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(54) **Folyóképes mosó- vagy tisztítószert adagoló eszköz vezérlésére szolgáló eljárás**

**Method for controlling a dispensing device for flowable detergents or cleaning agents**

[0002] The invention relates to a method for controlling a dispensing device of a stand-alone dispensing system for flowable detergents or cleaning agents, preferably for use in a dishwasher, having the features of the preamble of claim 1. The invention also relates to a dispenser, using which this method can be carried out.

[0003] One of the main aims of a manufacturer of cleaning agents for machines is that of improving the cleaning performance of these agents, increased emphasis recently being placed on the cleaning performance at low-temperature cleaning stages or in cleaning stages that use less water. For this purpose, new ingredients such as more effective surfactants, polymers, enzymes or bleaching agents have preferably been added to the cleaning agents. However, since new ingredients are only available in limited amounts, and the amount of the ingredients used per cleaning stage cannot, be increased to any desired extent for ecological and economic reasons, these solutions are restricted by nature.

[0004] In this context, product developers have recently in particular been studying devices for the multiple dispensing of detergents and cleaning agents. In these devices, it is possible to distinguish between dispensing chambers integrated in the dishwasher or washing machine on the one hand, and separate devices that are independent of the dishwasher or washing machine on the other hand. By means of these devices, which contain several times the amount of cleaning agent required for carrying out a cleaning process, detergent or cleaning agent portions are dispensed into the interior of the cleaning machine, in an automatic or semi-automatic manner, over the course of a plurality of sequential cleaning processes. The user no longer needs to carry out dispensing manually at each cleaning or washing stage.

[0005] The starting point for the teaching of the present invention is a dispensing system according to WO 2010/006761 A2.

[0006] The following embodiments primarily relate to the example of a dishwasher, since the method according to the invention and the dispenser according to the invention can also be used particularly expediently in a dishwasher. However, the embodiments are to be understood very generally, such that they also apply to other devices where similar problems arise, in particular washing machines, which also operate having several rinse stages within a cleaning cycle.

[0007] In the known method from which the invention proceeds (WO 2010/006761 A2), the dispensing unit of the dispensing system firstly comprises a sensor, which is intended and suitable for detecting the water temperature in the dishwasher.

[0008] The progression of the method is mainly controlled by means of the detected water temperature. Thus, the start of the final rinse stage of the dishwasher is detected on account of the water temperature being higher at this point in time than during the normal cleaning stage or intermediate rinse stage.

[0009] In addition to a temperature sensor, the dispenser of the known dispensing system has a sensor for detecting the conductivity, which sensor is outwardly open to the surroundings of the dispenser, in other words accessible for the water inside the dishwasher. In the known dispenser, the conductivity sensor on the base of the dispenser comprises two contacts that are outwardly open to the surroundings and are preferably formed as contact pins projecting downwards from the base. One contact is connected as an anode contact, and the other contact is connected as a cathode contact with respect to the energy source. These contacts can each be encased in an electrically conductive silicone so as to corrode less easily. The spacing of the contacts is typically between 2 and 25 mm.

[0010] The track resistance of the stretch between the two contacts can be determined by means of the control unit, which resistance can be converted into the conductivity of the medium wetting the contacts, in particular the cleaning fluid in the dishwasher. If there is no fluid bridge between the contacts, the conductivity is very low (close to zero). If there is water in the dishwasher, i.e. if a rinse stage is currently taking place, cleaning fluid strikes the conductivity sensor that is outwardly open to the surroundings in the dishwasher, a fluid bridge occurs between the contacts, and the conductivity increases significantly.

[0011] In the prior art discussed above, the control device merely determines, by means of the conductivity sensor, whether water is present in the dishwasher or whether said dishwasher is dry. The actual control of the dispenser over the course of the rinse stages, namely the cleaning stage, intermediate rinse stage and final rinse stage, is carried out, in contrast, by the control unit on the basis of the measurement signals of the temperature sensor.

[0012] The teaching is now based on the problem of configuring the control of the dispenser so as to be more practice-oriented and more sensitive.

[0013] In a method having the features of the preamble of claim 1, the problem set out above is solved by the features of the characterizing part of claim 1.

[0014] The basic concept of the method according to the invention is to control the progression of the method during the rinse stages of the cleaning cycle, namely the cleaning stage, intermediate rinse stage or intermediate rinse stages and final rinse stage, not, or at least not only, by means of the temperature sensor, but rather by using, in addition or primarily, the conductivity sensor and the

measured conductivity values thereof for this purpose.

[0015] It should again be noted that the invention is described here on the basis of the preferred example of a dishwasher. However, use in other devices that have similar problems, in particular in washing machines, is explicitly implied.

[0016] The teaching of the invention is based on the basic understanding that the electrical conductivity in the cleaning fluid is dependent on the concentration of the electrolytes in the cleaning fluid. The conductivity increases as the electrolyte concentration increases. The electrolyte concentration increases when cleaning agent is added to the water and/or when the dirt gradually dissolves in the cleaning fluid. The conductivity reaches its maximum during the cleaning stage as soon as the cleaning agent has been completely dispensed in and dissolved, and all of the dirt has been dissolved and transferred into the cleaning fluid.

[0017] During the further rinse process, the conductivity changes only slightly on account of the temperature of the cleaning fluid rising or falling or on account of diluting processes, for example if fresh water is dispensed in.

[0018] The conductivity changes significantly only when at least some of the water is changed. According to the invention, this substantive matter is exploited in order to thereby control the progression of the method. Specifically, a significant change in the conductivity usually means a change from one rinse stage to the next rinse stage. This applies in particular initially for the transition from the first stage, i.e. the cleaning stage, to the second stage, i.e. the intermediate rinse stage.

[0019] Thus, according to the invention, the control unit determines, by means of the conductivity sensor, the course of the conductivity over time during the progression of the rinse stages. In the process, the gradient of the course of the measured conductivity values is evaluated. A conclusion about a change from rinse stage to rinse stage is only reached when the conductivity not only falls below the maximum conductivity value determined in the first rinse stage, but rather only when the fall in conductivity also occurs at a certain minimum speed, i.e. a certain gradient.

[0020] The second criterion provides great certainty that the change in the conductivity really has occurred on account of a complete water change, and not simply on account of dispensing in small amounts of fresh water.

[0021] In the method according to the invention, the control of the stand-alone dispensing system is made independent of the temperature boundary conditions prevailing during the progression of the dishwashing program. This takes into account the fact that modern detergents can be used at

lower temperatures than was previously usual. The temperature curves over a dishwashing cycle can therefore no longer always be clearly assigned, to the same degree, to the different types of rinse stages. The same applies to modern washing agents, final rinsing agents and softeners for washing machines.

[0022] The teaching of the invention is particularly important when the cleaning fluid is not re-heated during the final rinse stage. This particularly affects those dishwashers that do not require any additional heat energy to be supplied for the drying following the final rinse stage. In this case, moisture is usually instead extracted by means of adsorption or absorption. The high temperature that has been typical in the final rinse stage to date can no longer be identified here, and in this respect the temperature sensor is no longer helpful.

[0023] The further embodiments of the dependent claims, claims 2 to 6, are particularly applicable in particular for detecting the final rinse stage.

[0024] Claims 7 and 8 then also relate to further preferred embodiments and developments of the method according to the invention. According to claim 9, the method according to the invention is carried out and the corresponding process steps are initiated by the program control of a program-controlled electronic control unit.

[0025] In a dispenser according to the invention, the control unit is thus programmed so that, during operation in a dishwasher, it is able to execute the process steps set out above.

[0026] The invention will now be explained in more detail in the following on the basis of drawings showing an embodiment that is merely preferred. In the drawings:

Fig. 1 is a schematic view of a large appliance, shown here as a dishwasher, comprising a dispensing system according to the invention arranged in a drawer,

Fig. 2 shows the dispensing system from Fig. 1, once when the cartridge is removed from the dispenser and once when the cartridge is coupled to the dispenser,

Fig. 3 shows a specific embodiment of a dispensing system according to the invention, when the cartridge is still removed from the dispenser,

Fig. 4 is a flow diagram of a dishwashing cycle based on the course of the measured conductivity values in the cleaning fluid.

[0027] Fig. 1 first shows a large domestic appliance, in this case in the form of a dishwasher 1,

comprising an interior that is accessible in this depiction on account of the front door 2 that is folded down to the outside. In the interior, there is a drawer 3, shown as a basket for receiving crockery, in which a dispensing system 4 according to the invention is located. It is possible to see that the dispensing system 4 can, in principle, be positioned at any desired position inside the drawer 3 of the dishwasher 1. In this case, it is advantageous for the dispensing system 4 to be formed in a manner similar to a plate so that it can be put into a corresponding plate holder of the drawer 3.

[0028] In Fig. 1, a dispensing chamber on the front door 2 of the dishwasher 1 is indicated, into which chamber a cleaning tablet or the like can be inserted. However, if the dispensing system 4 according to the invention is located in the interior of the dishwasher 1, it is not necessary to use the dispensing chamber, since the detergent or cleaning agent is released by the dispensing system 4 into the interior of the dishwasher.

[0029] Fig. 2 is the fundamental, basic view of the dispensing system 4.

[0030] The dispensing system 4 shown in this figure comprises, at the bottom, a dispenser 5 comprising a housing 6. Dashed lines on the right-hand side of the housing 6 in Fig. 2 indicate an energy source 7, typically a battery or an accumulator, and dashed lines beside said energy source on the left-hand side indicate an electronic control unit 8, typically provided with a microprocessor or a microcontroller and conventional additional modules of a control unit of this kind. Display and/or operating elements 9 are indicated on the front of the housing 6, which elements can display the operating state of the dispenser 5 and/or influence said state.

[0031] A connection portion 10, in this case in the form of a peripheral edge, for removably coupling of a cartridge 11 shown above the dispenser 5, can be seen at the top of the housing 6 of the dispenser 5. Said cartridge 11 is therefore shown here as still being removed from the dispenser 5. The cartridge 11 has at least one cartridge chamber 12. In the shown and preferred embodiment, the cartridge 11 has two cartridge chambers 12 so that two different flowable detergents or cleaning agents can be supplied.

[0032] WO 2010/006761 A2 explains very extensively why these detergents or cleaning agents are typically used, and what the compositions are. Reference is made to the prior art in this respect too.

[0033] Outlet orifices 13 of the cartridge chambers 12 are located at the bottom of the cartridge 11, on each of the two cartridge chambers 12.

[0034] Dispensing chamber inlets 14 on the top of the housing 6 of the dispenser 5 correspond to the outlet orifices 13 of the cartridge chambers 12 of the cartridge 11. The dispensing chamber

inlets 14 further comprise means that cause the outlet orifices 13 to open when the cartridge 11 is plugged/coupled onto the housing 6 of the dispenser 5 so that, when the cartridge 11 and dispenser 5 are in the coupled state, the inside of the cartridge chambers 12 are connected to the dispensing chamber inlets 14 so as to communicate.

[0035] Fig. 2 shows, on the right-hand side, the situation that arises when the cartridge 11 is coupled onto the dispenser 5. In this case, the dispensing system 4 is complete and operational.

[0036] Fig 3. shows an embodiment of a dispensing system 4 that is closer to the situation in practice. In this figure, more specific details of the different cartridge chambers 12 of the cartridge 11, the outlet orifices 13, and the dispensing chamber inlets 14 can also be seen. In particular, in Fig. 3, it is possible to see the dispensing chambers 15 comprising associated actuators 16 and closure elements 17 below the dispensing chamber inlets 14 in the dispenser 5. This is all described in detail in WO 2010/006761 A2, and so no additional, more detailed explanation is required here.

[0037] In Fig. 3, the control unit 8 comprising the energy source 7 can also be seen in the left-hand half of the housing 6 of the dispenser 5, all of which elements are shown schematically.

[0038] A conductivity sensor 18 is indicated on the base of the housing 6 of the dispenser 5 in Fig. 3. This conductivity sensor 18 is in the form of contacts that are guided towards the outside and which, according to the preferred teaching of the invention, are encased in an electrically conductive silicone in order to be protected from corrosion. These contacts are connected, towards the inside, to the energy source 7 and the control unit 8 in terms of circuitry so that the corresponding conductivity measurement can be carried out by the contacts of the conductivity sensor 18 in the cleaning fluid in the dishwasher.

[0039] The basic design of the conductivity measurement in the dispenser 5 according to the invention is known from the prior art discussed above, and does not require any further explanation here. Rather, reference can be made in this respect to WO 2010/006761 A2.

[0040] This document relates to the method by which the dispenser of the dispensing system 4 is controlled during a rinse cycle when in use in a dishwasher. This control is ensured by the control unit 8.

[0041] According to the method according to the invention, it is provided that, during the running of a cleaning cycle, i.e. in this case a dishwashing cycle, with at least two different rinse stages $S_1$, $S_2$, the measured conductivity value L, currently detected by the conductivity sensor 18, is determined continuously or discontinuously by the control unit 8, that the sequence of determined

measured conductivity values L is evaluated by the control unit 8 with respect to the course of the absolute value of the conductivity and with respect to the gradient of the course dL/dt of the conductivity, and that, when the currently measured conductivity value L falls below a maximum measured conductivity value $L_{max}$ determined in the first rinse stage $S_1$ and the gradient of the course dL/dt of the measured conductivity value exceeds a certain threshold D, this is evaluated by the control unit 8 as a water change and the start of the next rinse stage $S_2$.

[0042] Fig. 4 shows the typical course of the conductivity L in the cleaning fluid in a dishwasher during a dishwashing cycle.

[0043] At the start, no water has yet flowed into the inside of the dishwasher 1, the conductivity sensor 18 is dry, and the measured conductivity value is virtually zero. This is because the track resistance between the contacts of the conductivity sensor 18 is extremely high; there is virtually no air gap.

[0044] Fresh water now flows into the inside of the dishwasher 1. The rinse arms of the dishwasher start to rotate, and cleaning fluid, in this case water which is still substantially clean, strikes the conductivity sensor 18. The conductivity rapidly increases to the typical conductivity for fresh water.

[0045] The control unit 8 has thus determined, initially by means of the conductivity sensor, that the dishwasher is now operating. A time-measuring function of the control unit 8 can therefore be carried out so that the point in time can be found at which the first cleaning agent needs to be dispensed into the cleaning fluid. In parallel thereto, the temperature sensor (not mentioned further here) detects whether the cleaning fluid in the dishwasher 1 has already reached the correct temperature for optimal cleaning using the first cleaning agent.

[0046] If the first cleaning agent is dispensed into the cleaning fluid - point R - this leads to a rapidly increasing electrolyte concentration. The conductivity that is measured by the conductivity sensor 18 increases rapidly. This can be seen very clearly at this point in Fig. 4.

[0047] During the further cleaning stage, dirt dissolves, the temperature ratios change slightly, and the measured conductivity values (L) change slightly. This can be seen from the relatively constant, flat course of the curve of the measured conductivity values (L) in Fig. 4.

[0048] At the end of the cleaning stage, the dirty cleaning fluid is pumped away. The measured conductivity value L determined by the conductivity sensor drops rapidly, and falls with a gradient dL/dt that is significantly greater than a previously set threshold D. This is evaluated by the control unit 8 as the end of the cleaning cycle. The dispenser 5 now "knows" that it is entering the next

rinse stage $S_2$, i.e. the intermediate rinse stage.

[0049] On the right-hand side of Fig. 4, it is possible to see that, at the end of the last rinse stage $S_3$, i.e. the final rinse stage, the cleaning fluid that is mixed with final rinsing agent has now finally been pumped out of the dishwasher 1. The conductivity sensor 18 is dry again, and the measured conductivity value L has dropped to virtually zero. The dispenser 5 recognizes, after a certain time that is to be defined by a predefined time window, that the entire dishwashing cycle has now finished.

[0050] According to the invention it is further provided, according to preferred teaching, that when, after the start of a second rinse stage $S_2$, it is again detected by the control unit 8 that the gradient of the course dL/dt of the conductivity (L) exceeds the threshold D or another threshold D' stored for the second rinse stage $S_2$, this is evaluated by the control unit 8 as a water change and the start of the next rinse stage $S_3$. Since, in all likelihood, no measured conductivity value L will occur in the intermediate rinse stage, even when a cleaning agent needs to be dispensed in again, that is as high as that in the cleaning stage, it is also possible that another threshold D' may be used for the gradients, in order to determine the next change to the third rinse stage.

[0051] In some cleaning cycles there is not only one intermediate rinse stage, but rather a plurality of intermediate rinse stages. In order to distinguish a further intermediate rinse stage from the last rinse stage, i.e. the final rinse stage, it is possible for further criteria to be taken into account within the scope of the method according to the invention.

[0052] During the final rinse stage, it is necessary to trigger the dispensing of a further cleaning agent, i.e. in this case the drying and final rinsing agent. According to another preferred teaching, it is the case in this particular situation that a minimum measured conductivity value $L_{min}$ is predefined in the control unit 8 or determined and stored by the control unit 8 and it is evaluated by the control unit 8 as the start of the last rinse stage $S_3$, i.e. the final rinse stage, only when in addition the minimum measured conductivity value $L_{min}$ is undershot. A first possibility for determining a suitable minimum measured conductivity value $L_{min}$ consists in determining and storing this value at the start of the cleaning cycle, i.e. when there is clear fresh water in the dishwasher. A further possibility also consists in determining and storing the minimum measured conductivity value $L_{min}$ when a change from the first rinse stage $S_1$ to the second rinse stage $S_2$ occurs. The latter possibility has the advantage of usually making the control process even less susceptible to errors.

[0053] Thus, if the control unit 8 of the dispenser 5 has detected that there has been a cleaning stage and that the intermediate rinse stage has now also finished, the dispenser 5 can now trigger the dispensing of the final rinsing agent and/or drying agent, independently of the temperature in

the cleaning fluid or in the inside of the dishwasher 1. In this case, the minimum measured conductivity value $L_{min}$ can be predefined in the control unit 8 from the start, or can result from the minimum measured conductivity value determined during the transition from the cleaning stage to the intermediate rinse stage and stored by the control unit 8. The variant selected depends on the practical check.

[0054] In order to be certain that the last, i.e. final rinse stage, really has now begun, it may be advisable to also introduce a further criterion, specifically to provide that it is evaluated by the control unit 8 as the start of the last rinse stage $S_3$, i.e. the final rinse stage, only when the minimum measured conductivity value $L_{min}$ is undershot and is again exceeded by the currently measured conductivity value (L) within a predefined time window after the undershooting of the minimum measured conductivity value $L_{min}$. This prevents the dispenser 5 from inadvertently dispensing in the final rinsing agent and/or drying agent when the dishwashing cycle has ended prematurely or as intended.

[0055] In principle, the measured conductivity values L can be determined in a different manner using the conductivity sensor 18. The measured conductivity values L are preferably determined by means of a discrete, discontinuous measurement by the control unit 8 at the conductivity sensor 18. Empirical values have shown that it is expedient for at least 100, preferably at least 200, conductivity measurements or resistance measurements to be made per second by the control unit 8 by means of the conductivity sensor 18.

[0056] In order to prevent polarization effects, it is further advisable for a polarity reversal to occur at the conductivity sensor 18 after each conductivity measurement or each specific number of conductivity measurements.

[0057] The explanations above have already made it clear that, primarily, it is necessary to proceed from a program-controlled electronic control unit 8 that corresponds to the current modern stage of development, and will, as a rule, contain a microprocessor or microcontroller. Of course, the control unit 8 also has corresponding further modules, in particular electronic data memories.

[0058] It is therefore advisable according to the invention for it to be a program-controlled electronic control unit 8 and for the process steps to be executed or initiated by the program of the control unit 8.

[0059] As has already been set out above, the invention also relates to a dispenser 5 *per se*, the control unit 8 of which is programmed so that the process steps described above can be executed.

714519/ZSO

# FOLYÓKÉPES MOSÓ- VAGY TISZTÍTÓSZERT ADAGOLÓ ESZKÖZ VEZÉRLÉSÉRE SZOLGÁLÓ ELJÁRÁS

## SZABADALMI IGÉNYPONTOK

1. Eljárás folyóképes mosó- vagy tisztítószert adagoló, önálló rendszer adagolóeszközének (5) vezérlésére, előnyös módon mosogatógépben való alkalmazásra,

amely adagolórendszer (4) az adagolóeszközből (5) és egy tárolótartályból áll legalább egy mosó- vagy tisztítószer számára, amely tárolótartály különösen az adagolóeszközhöz (5) oldhatóan kapcsolt patronként (11) van kivitelezve,

és amely adagolóeszköznek (5) van egy háza (6), a házban (6) legalább egy energiaforrása (7), legalább egy működtető szerve (16) az adagolás végrehajtására és egy elektronikus vezérlőegysége (8) legalább a működtető szerv (16) vezérlésére, valamint a házon (6) egy, a vezérlőegységgel (8) kapcsolástechnikailag összekötött, az adagolóeszköz (5) környezete felé nyitott vezetőképesség érzékelője (18),

azzal jellemezve,

hogy egy, legalább két különböző mosogató fázisból ($S_1$, $S_2$) álló tisztítási ciklus folyamán a vezérlőegység (8) folyamatosan vagy szakaszosan meghatározza a vezetőképesség érzékelő (18) által aktuálisan megállapított vezetőképesség értéket (L),

hogy a vezérlőegység (8) kiértékeli a meghatározott vezetőképesség értékek (L) sorozatát a vezetőképesség (L) abszolút értékének alakulására vonatkozóan, valamint a vezetőképesség alakulásának gradiensére (dL/dt) vonatkozóan, és

hogy, ha az aktuálisan mért vezetőképesség érték (L) nem éri el az első mosogató fázisban ($S_1$) meghatározott maximális vezetőképesség értéket ($L_{max}$), és a vezetőképesség érték alakulásának gradiense (dL/dt) átlép egy meghatározott határértéket (D), akkor ezt a vezérlőegység (8) vízváltozásként és a következő mosogató fázis ($S_2$) kezdeteként értékeli.

2. Az 1. igénypont szerinti eljárás, azzal jellemezve, hogy ha a második mosogató fázis ($S_2$) kezdete után a vezérlőegység (8) újból megállapítja, hogy a vezetőképesség alakulásának gradiense (dL/dt) átlépte a határértéket (D) vagy egy másik, a második mosogató fázisra ($S_2$) vonatkozó határértéket (D'), akkor ezt a vezérlőegység (8) vízváltozásként és a következő mosogató fázis ($S_3$) kezdeteként értékeli.

3. A 2. igénypont szerinti eljárás, azzal jellemezve, hogy a vezérlőegységben (8) előre megadunk, vagy a vezérlőegység (8) meghatároz és eltárol egy minimális vezetőképesség értéket ($L_{min}$), és hogy ezt a vezérlőegység (8) csak akkor értékeli az utolsó mosogató fázis ($S_3$), az öblítő fázis kezdeteként, ha ezen kívül a minimális vezetőképesség értéket ($L_{min}$) sem éri el.

4. A 3. igénypont szerinti eljárás, azzal jellemezve, hogy a minimális vezetőképesség értéket ($L_{min}$) a tisztítási ciklus első mosogató fázisának ($S_1$) kezdetekor a vezérlőegység (8) meghatározza és eltárolja.

5. A 3. igénypont szerinti eljárás, azzal jellemezve, hogy a tisztítási ciklus első mosogató fázisáról ($S_1$) a második mosogató fázisra ($S_2$) történő váltáskori minimális vezetőképesség értéket ($L_{min}$) a vezérlőegység (8) meghatározza és eltárolja.

6. A 3-5. igénypontok egyike szerinti eljárás, azzal jellemezve, hogy ezt a vezérlőegység (8) csak akkor értékeli az utolsó mosogató fázis ($S_3$), az öblítő fázis kezdeteként, ha az aktuális vezetőképesség érték (L) nem éri el a minimális vezetőképesség értéket ($L_{min}$), és egy előre megadott időablakon belül a minimális vezetőképesség érték ($L_{min}$) alatt maradás után azt újból átlépi.

7. Az előző igénypontok egyike szerinti eljárás, azzal jellemezve, hogy másodpercenként legalább 100, előnyös módon legalább 200 vezetőképesség mérést, illetve ellenállás mérést végzünk a vezérlőegység (8) révén a vezetőképesség érzékelővel (18).

8. Az előző igénypontok egyike szerinti eljárás, azzal jellemezve, hogy minden vezetőképesség mérés vagy minden, meghatározott számú vezetőképesség mérés után a vezetőképesség érzékelőn (18) pólusváltás történik.

9. Az előző igénypontok egyike szerinti eljárás, azzal jellemezve, hogy programvezérelt elektronikus vezérlőegységről (8) van szó, és az eljárási lépéseket a vezérlőegység (8) programja hajtja végre vagy indítja el.

10. Adagolóeszköz folyóképes mosó- vagy tisztítószert adagoló, önálló rendszerhez (4), előnyös módon mosogatógépben való alkalmazásra, egy házzal (6), a házban (6) legalább egy energiaforrással (7), legalább egy működtető szervvel (16) az adagolás végrehajtására, egy elektronikus vezérlőegységgel (8) legalább a működtető szerv (16) vezérlésére, valamint a házon egy, a vezérlőegységgel (8) kapcsolástechnikailag összekötött, az adagolóeszköz (5) környezete felé nyitott vezetőképesség érzékelővel (18), azzal jellemezve, az adagolóeszköz (5) vezérlőegysége (8) úgy van programozva, hogy az adagolóeszköz (5) üzemelésekor az 1-9. igénypontok egyike szerinti eljárás eljárási lépéseit hajtja végre vagy indítja el.

(A meghatalmazott)

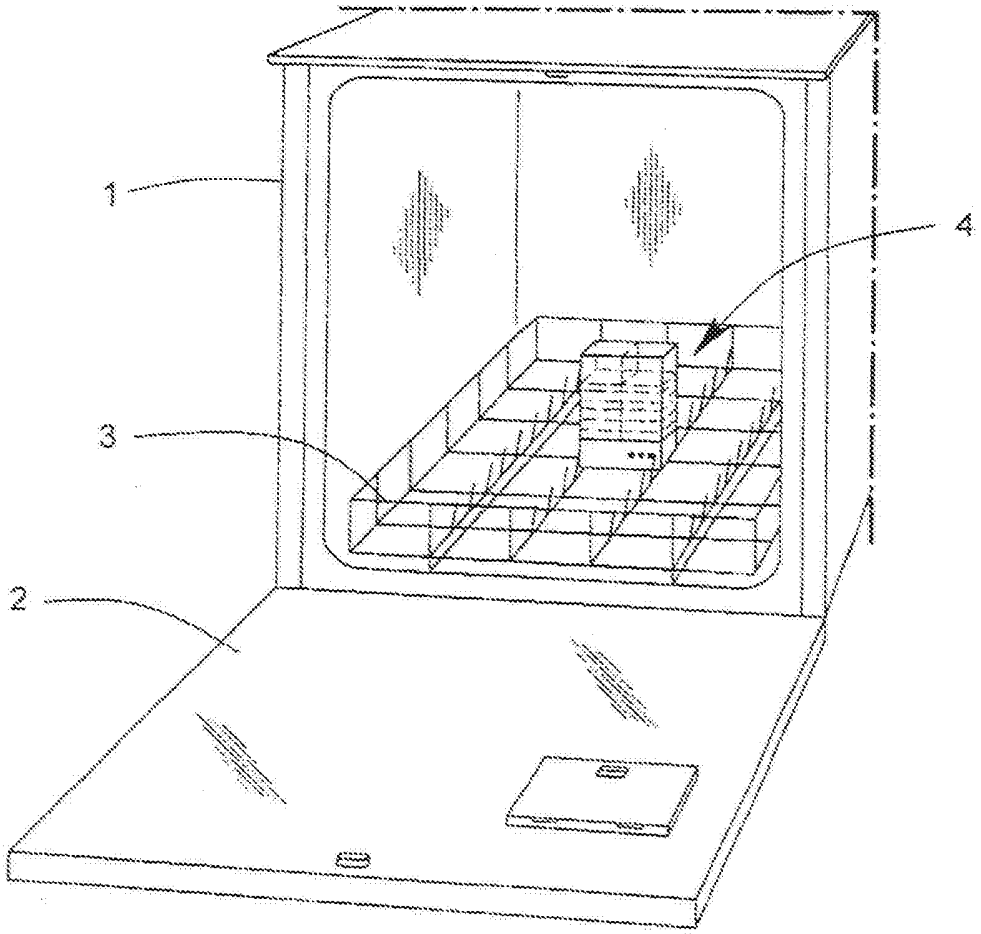


Fig. 1

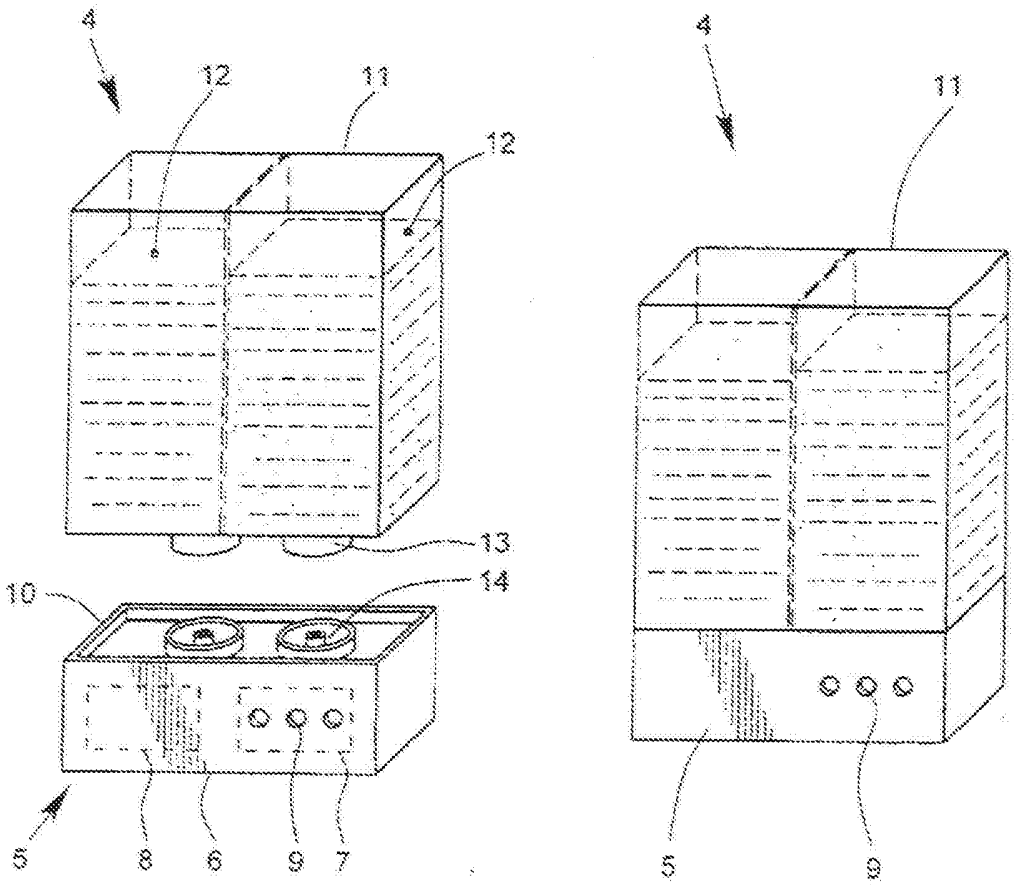


Fig. 2

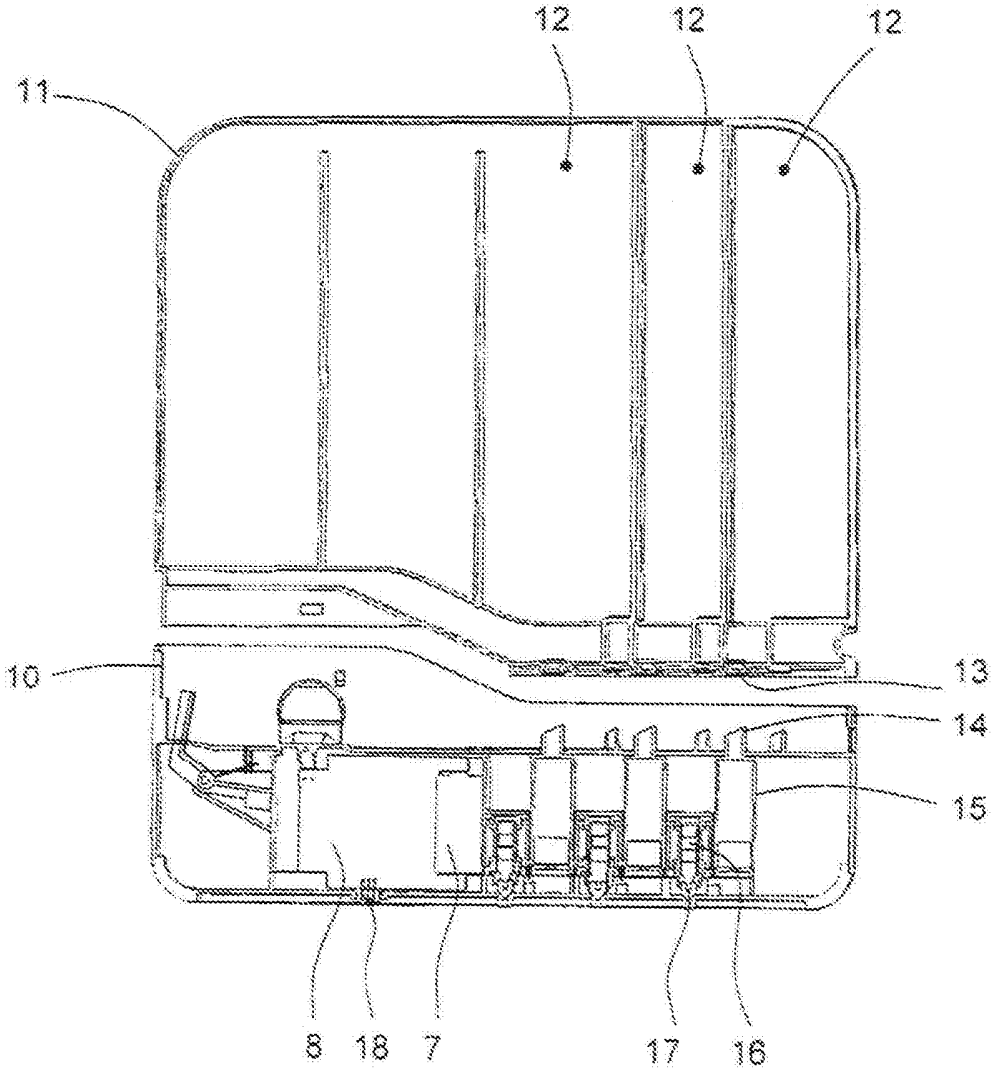


Fig. 3

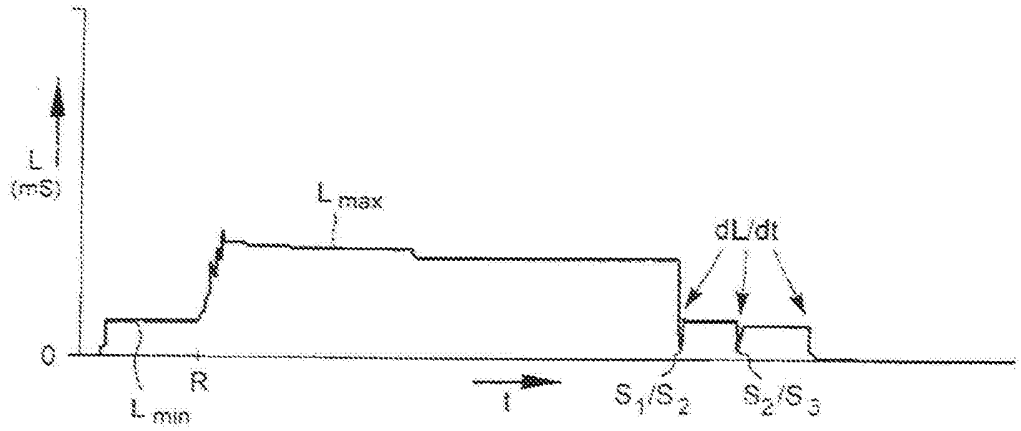


Fig. 4