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(54) **Diagnostic method for washing machines**

(57) The method of the present invention is a diagnostic method developed for washing machines. In this method, the buttons on the washing machine control panel are activated by a combination known only by the serv-

ice staff; then a washing program is started; and then machine operating parameters, measured instantly by machine equipment, are shown on the display screen.

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**Description****Technical Field**

[0001] Present invention relates to a control method for diagnosing and fixing malfunctions in washing machines, which is applied using the features of a machine.

**Prior Art**

[0002] Washing machines are conventionally transported by service staff, for diagnosing and fixing any malfunction, to a service center where they are repaired and maintained by proper tools and equipment. Apart from that, certain machines which have a display screen may show an error message for the user or the service staff.

[0003] The published patent application No CN101429721 of the prior art discloses a washing machine comprising an LCD display which shows operation, error and safety information as well as washing program parameters of the machine. Said information and parameters mentioned in this patent application are the very same information and parameters included in operating manuals of current washing machines and intended for users. Said application discloses that the users can see such information on the display without resorting to the operating manual. According to the method disclosed in this application, for instance, an error message will be indicated to the user and technical service will be demanded if the washing machine cannot adequately heat the wash water. In other words, this method intends only to guide the end user. In such cases, the user will call the service staff that will come in order to take the machine to the service center for further examination.

[0004] In the washing machines of the prior art; instant water temperature, instant rotational speed of the drum, instant water level, instant motor current and such parameters received from all of the components cannot be viewed by the users although they are collected at the electronic card of the machine. A variety of devices are connected to the machine in order to access these data and perform measurement. These measuring devices usually are not portable and the machine therefore must be transported, for example, to the service center, equipped with measuring devices, where the machines are tested. This procedure takes time and increases cost.

**Brief Description of the Invention**

[0005] The method of the present invention is a diagnostic method developed for washing machines. In this method, the buttons on the washing machine control panel are activated by a combination known only by the service staff; a washing program is started; and then machine operating parameters, measured instantly by machine equipment, are shown on the display screen. This allows the service staff to diagnose malfunctions of the machine at user's home without taking the machine to the service

center.

**Objective of the Invention**

[0006] The aim of this invention is to diagnose and fix malfunctions by means of the information shown on the displays provided on washing machines.

[0007] Another aim of the invention is to ensure that machine operation parameters can be viewed directly via machine display screen, which are to be used by the technical service staff, without employing any additional device and transporting the machine to another location.

[0008] Another aim of the invention is to provide a reliable method for diagnosing and fixing malfunctions, which is simple and cheap to apply.

**Disclosure of the Invention**

[0009] The method of the invention has been developed for the technical service staff to diagnose and fix malfunctions using the features of the washing machine. According to the method, the buttons on the control panel of the machine are activated by a combination (for instance, hitting and/or switching over) known only by the service staff. Thus, the information to be used by the technical service staff will be displayed on the screen of the machine.

[0010] This allows the service staff to perform diagnosing at user's house without taking the machine to the service center. An embodiment wherein the washing machine will not heat the wash water can set an example. In this embodiment, the service staff starts a washing program and checks for any malfunction in electric wiring of the building by taking instant voltage into consideration. Then, the amount of water intake is displayed on the display screen and it is checked whether excess water is taken in or not. If such a problem exists, the staff may replace the pressure sensor or valve. If the water intake is at a normal level, instant water temperature indicates whether the resistance / the temperature sensor malfunctions or not, and the component is replaced in case of a malfunction. Thanks to the method, any malfunction of the machine can be diagnosed and fixed in a short time without taking the machine to the service center.

[0011] The method of the invention is intended for the technical staff not for the end user. The parameters displayed on the screen are not user-selected or user-evaluated values, but instantly measured (e.g. instant water temperature, instant rotational speed of the drum, instant water level, instant mains voltage and instant motor current) machine operating parameters. Therefore, the method assists the service staff that views these parameters in evaluating as to whether the machine functions properly or not.

**Claims**

1. A diagnostic method for washing machines **characterized in that** firstly the buttons on the control panel of the washing machine are activated by a combination known only by the service staff; then a washing program is started; and then machine operating parameters, measured instantly by the machine equipment, are displayed on the display screen. 5  
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2. A method according to Claim 1 wherein instant water temperature is shown on the display screen.
3. A method according to Claim 1 wherein instant rotational speed of the drum is shown on the display screen. 15
4. A method according to Claim 1 wherein instant water level is shown on the display screen. 20
5. A method according to Claim 1 wherein instant motor current is shown on the display screen.
6. A method according to Claim 1 wherein instant mains voltage is shown on the display screen. 25

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**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- CN 101429721 [0003]