 10-16 umfasst.

Revendications

1. Procédé adaptatif pour le séchage des plats chauffés dans une machine à laver la vaisselle (1) au moyen d'une expulsion d'air humide présent depuis la zone de lavage (2), **caractérisé en ce que** ledit procédé comprend les étapes de:
 - détecter la teneur en humidité de l'ambiance, ce qui se traduit par une première valeur;
 - stocker cette première valeur de la teneur en humidité;
 - initier l'expulsion de l'air humide;
 - détecter en continu la teneur en humidité de l'air mixte expulsé qui est mélangé avec l'atmosphère ambiante, l'air mixte expulsé ayant en permanence des valeurs de plus en plus inférieures de la teneur en humidité; et
 - l'interruption du processus de séchage lorsque la valeur de la teneur en humidité de l'air mixte expulsé atteint une valeur qui a une relation prédéterminée à la première valeur stockée de la teneur en humidité ambiante.
2. Procédé selon la revendication 1 lors du séchage des plats dans un lave-vaisselle (1), **caractérisé en ce que** l'expulsion de l'air humide existant dans la zone de lavage (2) du lave-vaisselle (1) est réalisée au moyen d'une évacuation par soufflage de l'air à travers une porte correspondante (5).
3. Procédé selon la revendication 2, **caractérisé en ce que** l'expulsion de l'air humide existant dans la zone de lavage (2) du lave-vaisselle est effectuée à travers une ouverture (10) depuis la zone de lavage (2) via un ventilateur (3), et continue par une sortie d'air (4).
4. Procédé selon la revendication 1, **caractérisé en ce que** l'air humide mélangé avec l'atmosphère ambiante a été expulsé de la zone de lavage (2), avant qu'il n'atteigne un capteur d'humidité (22) dans la porte (5).
5. Procédé selon la revendication 3, **caractérisé en ce que** l'expulsion de l'air humide dans la zone de lavage (2) est rendue possible par l'ouverture d'une soupape (9) qui, dans une position fermée, sépare la connexion entre la zone de lavage (2) et le ventilateur (3).
6. Procédé selon la revendication 5, **caractérisé en ce que** la manoeuvre de ladite soupape (9) se fait avec un temps de retard.
7. Procédé selon la revendication 6, **caractérisé en ce que** ledit temps de retard est dans l'intervalle de 15 à 45 secondes.
8. Procédé selon l'une quelconque des revendications 3 ou 5 à 7, **caractérisé en ce que** l'air qui, en raison de l'influence du ventilateur (3), sort du lave-vaisselle (1), a été refroidi depuis qu'il a été amené par un canal (8) dans la porte du lave-vaisselle, canal qui se termine au bord inférieur de la porte.
9. Procédé selon l'une quelconque des revendications 3 ou 5 à 8, **caractérisé en ce que** l'air qui, au moyen du ventilateur (3), sort du lave-vaisselle (1) à travers une ouverture (4) dans le bord inférieur du volet, sort en coulant essentiellement perpendiculairement à la surface de la porte (5).
10. Dispositif pour le séchage adaptatif des plats dans une machine à laver la vaisselle (1) comprenant un ventilateur (3) pour l'expulsion de l'air humide existant dans la zone de lavage (2) de la machine à laver la vaisselle (1) et un capteur d'humidité (22), **caractérisé en ce que** ledit capteur d'humidité (22) est agencé pour détecter la teneur en humidité ambiante avant que le ventilateur (3) ne démarre, le dispositif comprenant en outre une unité de contrôle (16) qui est agencée pour stocker une première valeur, le capteur d'humidité (22) est en outre agencé pour détecter en continu la valeur de la teneur en humidité de l'air mixte expulsé, et lorsque cette valeur atteint une relation prédéterminée à la première valeur stockée de la teneur d'humidité ambiante, le processus de séchage est interrompu.
11. Dispositif selon la revendication 10 lors du séchage des plats dans un lave-vaisselle (1), **caractérisé en ce que** le ventilateur (3) est disposé dans une porte (5) du lave-vaisselle (1).
12. Dispositif selon la revendication 10 ou 11, **caractérisé en ce que** ledit dispositif est agencé pour mélanger l'air humide expulsé de la zone de lavage (2) avec l'atmosphère ambiante avant qu'il n'atteigne ledit capteur d'humidité (22).
13. Dispositif selon l'une quelconque des revendications 10 à 12, **caractérisé en ce que** ledit dispositif est agencé pour permettre l'expulsion de l'air humide dans la zone de lavage (2) par l'ouverture d'une soupape (9) qui, dans une position fermée, sépare la connexion entre la zone de lavage (2) et le ventilateur (3).
14. Dispositif selon la revendication 13, **caractérisé en ce que** ledit dispositif comprend un moteur de cire (13) agencé pour manoeuvrer ladite soupape (9), moteur de cire (13) qui comporte des éléments de retard pour effectuer ladite manoeuvre avec un temps de retard.
15. Dispositif selon l'une quelconque des revendications

10 à 14, **caractérisé en ce que** ledit dispositif est agencé pour refroidir l'air qui, en raison de l'influence du ventilateur (3), sort du lave-vaisselle (1), en le menant par un canal (8) dans la porte (5) du lave-vaisselle (1), canal (8) qui se termine dans le bord inférieur de la porte (5). 5

16. Dispositif selon la revendication 15, **caractérisé en ce que** ledit dispositif est agencé de telle manière que l'air qui, au moyen du ventilateur (3) sort du lave-vaisselle (1) à travers une ouverture (4) dans le bord inférieur de la porte (5), coule essentiellement perpendiculairement au bord de la porte (5). 10

17. Machine à laver la vaisselle (1), **caractérisée en ce qu'il** comporte un dispositif selon l'une quelconque des revendications précédentes 10 à 16. 15

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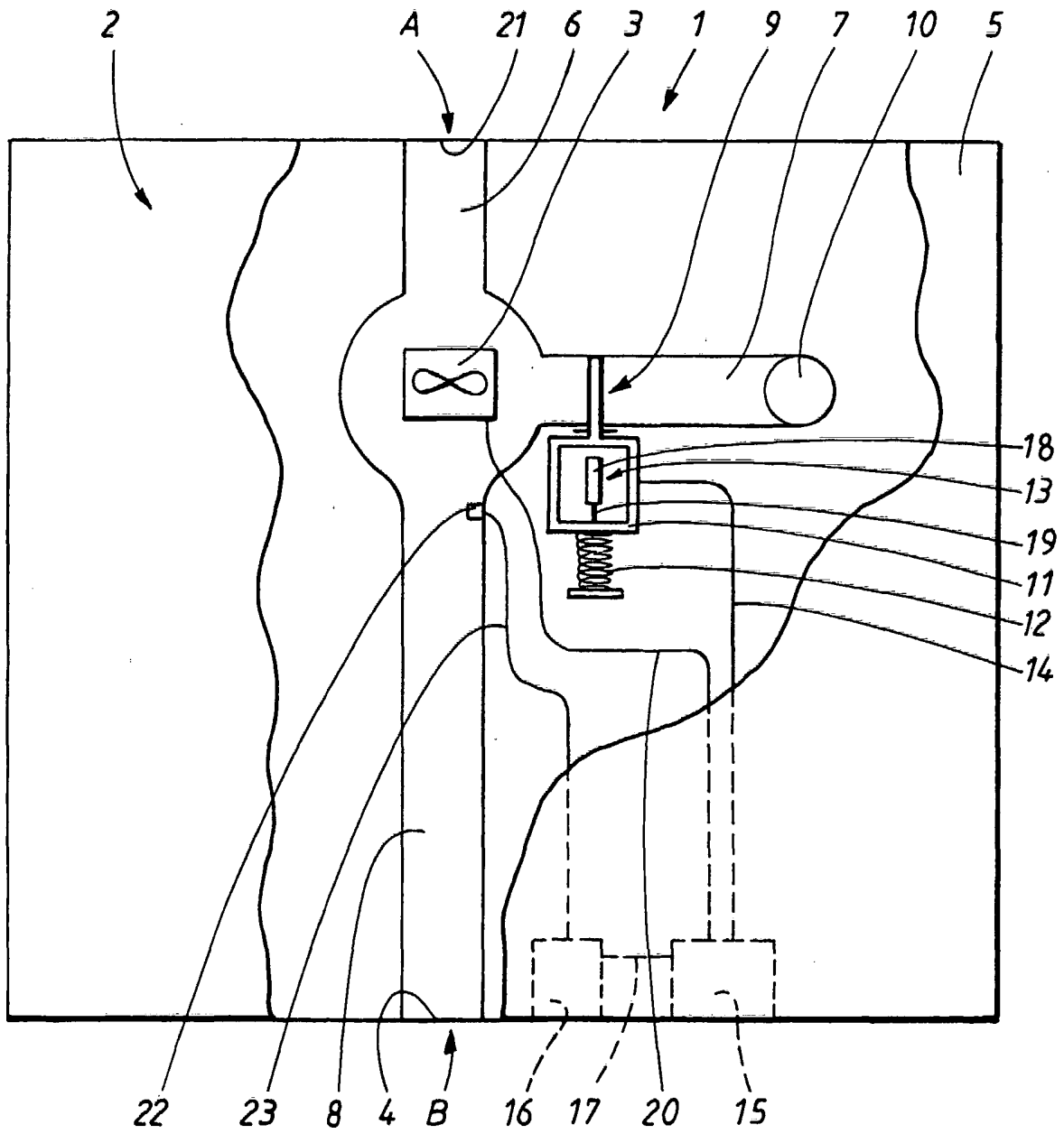


FIG. 1

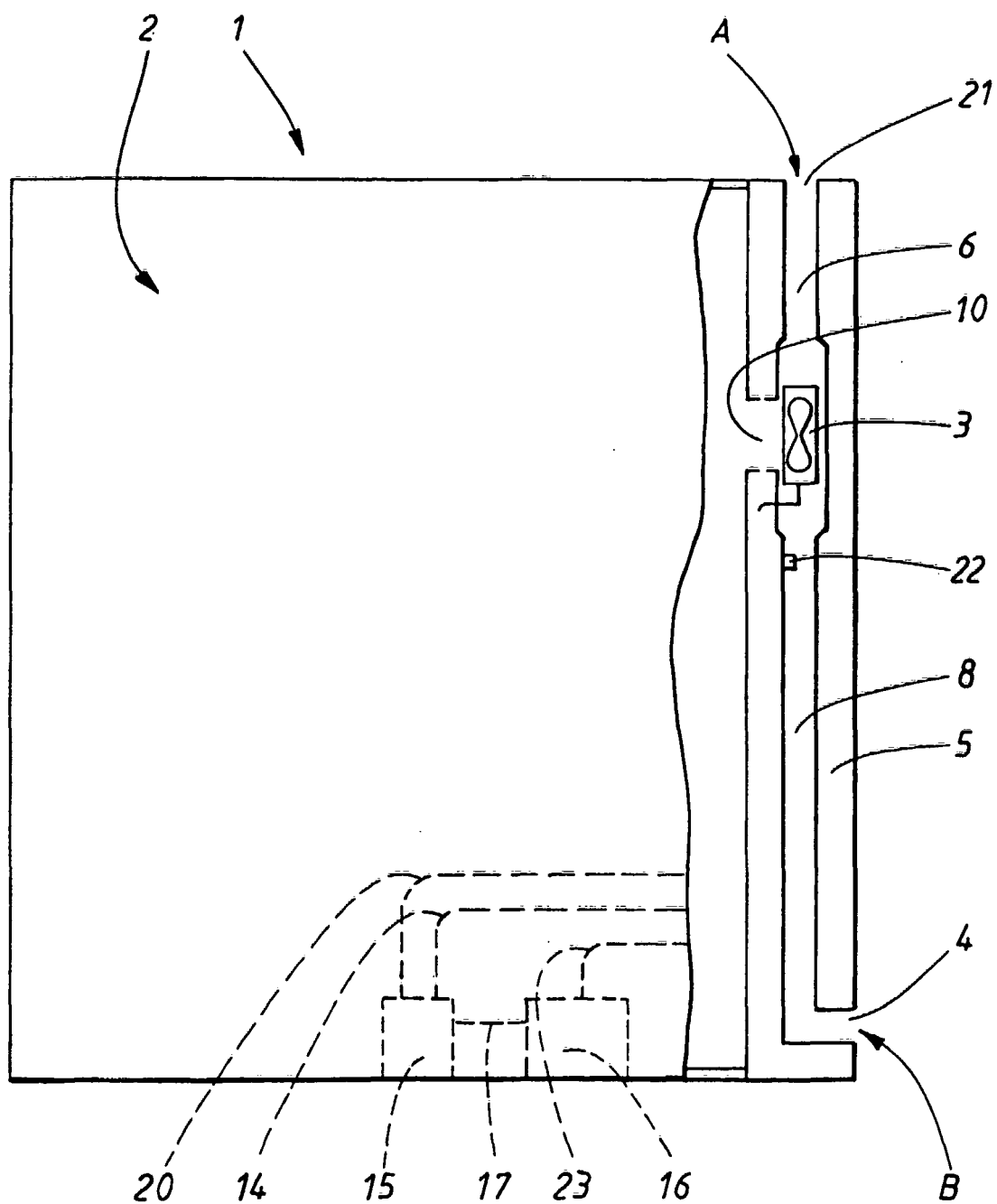


FIG. 2

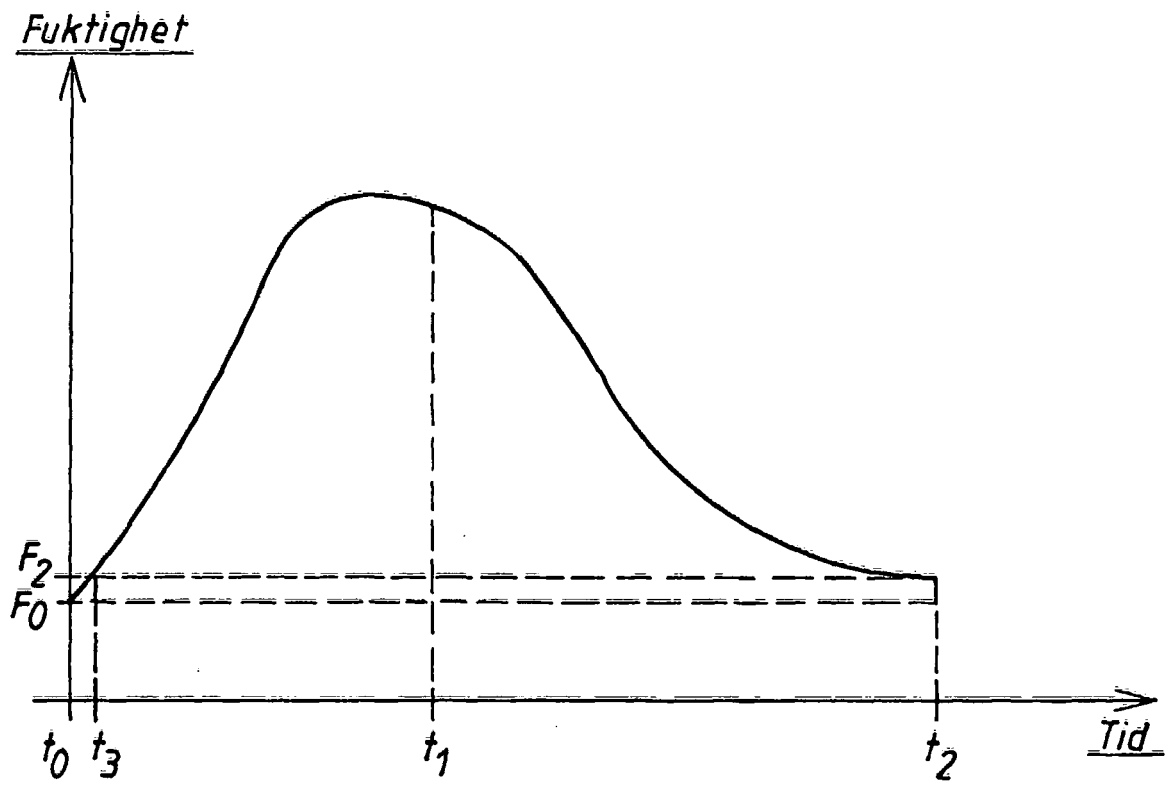


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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