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(54) **DISHWASHER WITH TEMPERATURE INCREASE FOR HYGIENIC ENVIRONMENT**

GESCHIRRSPÜLER MIT TEMPERATURERHÖHUNG FÜR HYGIENISCHE UMGEBUNG

LAVE-VAISSELLE AVEC AUGMENTATION DE TEMPÉRATURE POUR UN ENVIRONNEMENT
HYGIÉNIQUE

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Description

[0001] The present invention relates to a dishwasher wherein a hygienic environment is maintained in the washing tub.

[0002] In dishwashers, the washing process is performed at a temperature value selected by the user. If the temperature of the wash water is low, for example under 60° C, a layer of bacteria residing at some regions in the washing tub is formed wherein with the lapse of time. Since bacteria are hazardous for the health of the user, they should be removed from the washing tub.

[0003] In dishwashers, in order to provide hygiene in the washing tub, special hygienic programs are accommodated or bacteria accumulation level is measured by using complex methods or cost increasing sensors and the washing program parameters are changed to maintain hygiene.

[0004] In the state of the art International Patent Application No WO2004-058038, a dishwasher is explained wherein a biosensor is used to provide hygiene. A dishwasher according to the pre-amble of claim 1 is disclosed by document DE 10 2004 030 013 A1.

[0005] The object of the present invention is to design a dishwasher wherein hygiene is maintained in the washing tub.

[0006] The dishwasher designed to fulfill the objective of the present invention, explicated in the first claim and the respective claims thereof, does not allow the user to perform washing continually at low temperatures. The number of consecutive low temperature washings is limited for removing the bacteria accumulated in the washing tub.

[0007] In an embodiment of the present invention, if the number of successive washings at low temperature is in excess of a limit value, the next washing temperature is automatically kept higher.

[0008] In an embodiment of the present invention, the user is informed by a warning means.

[0009] By means of the present invention, performing washing continually at low temperatures is prevented and hygiene is maintained by performing washing at high temperatures at certain intervals.

[0010] The dishwasher designed to fulfill the objective of the present invention is illustrated in the attached figures, where:

[0011] Figure 1 - is the schematic view of a dishwasher.

[0012] The elements illustrated in the figures are numbered as follows:

1. Dishwasher
2. Washing tub
3. Control unit
4. Warning means

[0013] The dishwasher (1) of the present invention comprises a washing tub (2) wherein items to be washed are placed and a control unit (3) that maintains the control

of the washing program (Figure 1).

[0014] When a washing program is selected by the user or when a washing program is started automatically by the dishwasher (1), a washing temperature (T_y) is also specified for the washing program. The washing temperature (T_y) is the highest temperature for heating the wash water used in the main washing of the washing program. The washing temperature (T_y) is compared with a limit temperature value (T_l) kept in the memory of the control unit (3).

[0015] The limit temperature value (T_l) is determined by the producer and saved in the memory. The limit temperature value (T_l) is a temperature to which the wash water has to reach in order to prevent the formation of bacteria in the washing tub (2). When washing process is performed in the dishwasher (1) at the limit temperature value (T_l) hygiene is maintained since temperatures are reached that remove bacteria in the washing tub (2).

[0016] If the washing temperature (T_y) is lower than the limit temperature value (T_l), then the counter (s) in the memory of the control unit (3) used for counting the number of washing programs is increased by one, otherwise the counter (s) is reset to zero. The number of successive washing programs performed at washing temperatures (T_y) below the limit temperature value (T_l) is counted by the counter (s).

[0017] The value of the counter (s) is compared with a limit number of washings (n). The limit number of washings (n) is a limit value of washing programs that can be performed successively in the washing tub (2) at washing temperatures (T_y) lower than the limit temperature value (T_l) without allowing the formation of bacteria in the washing tub (2). If the number of washing programs counted by the counter (s) successive equals the limit number of washings (n), the next washing is performed by the control unit (3) at a washing temperature (T_y) that is equal to or higher than the limit temperature (T_l) value. Consequently, the formation of bacteria in the washing tub (2) is prevented.

[0018] If the washing temperature (T_y) of a selected washing program is equal to or higher than the limit temperature (T_l) value before the counter (s) successive equals the limit number of washings (n), then the counter (s) is zeroed since hygiene is maintained in the washing tub (2).

[0019] In an embodiment of the present invention, if the counter (s) successive equals the limit number of washings (n), the washing temperature (T_y) of the next washing program is automatically equaled to the limit temperature (T_l) by the control unit (3). The user can increase this temperature but cannot lower it.

[0020] In another embodiment of the present invention, if the counter (s) successive equals the limit number of washings (n) and when a washing program appropriate for washing sensitive items is selected, then the washing process to be performed at the limit temperature (T_l) is postponed by the control unit (3).

[0021] In another embodiment of the present inven-

tion, the dishwasher (1) comprises a warning means (4). The warning means (4) is used for notifying the user by a display or an audio/visual means. If the counter (s) successive equals the limit number of washings (n), then the user is informed through the warning means (4) by the control unit (3) before the next program starts. With this embodiment, the possibility of the user making an error is reduced.

[0022] In the embodiment wherein the warning means (4) is a display, the user is warned by phrases such as "Choose the temperature value to be at least T# for maintaining hygiene" or "Washing will be performed at temperature T#, do not load sensitive items" etc.

[0023] By means of the present invention, the bacteria accumulation in the washing tub (2) that may occur when the dishwasher (1) is not operated successively at temperatures that will maintain hygiene is prevented.

Claims

1. A dishwasher (1) comprising a washing tub (2) wherein items to be washed are placed, a control unit (3) that maintains the control of a washing program and a counter (s) in a memory of the control unit (3) used for counting the number of successive washing programs performed at washing temperatures (Ty) below a limit temperature value (T₁) which is kept in the memory of the control unit (3), **characterized in that**, the control unit (3) performs the next washing program at a washing temperature (Ty) that is equal to or higher than the limit temperature value (T₁) when the counter (s) showing the number of successive washing programs performed at washing temperatures (Ty) lower than the limit temperature value (T₁) equals a limit number of successive washings (n).
2. A dishwasher (1) as in Claim 1, **characterized by** the control unit (3) that automatically equals the washing temperature (Ty) of the next washing program to the limit temperature value (T₁) when the counter (s) successively equals the limit number of washings (n).
3. A dishwasher (1) as in Claim 1, **characterized by** the control unit (3) that postpones the washing process to be performed at limit temperature value (T₁) if the counter (s) equals the limit number of washings (n) and if a washing successively program appropriate for washing sensitive items is selected.
4. A dishwasher (1) as in any one of the above claims, **characterized by** a warning means (4) through which the user is informed by the control unit (3) before the next program starts if the counter (s) successive-

ly equals the limit number of washings (n).

Patentansprüche

1. Geschirrspüler (1), umfassend einen Spülbehälter (2), in den zu spülende Gegenstände gegeben werden, eine Steuereinheit (3), die die Steuerung eines Spülprogramms und eines Zählers (s) in einem Speicher der Steuereinheit (3) verwaltet, der zum Zählen der Anzahl nachfolgender Spülprogramme dient, die bei Spültemperaturen (Ty) unter einem Temperaturgrenzwert (T₁) durchgeführt werden, welcher im Speicher der Steuereinheit (3) abgelegt ist, **dadurch gekennzeichnet, dass** die Steuereinheit (3) das nächste Spülprogramm bei einer Spültemperatur (Ty) durchführt, die gleich wie oder höher als der Temperaturgrenzwert (T₁) ist, wenn der Zähler (s) zeigt, dass die Anzahl nachfolgender Spülprogramme, die bei Spültemperaturen (Ty) unter dem Temperaturgrenzwert (T₁) durchgeführt werden, gleich einem Grenzwert nachfolgender Spülvorgänge (n) ist.
2. Geschirrspüler (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Steuereinheit (3) automatisch die Spültemperatur (Ty) des nächsten Spülprogramms an den Temperaturgrenzwert (T₁) angleicht, wenn der Zähler (s) nacheinanderfolgend gleich dem Grenzwert der Anzahl von Spülvorgängen (n) ist.
3. Geschirrspüler (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Steuereinheit (3) den Spülvorgang, der bei einem Temperaturgrenzwert (T₁) durchgeführt werden soll, verschiebt, wenn der Zähler (s) nacheinanderfolgend gleich dem Grenzwert der Anzahl von Spülvorgängen (n) ist und wenn ein Spülprogramm ausgewählt wird, das zum Spülen empfindlicher Artikel geeignet ist.
4. Geschirrspüler (1) nach einem der vorangehenden Ansprüche, **gekennzeichnet durch** ein Warnmittel (4), **durch** das der Benutzer von der Steuereinheit (3) informiert wird, bevor das nächste Programm startet, wenn der Zähler(s) nacheinanderfolgend gleich dem Grenzwert der Anzahl von Spülvorgängen (n) ist.

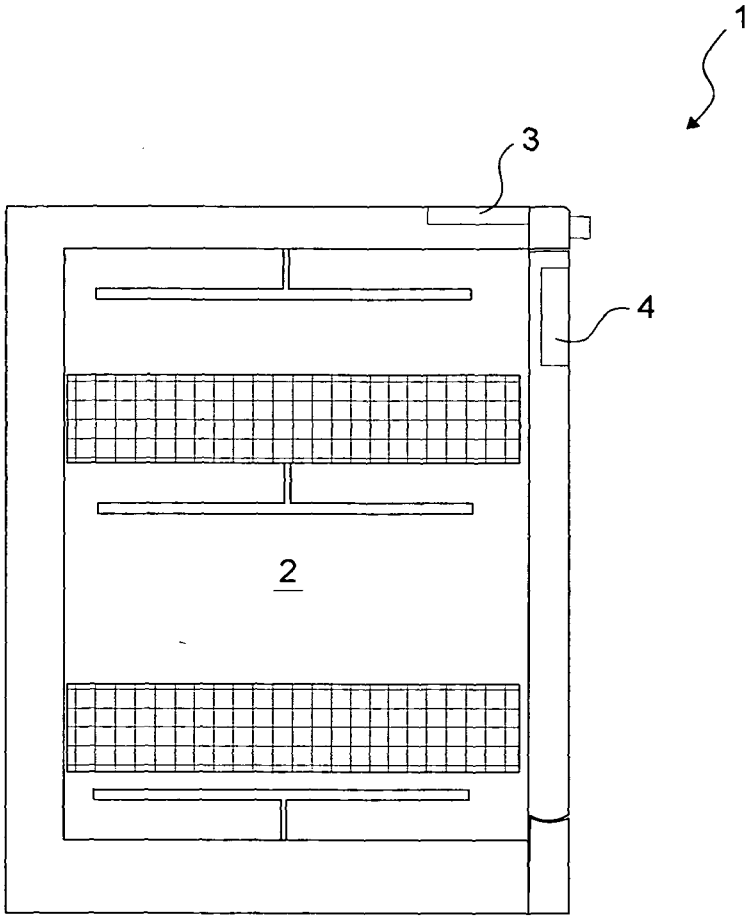
Revendications

1. Un lave-vaisselle (1) comprenant une cuve de lavage (2) dans laquelle les objets à laver sont placés, une unité de commande (3) qui assure la contrôle d'un programme de lavage et un/des compteur(s) dans une mémoire de l'unité de commande (3) utilisé (s) pour compter le nombre de programmes de la-

vage successifs effectués à des températures (T_y) sous une valeur limite de température (T_l) qui est enregistrée dans la mémoire de l'unité de commande (3), **caractérisé en ce que** l'unité de commande (3) effectue le programme de lavage suivant à une température de lavage (T_y) qui est égale ou supérieure à la valeur limite de température (T_l) lorsque le(s) compteur(s) indiquant le nombre de programmes de lavage successifs effectués à des températures de lavage (T_y) inférieures à la valeur limite de température (T_l) est égal à un nombre limite de lavages successifs (n).

2. Un lave-vaisselle (1) selon la Revendication 1, **caractérisé par** l'unité de commande (3) qui égale la température de lavage (T_y) du programme de lavage suivant à la valeur limite de température (T_l) lorsque le(s) compteur(s) égale(nt) successivement le nombre limite de lavages (n).
3. Un lave-vaisselle (1) selon la Revendication 1, **caractérisé par** l'unité de commande (3) qui retarde le processus de lavage à être effectué à la valeur limite de température (T_l) si le(s) compteur(s) égale(nt) successivement le nombre limite de lavages (n) et si un programme de lavage approprié pour le lavage des objets sensibles est sélectionné.
4. Un lave-vaisselle (1) selon l'une quelconque des revendications précédentes, **caractérisé par** un moyen d'avertissement (4) par lequel l'utilisateur est averti par l'unité de commande (3) avant que le programme suivant commence si le(s) compteur(s) égale(nt) successivement le nombre limite de lavages (n).

Figure 1



REFERENCES CITED IN THE DESCRIPTION

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