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(54) **A DISHWASHER PROVIDING DISINFECTION**

(57) The present invention relates to a dishwasher (1) comprising a body (2); a washing tub (3) which is arranged in the body (2) and wherein the washing process is realized; a heater (5) which heats the water filled into the washing tub (3); at least one rack (7) which is disposed in the washing tub (3) and whereon the kitchen items are placed; at least one spraying member (8) which

enables the water to be sprayed onto the rack (7); a dosing member (9) which enables the additional cleaning agent loaded to be delivered into the washing tub (3) and which is disposed on the rack (7); and at least one conductivity sensor (10) which is disposed in the washing tub (3).

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Description

[0001] The present invention relates to a dishwasher which provides disinfection.

[0002] In dishwashers, detergent dispensers which are generally mounted on the inner side of the door are used. Said dispensers have receptacles for placing chemical agents such as detergent, rinse aid, etc. The detergent in the receptacle ensures the dirt residues on the dishes to be dissolved while the rinse aid decreases the surface tension of the water so as to improve the drying efficiency. The chemical agents used in the cleaning process can be efficient only when used at the correct step. For example, the detergent must be added into the water at the main washing step while agents such as rinse aid, glass protector, etc. must be added at the hot rinsing (second rinsing) step. When powdered and/or liquid chemical agents are used, each chemical agent is placed into its own proper receptacle, and said receptacles are opened at the correct step such that the correct chemical agent is used at the correct time. In addition to said agents, today, the users often use cleaning agents such as laundry bleach, vinegar, etc. in order to eliminate microorganisms. However, if concentrated chemical agents such as laundry bleach are not dosed in the correct amount and at the correct time, residues may remain on the kitchen items, which in turn adversely affects the health of the user. Therefore, dosing apparatuses are used for this purpose. The user loads additional cleaning agents such as vinegar, bleach, etc. into the dosing apparatus. However, in some cases, the user may add chemicals into the washing tub or chemical residues may remain in the washing tub at the end of the washing process.

[0003] In the state of the United States of America Patent Application No. US2012186614, a method is disclosed, used in household appliances such as dishwasher, washing machine, etc. for detecting the type of the chemical by means of a circuit board.

[0004] The aim of the present invention is the realization of a dishwasher wherein hygiene is ensured in an efficient and safe manner.

[0005] The dishwasher realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a body; a washing tub which is disposed in the body; a door which isolates the washing tub; a detergent dispenser which is disposed on the door or the washing tub; a heater which heats the water in the washing tub; a rack which is disposed in the washing tub; at least one spraying member which sprays water onto the rack; a dosing member which is disposed on the rack; and at least one conductivity sensor which is disposed in the washing tub. The kitchen items are placed onto the rack to be washed. The water is sprayed onto the kitchen items by means of the spraying member. By means of the heater contacting the water, the washing water is heated, thus ensuring a more active cleaning process. The user loads additional cleaning agents such as vinegar, bleach, etc. into the dosing ap-

paratus. Thus, the additional cleaning agents are delivered into the washing tub in a controlled manner. The conductivity sensor which is positioned on the washing tub close to the base measures the values of the washing tub.

[0006] The dishwasher of the present invention comprises a control unit which changes the washing steps if an additional chemical is detected in the washing tub by means of the conductivity sensor. When an additional chemical is detected in the washing tub other than the additional cleaning agents such as vinegar, bleach, etc. which are added by the user, the control unit changes the washing steps. Thus, the chemicals are prevented from reacting while the risk of releasing harmful gases is eliminated.

[0007] In an embodiment of the present invention, the dishwasher comprises the control unit which prevents the dosing member from carrying out the dosing process when an additional chemical is detected in the washing tub. Thus, the additional cleaning agents such as vinegar, bleach, etc. loaded by the user are prevented from mixing with the chemical detected in the washing tub.

[0008] In an embodiment of the present invention, the dishwasher comprises the control unit which discharges the water in the washing tub, and retakes water therein so as to repeat the measurement when an additional chemical is detected in the washing tub. The discharge and measurement processes are repeated until no additional chemical is detected at the end of the measurement.

[0009] In an embodiment of the present invention, the dishwasher comprises the control unit which prevents the water in the washing tub from being heated when an additional chemical is detected in the washing tub. The heater is not operated when an additional chemical is detected. Thus, the chemical is prevented from reacting due to heat.

[0010] In an embodiment of the present invention, the dishwasher comprises the control unit which discharges the additional cleaning agent in the dosing member when detergent is detected in the washing tub. Thus, the additional cleaning agent is not dosed into the washing tub and prevented from reacting with the detergent.

[0011] In an embodiment of the present invention, the dishwasher comprises a turbidity sensor which is provided in the washing tub, and the control unit which detects the type of the additional chemical by means of the turbidity sensor. Two types of bleaches can be used. The chlorine-based bleaches can be detected by means of the conductivity sensor. The peroxide-based bleaches can be detected by means of the turbidity sensor since they may foam. Thus, the type of the chemical can be determined.

[0012] In an embodiment of the present invention, the dishwasher comprises the control unit which carries out simultaneous measurements by means of the turbidity sensor and the conductivity sensor. Thus, the type of the chemical can be quickly determined such that the wash-

ing steps are controlled.

[0013] By means of the present invention, a dishwasher is realized, comprising the control unit which prevents the chemicals used in the washing tub from reacting.

[0014] A dishwasher realized in order to attain the aim of the present invention is illustrated in the attached figure, where:

Figure 1 - is the perspective view of the dishwasher.

[0015] The elements illustrated in the figures are numbered as follows:

1. Dishwasher
2. Body
3. Washing tub
4. Door
5. Heater
6. Detergent dispenser
7. Rack
8. Spraying member
9. Dosing member
10. Conductivity sensor
11. Control unit
12. Turbidity sensor

[0016] The dishwasher (1) comprises a body (2); a washing tub (3) which is arranged in the body (2) and wherein the washing process is realized; a door (4) which isolates the washing tub (3) from the outer environment; a heater (5) which heats the water filled into the washing tub (3); a detergent dispenser (6) which is disposed in the washing tub (3) and/or on the door (4) and wherein detergent is loaded; at least one rack (7) which is disposed in the washing tub (3) and whereon the kitchen items are placed; at least one spraying member (8) which enables the water to be sprayed onto the rack (7); a dosing member (9) which enables the additional cleaning agent loaded to be delivered into the washing tub (3) and which is disposed on the rack (7); and at least one conductivity sensor (10) which is disposed in the washing tub (3). The kitchen items are placed onto the rack (7). The water is sprayed onto the kitchen items by means of the spraying members (8). The heater (5) heats the water delivered. Thus, an effective cleaning process is carried out. A detergent dispenser (6) is disposed in the washing tub (3). Detergent is loaded into the detergent dispenser (6) to carry out the washing process. Additional cleaning agents such as vinegar, bleach, etc. are loaded into the dosing member (9).

[0017] The dishwasher (1) of the present invention comprises a control unit (11) which changes the washing steps if an additional chemical other than the additional cleaning agent is detected in the washing tub (3) by means of the conductivity sensor (10). The control unit (11) changes the washing steps to be executed if an additional chemical other than the additional cleaning agent in the dosing member (9) and the detergent in the detergent dispenser (6) is detected in the washing tub (3). Thus, the chemicals are prevented from mixing with each

other while the risk of releasing harmful gases is eliminated. Thus, the dishwasher (1) and the kitchen items are prevented from getting deformed.

[0018] In an embodiment of the present invention, the dishwasher (1) comprises the control unit (11) which prevents the dosing member (9) from carrying out the dosing process when an additional chemical is detected in the washing tub (3). The additional cleaning agent in the dosing member (9) is not dosed when an additional chemical remaining from the previous washing processes in the washing tub (3) or added by the user into the washing tub (3) is detected. Thus, the additional cleaning agent and the additional chemical are prevented from mixing and reacting.

[0019] In an embodiment of the present invention, the dishwasher (1) comprises the control unit (11) which carries out the steps of discharging the water in the washing tub (3), and retaking water into the washing tub (3) so as to repeat the measurement when an additional chemical is detected in the washing tub (3). The water in the washing tub (3) is discharged when an additional chemical is detected by measuring the water filled into the washing tub (3). Water is retaken into the washing tub (3) and the measurement is repeated until no chemical is detected.

Thus, a safe washing process is performed.

[0020] In an embodiment of the present invention, the dishwasher (1) comprises the control unit (11) which provides the intake of water into the washing tub (3) for measurement and prevents the heater (5) from operating when an additional chemical is detected in the washing tub (3). When water is taken for carrying out measurements to detect additional chemicals, the water is not heated. When no chemical is detected, the water is heated and the washing process is started. Thus, savings in energy are provided, and the chemical is prevented from reacting with the hot water.

[0021] In an embodiment of the present invention, the dishwasher (1) comprises the control unit (11) which discharges the additional cleaning agent in the dosing member (9) when detergent is detected in the washing tub (3). The additional cleaning agent is discharged and the dosing process is not performed when detergent is detected in the washing tub (3). The washing process continues only with detergent.

[0022] In an embodiment of the present invention, the dishwasher (1) comprises a turbidity sensor (12) which is provided in the washing tub (3), and the control unit (11) which determines the type of the additional chemical by means of the turbidity sensor (12). Two types of additional chemicals can be loaded. The chlorine-based chemicals can be detected by means of the conductivity sensor (10). The peroxide-based chemicals cannot be detected by the conductivity sensor (10), but can be detected by means of the turbidity sensor (12) since they tend to foam. Necessary changes are made in the washing steps to discharge the peroxide-based chemicals and the chlorine-based chemicals from the washing tub (3).

[0023] In an embodiment of the present invention, the

dishwasher (1) comprises the control unit (11) which carries out simultaneous measurements by means of the turbidity sensor (12) and the conductivity sensor (10) to detect the type of the chemical. The type of the chemical is determined by carrying out simultaneous measurements by means of the turbidity sensor (12) and the conductivity sensor (10). The relevant sensor is controlled for measurement depending on the detected type of chemical.

[0024] By means of the present invention, a dishwasher (1) is realized, comprising a control unit which changes the washing steps due to detection of chemicals as a result of measurements carried out in the washing tub (3). Thus, the chemical added into the washing tub (3) in an uncontrolled manner and the type of the chemical are detected, and the chemical is discharged.

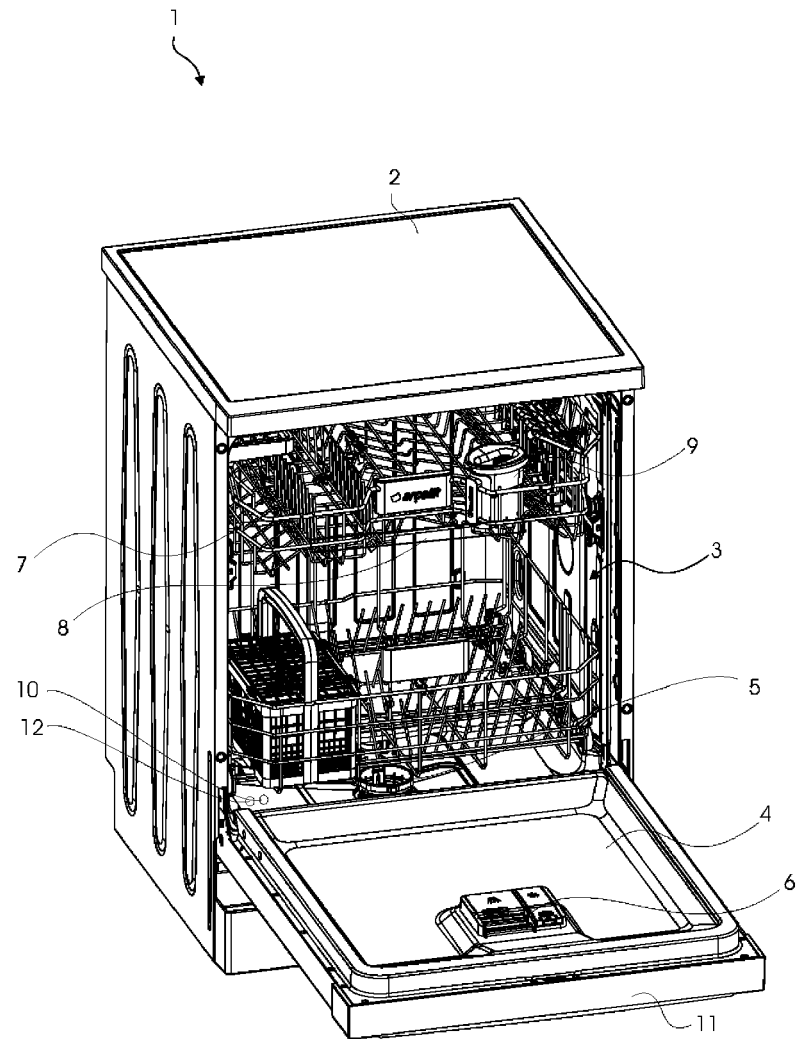
Claims

1. A dishwasher (1) comprising a body (2); a washing tub (3) which is arranged in the body (2) and wherein the washing process is realized; a door (4) which isolates the washing tub (3) from the outer environment; a heater (5) which heats the water filled into the washing tub (3); a detergent dispenser (6) which is disposed in the washing tub (3) and/or on the door (4) and wherein detergent is loaded; at least one rack (7) which is disposed in the washing tub (3) and wherein the kitchen items are placed; at least one spraying member (8) which enables the water to be sprayed onto the rack (7); a dosing member (9) which enables the additional cleaning agent loaded to be delivered into the washing tub (3) and which is disposed on the rack (7); and at least one conductivity sensor (10) which is disposed in the washing tub (3), **characterized by** a control unit (11) which changes the washing steps if an additional chemical other than the additional cleaning agent is detected in the washing tub (3) by means of the conductivity sensor (10).
2. A dishwasher (1) as in Claim 1, **characterized by** the control unit (11) which prevents the dosing member (9) from carrying out the dosing process when an additional chemical is detected in the washing tub (3).
3. A dishwasher (1) as in Claim 1 or Claim 2, **characterized by** the control unit (11) which carries out the steps of discharging the water in the washing tub (3), and retaking water into the washing tub (3) so as to repeat the measurement when an additional chemical is detected in the washing tub (3).
4. A dishwasher (1) as in any one of the above claims, **characterized by** the control unit (11) which provides the intake of water into the washing tub (3) for

measurement and prevents the heater (5) from operating when an additional chemical is detected in the washing tub (3).

5. A dishwasher (1) as in any one of the above claims, **characterized by** the control unit (11) which discharges the additional cleaning agent in the dosing member (9) when detergent is detected in the washing tub (3).
6. A dishwasher (1) as in any one of the above claims, **characterized by** a turbidity sensor (12) which is provided in the washing tub (3), and the control unit (11) which determines the type of the additional chemical by means of the turbidity sensor (12).
7. A dishwasher (1) as in Claim 6, **characterized by** the control unit (11) which carries out simultaneous measurements by means of the turbidity sensor (12) and the conductivity sensor (10) to detect the type of the chemical.

Figure 1





EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

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A	* column 4, line 13 - column 9, line 32; figures *	2-5	
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A	* paragraph [0021] - paragraph [0119]; figures *	2-5	
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A	* page 1, line 114 - page 2, line 84; figure 3 *	2-5	
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 May 2022	Examiner Sangiorgi, Massimo
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

**ANNEX TO THE EUROPEAN SEARCH REPORT
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09-05-2022

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