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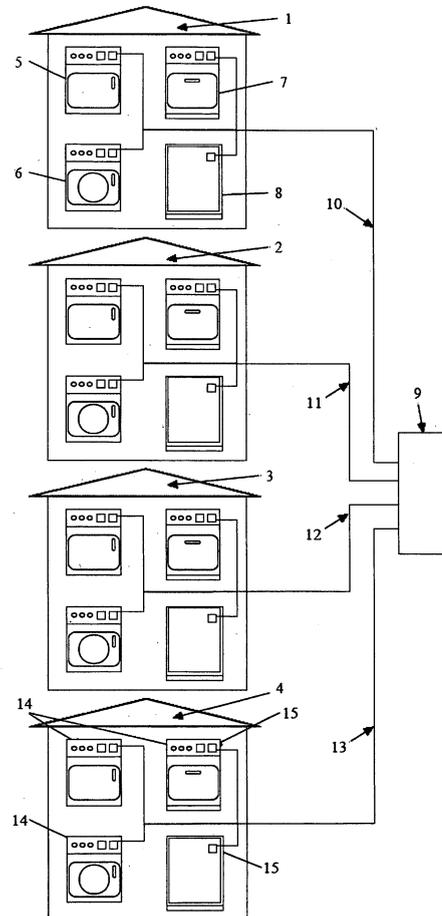
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(54) **Network of programme-controlled household appliances**

(57) A program controlled household appliance (5,6,7,8) comprising a user interface (14,15) that permits the user to select a program or a series of program steps is provided with means to adapt the execution of the program. The appliance may be part of a network comprising at least one service station.



Drawing

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## Description

**[0001]** The invention pertains to a program-controlled household appliance comprising a user interface that permits the user to select a program or a series of program steps.

**[0002]** A multiplicity of household appliances with program control is known. Especially, dishwashers, in which the program steps are variable depending on the degree of opaqueness of the washing solution are disclosed e. g. by DE 42 43 868 C2 and DE 42 19 276 A1. These washing programs are generally designed as universal programs, i. e.; they adapt to the particular ascertained dirtiness of the washing solution and, for successful cleaning of the items to be washed, are supposed to deal with all types of soiling that occur. This, however, is not in any way assured for all types of soiling.

**[0003]** Essentially, two types of soiling can be distinguished. On the one hand, there is an easily cleaned domestic soiling. The soiling can then be cleaned relatively easily with a small expenditure of time, temperature, and water. Such soiling occurs, for example, in the case of cold foodstuffs or in the case of foodstuff residues, which have not dried on. The second type of household soiling can be cleaned only with difficulty, e. g. in the case of foodstuff residues which have burned on or which have dried on the items to be washed over a long period of time.

**[0004]** The disadvantages of the known methods with optical detection of the opaqueness of the washing solution is that soiling which is not yet present in the washing solution is invisible to the sensor. A further disadvantage is the inadequate measurement resolution.

Burned-on soiling residues, which are gradually released from the items to be washed, are very small by comparison with the soiling, which is already released, and therefore cannot be measured in the majority of cases. Due to these disadvantages, in the case of the known methods the washing process must always be designed so that even hard, burned-on soiling is cleaned. Consequently, the washing programs cannot be optimised to a minimum amount of time, temperature and water consumption by means of sensor control. Otherwise, a satisfactory cleaning result would not be achieved in the case of burned-on soiling.

**[0005]** According to EP 0 972 487 B1 a method is created which takes into account the time, temperature and, water consumption. It comprises a first program structure that can be selected for easily cleaned domestic soiled items and a second program structure that can be selected for burned-on and/or dried-on domestic soiled items, whereby the degree of opaqueness of the washing solution is measured by means of an optical sensor according to transparency and foam formation of the washing solution. In the first program structure at least the washing duration is variable in the program steps, according to those measures. In the second program structure, the washing solution is heated, at least in the pre-washing to a defined temperature according to those

measures.

**[0006]** It the object of the present invention to create a new household appliance with improved cleaning qualities.

5 **[0007]** This object is achieved, according to the invention, in that means are provided to adapt the execution of the program.

**[0008]** According to the invention, the customer can choose with which program he wants to clean the soiled dishes without the necessity of reading a manual and without any special knowledge which program should be normally used for his purposes as the household appliance itself contains means to recognize the status of the product to treat in it.

10 **[0009]** In case of a dishwasher this means that the dishwasher comprises means to measure the soiling of the dishes' and to adapt the program according to the degree of soiling of the dishes. Therefore, the household appliance accomplishes its functions in a more comfortable way than household appliances of the state of the art.

15 **[0010]** In case of a washing machine this means that the degree of pollution of the clothes is measured, e. g. by a turbidity sensor, and that the program, e. g.. its duration or the temperature are adapted to the degree of soiling.

20 **[0011]** In case of a kitchen stove the baking of a roast may be supervised by a temperature sensor, and the course of temperature during baking may be controlled by a program.

25 **[0012]** Advantageous embodiments and designs of the invention are contained in the dependent claims, in the description and in the drawings, with combinations not limited to expressly stated ones.

30 **[0013]** In a preferred embodiment of the invention, the household appliance is provided with feedback means reacting on the needs of the user. Therefore, the appliance may comprise a button that lets the choice to the customer to use a preconfigured menu or to connect the appliance to the network so that the station centre can select the most appropriate program, especially when taking into account data provided by sensors that are installed in the household appliance. In case of a dishwasher this may be a turbidity sensor, and a weight sensor may record the weight of the dishes to adapt the quantity of water necessary to clean them.

35 **[0014]** Furthermore, the household appliance according to another embodiment of the invention comprises a self-learning electronic control system.

40 **[0015]** Further, the present invention pertains to a household appliance wherein the user interface comprises at least one button for implementing a change of at least of one the programs executable by the household appliance.

45 **[0016]** Advantageously, the household appliance makes part of a network comprising at least one service station that helps the customer in case of problems of the machine or if the customer has special wishes. On

the other hand the service centre may invite the customers connected to it to let it know their wishes and ideas.

**[0017]** Preferably, the household appliance comprises means, especially alphanumerical means, to enter any messages with respect to the household appliance and its functions to be transmitted to the service station.

**[0018]** In another preferred embodiment, the household appliance comprises a display, especially an LCD-display, to indicate any information for the customer from the machine or from the service station. In addition, the customer may read on the display the information he wants to transmit to the service station. Especially, the customer may send information to the service station that he inputs by means of a keyboard connected to the household appliance. The customer can inform the service station why he is not satisfied with any of the functions and programs of the household appliance. If the household appliance is connected to a network

**[0019]** Furthermore, the household appliance and its functions are analyzable and/or controllable and/or repairable and/or adjustable from the service station, especially according to any data entered by the user.

**[0020]** The invention also pertains to a method for the operation of a household appliance specified above.

**[0021]** The method is characterised therein that the user enters data to the household appliance that correspond to a change or to a modification of the program the user intends to obtain.

**[0022]** In a further preferred method the customer may, after running a program cycle, if he is not satisfied with the result of the program, push a feedback-button and the machine learns by communication with the service centre and/or by its self-learning system to change any of its working parameters. In case of a dishwasher or a washing machine the working parameters may be cleaning parameters, especially the temperature, the drying duration, for the next program cycle. Thus makes superfluous telephone calls of the customer to a service station.

**[0023]** Preferably, the user applies an operating means of the user interface to enter the data.

**[0024]** In a preferred method the user enters temperature, drying duration, the quantity of detergent, etc. or any other washing parameter to apply that parameter for the next washing cycle.

**[0025]** According to another preferred method the household appliance applies standardized programs as long as they are not changed by the service centre the household appliance is connected with.

**[0026]** Preferably, any change of any of the programs of the household appliance introduced by the service centre is communicated to the customer.

**[0027]** Advantageously, any change of any of the programs corresponds to a wish of the user or is caused by technical reasons or any improved teaching to use of the household appliance communicated by the service centre. Any information of the service station for the user may be displayed on a display, especially on a panel connected to the household appliance or at any other

central place of the household.

**[0028]** If a household appliance is connected to a network, the given information can be directly transferred to the service centre and can be directly adjusted by the service centre via the network. Another possibility consists in beginning with a standardized cycle: as long as the customer gives no negative feedback the program parameters are changed subsequently to reduce energy costs. In case of a dishwasher the consumption values as water, energy, time, ..., are decreased; so the most effective individual program can be created for a single household. On the other hand, the consumption parameters are increased if the customer gives a negative feedback. The changes introduced by the service centre via the network may be communicated to the customer to give him the impression that everything has been done to fulfil his expectations.

**[0029]** The invention has the advantage that the household appliance reacts on inputs given by the customer and so this self-learning machine can reduce service calls. An individual program for running the household appliance may be created by the service centre. Feedback between the household appliance and the service centre is possible by direct communication.

**[0030]** An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawing, which shows a schematic view of a plurality of household appliances in different households connected to a common service station.

**[0031]** A plurality of households 1, 2, 3, 4 is equipped with different household appliances as a dishwasher 5, a washing machine 6, a kitchen stove 7, and a refrigerator whereby different other household appliances may be foreseen in some or all of the households 1 through 4.

**[0032]** Each of the households 1 through 4 is connected with a service station 9 by bidirectional data and control busses 10, 11, 12, and 13 that transmit data between the station 9 and the appliances 5 through 8 in each of the households 1 through 4.

**[0033]** As the appliances 5 through 8 are equipped with different sensors, as weight sensors, temperature sensors, turbidity sensors, etc., actors as drive motors, fans, pumps, heatings; displays 14 and control elements 15 control data from the service station 9 are proceeded in the appliances 5 through 8 according to control commands of the service station 9. On the other side service station 9 receives data of the programs and processes running in the appliances 5 through 8 and evaluates them to correct and improve the working of them whereby the consumers of the appliances 5 through 8 may insert their wishes by means of keyboards or other control elements integrated in the service panels of them.

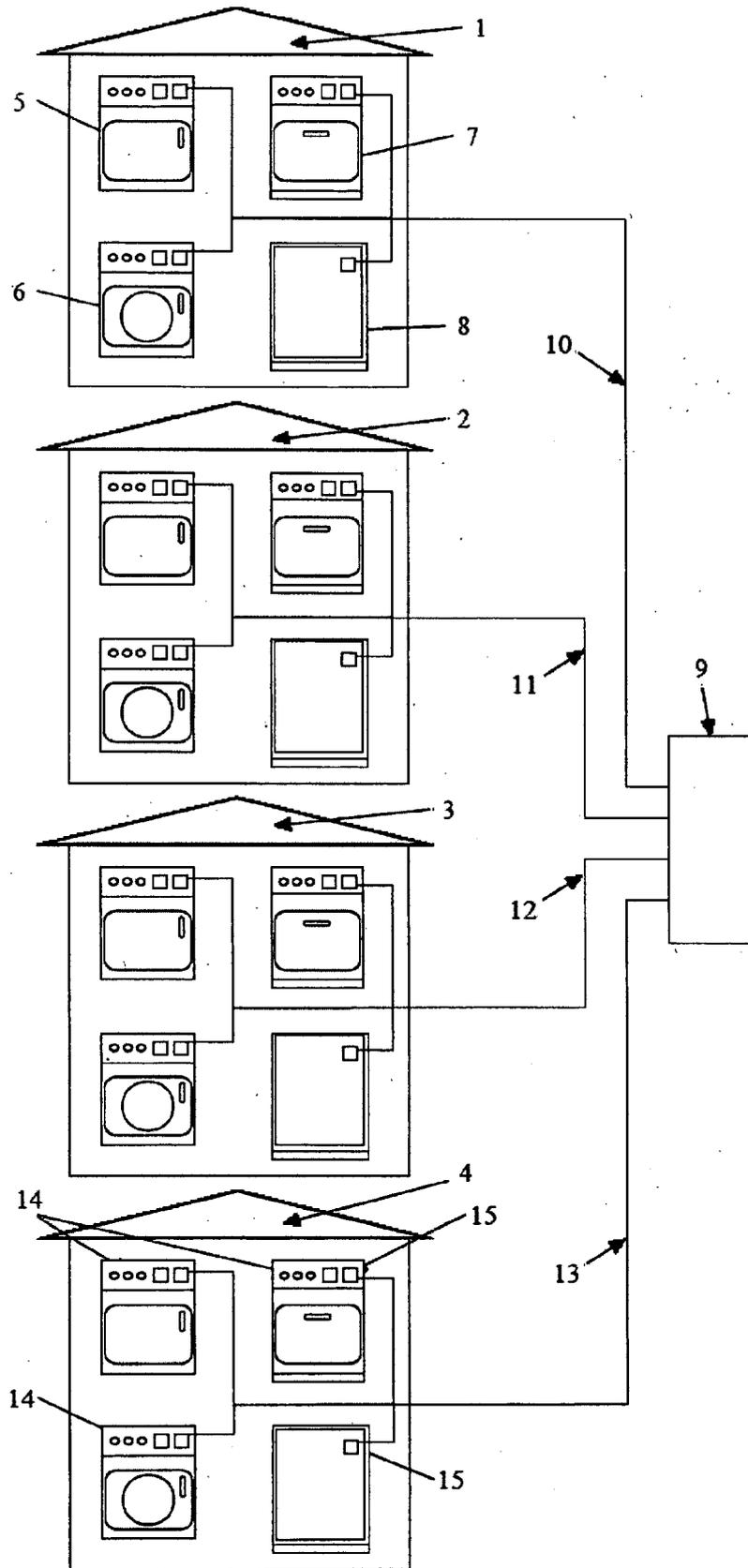
**[0034]** Such wishes are then taken into consideration by the control means of the services station if they are convenient to improve the working of the appliances 5 through 8.

**[0035]** According to the present invention telephone calls between the customers and the service station are

made superfluous all information being transmitted by the data and control busses 10 through 13.

### Claims

1. A program controlled household appliance (5, 6, 7, 8) comprising a user interface (14, 15) that permits the user to select a program or a series of program steps wherein means are provided to adapt the execution of the program.
2. The household appliance (5, 6, 7, 8) according to claim 1, wherein the household appliance (5, 6, 7, 8) is provided with feedback means reacting on the needs of the user.
3. The household appliance (5, 6, 7, 8) according to claim 1 or 2, wherein the household appliance (5, 6, 7, 8) comprises a self-learning electronic control system.
4. The household appliance (5, 6, 7, 8) according to any of claims 1 through 3, wherein the user interface (14, 15) comprises at least one button for implementing a change of at least of one the programs executable by household appliance (5, 6, 7, 8).
5. The household appliance (5, 6, 7, 8) according to any of claims 1 through 4, wherein the household appliance (5, 6, 7, 8) makes part of a network comprising at least one service station (9).
6. The household appliance (5, 6, 7, 8) according to claim 5, wherein the household appliance (5, 6, 7, 8) comprises means especially alphanumeric means to enter any messages with respect to the household appliance (5, 6, 7, 8) and its functions to be transmitted to the service station (9).
7. The household appliance (5, 6, 7, 8) according to any of claims 1 through 6, wherein the household appliance (5, 6, 7, 8) comprises a display (15), especially an LCD-display, to indicate any information for the customer from the household appliance (5, 6, 7, 8) or from the service station (9).
8. The household appliance (5, 6, 7, 8) according to any of claims 5 through 7, wherein the household appliance (5, 6, 7, 8) and its functions are analyzable and/or controllable and/or repairable and/or adjustable from the service station (9), especially according to any data entered by the user.
9. A method for the operation of a household appliance (5, 6, 7, 8) according to any of claims 1 through 8, wherein the user enters data to the household appliance (5, 6, 7, 8) that corresponds to a change or to a modification of the program the user intends to obtain.
10. The method of claim 9, wherein, after running a program cycle, the customer, if he is not satisfied with the result of the program pushes a feedback-button and the household appliance (5, 6, 7, 8) learns by communication with the service centre (9) and/or by its self-learning system to change any of the cleaning, cooking or refrigerating parameters, especially the temperature, the drying duration, etc. for the next program cycle.
11. The method according to claim 10, wherein the user applies an operating means of the user interface to enter the data.
12. The method of claim 11, wherein the user enters temperature, drying duration, the quantity of detergent, etc. or any other washing parameter to apply that parameter for the next washing cycle.
13. The method according to any of claims 9 through 12 wherein a household appliance applies standardized programs as long as they are not changed by a service centre (9) the household appliance is connected with.
14. The method according to any of claims 9 through 13 wherein any change of any of the programs of the household appliance (5, 6, 7, 8) introduced by the service centre is communicated to the customer.
15. The method according to claim 11 wherein any change of any of the programs corresponds to a wish of the user or is caused by technical reasons or any improved teaching to use of the household appliance communicated by the service centre (9).
16. The method according to any of claims 9 through 15 wherein the household appliance (5, 6, 7, 8) begins with a standardized cycle as long as the customer gives no negative feedback and wherein the program parameters are changed subsequently to reduce energy costs.



Drawing



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1	Place of search Munich	Date of completion of the search 16 March 2006	Examiner Papadimitriou, S
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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			



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