



(11)

EP 3 296 440 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
21.03.2018 Bulletin 2018/12

(51) Int Cl.:
D06F 29/00 ^(2006.01) **D06F 39/00** ^(2006.01)
D06F 33/02 ^(2006.01)

(21) Application number: **16792008.1**

(86) International application number:
PCT/CN2016/079409

(22) Date of filing: **15.04.2016**

(87) International publication number:
WO 2016/180158 (17.11.2016 Gazette 2016/46)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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(30) Priority: **14.05.2015 CN 201510244206**

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(54) **WASHING MACHINE DISPLAY MODE**

(57) The disclosure discloses a display mode of a washing machine. The washing machine comprises at least two sets of washing devices and a display control panel, wherein the display control panel includes at least two different independent display interfaces, with one display interface corresponding to one set of washing device. The display control panel of the washing machine can display at least two colors, with one display interface corresponding to one color. After the washing machine is initialized, one set of the washing device or the combination of the at least two sets of washing devices are arbitrarily selected, and the display interfaces corresponding to different control processes of the selected washing device display different brightness. Through arranging at least two colors on the display screen of the washing machine, different control processes of the washing machine can be realized through the switching between different colors and different brightness, thereby satisfying the individual requirements of more users.

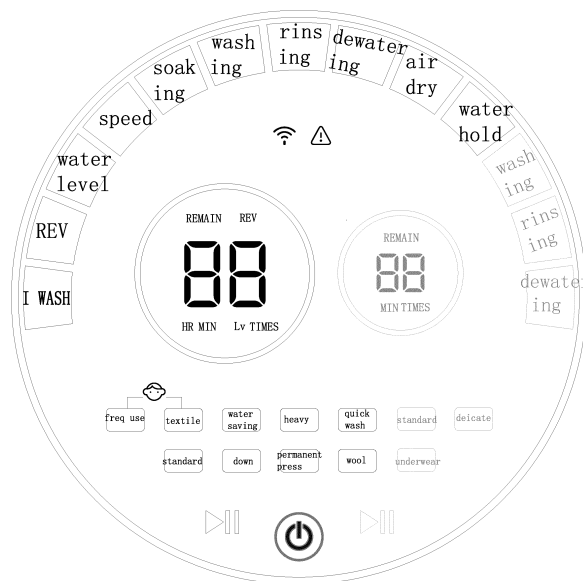


Fig. 1

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Description

Technical Field

[0001] The present disclosure relates to the technical field of a washing machine, and in particular to a display mode of a washing machine.

Background Art

[0002] With the improvement of people's material living standard, as a convenient and rapid laundry tool, the washing machine saves people a lot of time on doing laundry. Meanwhile, the aesthetic sense of people are also enhanced, the requirement on the washing machine is not limited to its functions only, people also propose a high requirement on the appearance of the washing machine and the visual effect brought about by the display screen. In addition, a higher requirement is proposed by consumers on operation convenience and operation distinguishing degree of the washing machine.

[0003] An ordinary washing machine is provided with a panel, while for a high-end washing machine, the panel is combined with a display screen or a display screen is singly arranged to replace the panel, and users can conveniently control the washing machine through the display screen and/or the panel. However, the display screen of the existing washing machine mainly adopts one display screen to control one washing bucket, and the display screen adopts a single color to display. In addition, the display effect is realized by switching between the two traditional states of brightness and extinguishment, and such a display mode is not enough to satisfy the individual consumption requirements of more users.

[0004] The Chinese patent with the application number of 20101000023.4 provides a method for controlling multiple degrees of brightness and extinguishment of the lamplight to indicate different washing states and a washing machine. The patent specifically discloses that different washing procedures and/or states are indicated by controlling the lamplight corresponding to each procedure to display at least three levels of brightness and extinguishment degrees, wherein different operation processes at least include: a process of displaying the startup screen, a process of selecting a washing procedure, a process of beginning to start the procedure, a process of procedure operating phase, a process of the completion of procedure operation, a process of standby of the procedure after operation, and a process in which users check the last washing procedure in the standby state. Although the present disclosure indicates different washing processes or states through multiple levels of brightness and extinguishment degrees, it does not disclose that the display screen of the washing machine includes at least two colors, wherein one color corresponds to the control and display interface of a set of washing device, and different control processes of the

washing machine are displayed to users through the animation switching mode between different colors and different brightness.

[0005] The Chinese patent with the application number of 201310173294.3 provides a double-drum washing machine with the underwear and outerwear being washed separately simultaneously, and discloses that the two washing buckets can flexibly select to work independently with a single bucket or work simultaneously with double buckets, and the two buckets are both provided with an independent detergent inlet and an independent state display liquid crystal display. Although the present disclosure discloses that multiple washing buckets are included, but each washing bucket is provided with an independent control and display screen, which is substantially different from the fact that one display screen controls multiple washing buckets provided by the present disclosure. Moreover, this disclosure does not disclose that different operating states can be indicated through various colors and various brightness.

[0006] In view of this, the present disclosure is specifically provided.

Summary of the Disclosure

[0007] The problem to be solved by the present disclosure is to overcome the shortcoming of the prior art, and provide a display mode of a washing machine. The display control panel is able to display various colors, and to display different degrees of brightness and extinguishment according to different operation processes. Thereby the problem that different operation states of multiple washing buckets are not easy to distinguish and are not rich with the display of only a single color is solved.

[0008] The present disclosure provides a washing machine, which includes at least two sets of washing devices, and a display control panel, wherein the display control panel includes at least two different independent display interfaces, with each one display interface corresponding to one set of washing device.

[0009] Preferably, different independent display interfaces are the combination of one or more than two of different animation display, different shape identification display, different color display and different brightness display.

[0010] Preferably, the display control panel includes an external luminous circle and at least two internal luminous circles. The content displayed by the internal luminous circles is the remaining time or appointment time; one internal luminous circle corresponds to the time display of a washing device, and the external luminous circle and the internal luminous circles include at least two different colors.

[0011] Preferably, the display control panel includes at least two layers of films with different transmittances or one of the at least two indicator lamps displaying different colors or the combination thereof.

[0012] Preferably, the washing machine includes two

sets of washing devices, which are operated independently, the display control panel is provided with two control and display areas of two sets of washing devices in a one-to-one correspondence manner, and the two control and display areas correspond to the display of different colors.

[0013] The present disclosure further provides a display mode of a washing machine, the display control panel of the washing machine can display at least two colors, with one display interface corresponding to one color. After the washing machine is initialized, one set of washing device or the combination of at least two sets of washing devices are arbitrarily selected, and the display interface corresponding to different control processes of the selected washing device displays different brightness.

[0014] Preferably, when the washing machine is initialized, the display interface is displayed by the switching of various colors based on a predetermined display path.

[0015] Preferably, the switching process displays different brightness.

[0016] Preferably, the control process includes a process for selecting the washing procedure and a process for customizing the washing parameters. In the process for selecting the washing procedure, the lamplight of an icon of the selected washing procedure and the lamplight of the icons corresponding to the washing parameters of the washing procedure in the display interface are on; and in the process for customizing the washing parameters, the lamplight of the icons corresponding to the selected washing parameters in the display interface is on.

[0017] Preferably, the control process further includes a procedure operating phase. In the procedure operating phase, the lamplight of the icons corresponding to the parameters of the currently operating procedure in the display interface is on, the lamplight corresponding to the icons of other unfinished washing parameters is semi-bright, and the lamplight of the icons corresponding to the finished washing parameters is extinguished.

[0018] Preferably, the control process further includes a procedure pause phase, when the procedure is paused, the lamplight of the icons corresponding to the parameters of the currently operating procedure in the display interface is on, and the lamplight corresponding to the icons of the non-operating washing parameters is semi-bright.

[0019] Preferably, the control process further includes a phase of the completion of procedure operation, when the procedure operation is completed; the lamplight in the display interface is extinguished.

[0020] Preferably, the brightness further comprises flashing, when the off-line time of users is greater than a predetermined time; the lamplight of the icons corresponding to the parameters of the currently operating procedure becomes flashing from bright.

[0021] The solution of the present disclosure brings about the following beneficial effects:

(1) The display control panel can be switched be-

tween various colors to satisfy individual product requirements;

(2) The display control panel includes various different and independent display interfaces, with one display interface independently controlling the operation of one washing bucket; therefore, the display effects can express different operation states through various different degrees of brightness.

(3) The diversity of the display contents of the display control panel can be realized through the indicator lamps of different display colors or multiple layers of films with different transmittances; and

(4) The display control panel is united with the upper cover of a washing machine and more space is saved.

Brief Description of Drawings

[0022]

Fig. 1 is a display effect diagram showing that the display control panel includes two display interfaces in an embodiment of the present disclosure;

Fig. 2 is a display effect diagram of part of the content of the display control panel during initialization in an embodiment of the present disclosure;

Fig. 3 is a display effect diagram of two internal luminous circles of the display control panel during initialization in an embodiment of the present disclosure;

Fig. 4 is a display effect diagram of the display interface corresponding to the selected washing procedure in an embodiment of the present disclosure;

Fig. 5 is a display effect diagram of starting the display interface corresponding to the selected washing procedure in an embodiment of the present disclosure;

Fig. 6 is a display effect diagram of the display interface corresponding to the customized washing parameters in an embodiment of the present disclosure;

Fig. 7 is a display effect diagram of starting the display interface corresponding to the customized washing parameters in an embodiment of the present disclosure;

Fig. 8 is a display effect diagram of the starting of two display interfaces in an embodiment of the present disclosure;

Fig. 9 is a display effect diagram in the paused state in an embodiment of the present disclosure;

Fig. 10 is a display effect diagram showing that one of the washing buckets finishes operation in the embodiment of the present disclosure.

Detailed Description of the Embodiments

[0023] The present disclosure will be further described below in combination with the accompanying drawings and specific embodiments of the present disclosure.

[0024] In order to satisfy the individual requirements of users on the display screen of the washing machine and improve the distinguishing degree of controlling the operation of multiple washing buckets by a single display screen, the present disclosure provides a display mode of a washing machine. Through the arrangement of at least two colors on the display screen of the washing machine, with one color being corresponding to the control display interface of one set of washing device, different control processes of the washing machine is realized through the switching between different colors and different brightness, and through various colors, the process of each operating state of each washing bucket can be distinguished more easily, and the individual requirements of more users can be satisfied.

[0025] The washing machine in the present disclosure includes at least two sets of washing devices and a display control panel, wherein the display control panel includes at least two different independent display interfaces, with one display interface corresponding to one set of washing device. In addition, different independent display interfaces are the combination of one or more than two of different animation display, different shape identification display, different color display and different brightness display. The display control panel includes an external luminous circle and at least two internal luminous circles, the content displayed by the internal luminous circles is the remaining time or appointment time; one internal luminous circle corresponds to the time display of a washing device, and the external luminous circle and the internal luminous circles include at least two different colors. The display control panel includes at least two layers of films with different transmittances or one of the at least two indicator lamps displaying different colors or the combination thereof.

[0026] The display control panel can display at least two colors, with one display interface corresponding to one color. The washing machine includes two sets of washing devices, which are operated independently, the display control panel is provided with two control and display areas of two sets of washing devices in a one-to-one correspondence manner, and the two control and display areas correspond to the display of different colors. As shown in Fig. 1, the color displayed in the first display interface which is the part with a dark color on the left side of the picture is blue, , and the first display

interface controls the operation of the first washing bucket (also called as the first washing device). The color displayed in the second display interface, which is the part with a light color on the right side of the picture, is yellow, and the second display interface controls the operation of the second washing bucket (also called as the second washing device). The first display interface and the second display interface separately control the operation process of the corresponding washing bucket, and the first washing bucket and the second washing bucket can operate independently, synchronously and asynchronously.

[0027] After the washing machine in the present disclosure is electrified, and when the washing machine is initialized, the display interface is firstly displayed by two colors in a switching manner based on the predetermined display path, and the animation process displayed by two colors is presented (please refer to Fig. 2 and Fig. 3). When the power switch of the washing machine is triggered, the color displayed in the first display interface is blue, the color displayed in the second display interface is yellow. The indicator lamps of the icons of part of the buttons in the first display interface (namely, the washing parameters on the left side in Fig. 2) are lighted in sequence, the indicator lamps of the external luminous circle are on with blue color, the displayed brightness corresponding to the entirety is bright. Then the indicator lamps of the icons of part of the second display interface (namely, the washing parameters on the right side in Fig. 2) are lighted in sequence, the color of the indicator lamps in the external luminous circle becomes yellow, the displayed brightness corresponding to the entirety is bright. After an interval of 0.5 second, the displayed brightness of the indicator lamps in the first internal luminous circle of the first display interface and in the second internal luminous circle of the second display interface is semi-bright, "--" is displayed in all the luminous circles, the displayed brightness is all semi-bright, the brightness of the icons of buttons of the washing procedure in the lower part and the brightness of the icons of the two start/pause buttons are all displayed as semi-bright, the indicator lamps in the external luminous circle are semi-bright and blue, the luminous circles of the two buckets are semi-bright, the indicator lamps of the icons of the remaining buttons are extinguished, as shown in Fig. 3.

[0028] Fig. 4 shows the display picture of the starting process when the "frequently-used" procedure in the washing procedure in the first display interface is selected, after the icon of the "frequently-used" procedure is selected, the color displayed by the external luminous circle and the first display interface is blue, and the color displayed by the first internal luminous circle and the icons corresponding to each procedure in the washing procedures is blue. The indicator lamp of the procedure is bright, the indicator lamps of the washing parameters corresponding to the procedure are bright, and the indicator lamps of the other remaining washing parameters are semi-bright. While the color displayed by the second

internal luminous circle in the second display interface and the icons corresponding to each procedure in the washing procedures is yellow, the displayed brightness is semi-bright, and all the washing parameters in the second display interface are not displayed. The icons corresponding to the "start/pause" buttons in the first display interface are selected, as shown in Fig. 5, when the "start" button is triggered, the laundry process starts from "soaking" firstly, the displayed brightness of the indicator lamps corresponding to the currently operating washing parameters is bright, the displayed brightness of the to-be-operated washing parameters is semi-bright, the remaining washing parameters which are not operated are not displayed, namely, the corresponding displayed brightness is extinguished. After an interval of 20 seconds, the indicator lamps corresponding to the currently operating washing parameters become flashing, the remaining to-be-operated washing parameters are semi-bright, the first internal luminous circle and the remaining time in the luminous circle are flashing, the color displayed by the second display interface is yellow, the corresponding second internal luminous circle and the "--" displayed in the luminous circle and the icons corresponding to the washing procedure are all semi-bright, all the other indicator lamps are not displayed. When a certain washing parameter is completed, the corresponding indicator lamp is extinguished automatically, the washing parameters which are operated continuously serve as the current washing parameters, the displayed brightness becomes flashing, the to-be-operated washing parameters are semi-bright, and the remaining can be done in the same manner.

[0029] In addition, users can also customize and select to set washing parameters according to their own requirements to wash clothes, please refer to Fig. 6 and Fig. 7 which show the changing condition of the display interfaces in the process of selecting the customized washing parameters. After the icons of the "washing" parameters in the first display interface are selected, the color displayed in the first display interface is blue, and the displayed brightness of the display icons of at least three washing parameters including "washing", "rinsing" and "dewatering" is bright. The indicator lamp of the "washing" parameter is firstly twinkled, when the icon is clicked once, the corresponding appointment time in the first luminous circle is increased by one minute, and the initial appointment time is 30 minutes, and the appointment time is increased on this basis. When the "rinsing" parameter is clicked, the indicator lamp of the icon corresponding to the "rinsing" parameter is twinkled, and the icons of the "washing" parameter which has already been well set are no longer twinkled, and the displayed brightness is bright. And the adjustment process is similar to that of adjusting the "washing" parameter, after the "rinsing" parameter is determined, the icons corresponding to the "start/pause" buttons in the first display interface are selected. When the "start" button is triggered, firstly, the laundry process begins from "soaking", namely, the

displayed brightness of the icon corresponding to the currently operating "soaking" parameter is bright, the displayed brightness of the icons corresponding to the to-be-operated "washing", "rinsing" and "dewatering" parameters is semi-bright, and the remaining washing parameters are not displayed, namely, the displayed brightness of the icons corresponding to the remaining washing parameters is extinguished. After an interval of 20 seconds, the indicator lamp corresponding to the "soaking" parameter becomes flashing, the first internal luminous circle and the remaining time in the luminous circle are also flashing; the color displayed in the second display interface is yellow. The corresponding second internal luminous circle, the "--" displayed in the luminous circle and the icons corresponding to the washing procedure are all semi-bright, and the others are not displayed.

[0030] Specifically, when the first and second display interfaces in the display control panel are both selected, one of the display interfaces is firstly selected for selecting the washing procedures or customizing the washing parameters, after the washing machine is started, corresponding selection operation is conducted on another display interface, and then the washing machine is started again. For the process of starting the two interfaces, please refer to the process of starting the first display interface described above, which will not be repeated herein. Fig. 8 shows the display effect when "frequently-used" washing procedures are all started in both two display interfaces, the external luminous circle is blue and semi-bright, the indicator lamps of the icons of "frequently-used" procedures, the icons of the corresponding washing parameters, the first internal luminous circle and the remaining time in the luminous circle in the first display interface are all blue. Wherein the currently operating washing parameters, the first internal luminous circle and the remaining time in the luminous circle are all flashing, the to-be-operated washing parameters are semi-bright, and the remaining non-operated washing parameters are not displayed. The indicator lamps of the icons of "frequently-used" procedures, the icons of the corresponding washing parameters, the second internal luminous circle and the remaining time in the luminous circle in the second display interface are all yellow, wherein the currently operating washing parameters, the second internal luminous circle and the remaining time in the luminous circle are all flashing, the to-be-operated washing parameters are semi-bright, and the remaining non-operated washing parameters are not displayed

[0031] Specifically, when the "start/pause" buttons are triggered again, the washing machine is deemed to be in a paused state, and the display effect is as shown in Fig. 9. Wherein the external luminous circle and the indicator lamps of the first display interface are blue, the indicator lamps in the second display interface are yellow. The displayed brightness of the first internal luminous circle and the remaining time in the luminous circle, the second internal luminous circle and the remaining time in the luminous circle, and the icons of the currently op-

erating washing parameters and the currently operating washing procedures in the two display interfaces is all bright, the icons of the remaining to-be-operated washing parameters and the icons of the start/pause" buttons are semi-bright, and the other washing procedures which are not selected are semi-bright. When the "start/pause" buttons are triggered still again, and a start state is recovered from the paused state, the corresponding display interface also recovers to the started interface, which has been summarized above and will not be repeated herein.

[0032] After one of the washing buckets completes washing, as shown in Fig. 10 that after the first washing bucket completes washing, the first internal luminous circle, the time "00" inside the luminous circle and the icon of the washing procedure in the first display interface are all blue and semi-bright, with the washing parameters being not displayed; and the second internal luminous circle, the remaining time in the luminous circle and the icons of the currently operating washing procedure and the icons of the currently operating washing parameters in the second display interface are all yellow and the displayed brightness is flashing. The icons of the to-be-operated washing parameters and the "start/pause" buttons are semi-bright, with other washing parameters and washing procedures being not displayed. After the washing in another washing bucket is completed, the electricity is automatically cut off, and the two display interfaces are both extinguished.

[0033] The implementation schemes in the above embodiments can be further combined or replaced, and the embodiments are merely the description of the preferred embodiments of the present disclosure, rather than limiting the concept and scope of the present disclosure. Under the premise of not departing from the design concept of the present disclosure, any modifications and improvements made by those of ordinary skill in the art to the technical solutions of the present disclosure shall all fall within the protection scope of the present disclosure.

Claims

1. A washing machine, comprising at least two sets of washing devices and a display control panel, wherein the display control panel comprises at least two different independent display interfaces, with one display interface corresponding to one set of washing device.
2. The washing machine according to claim 1, wherein each of the independent display interfaces is one or combination of more than two displays selected from a group containing different animation display, different shape identification display, different color display and different brightness display.
3. The washing machine according to claim 1, wherein the display control panel comprises an external luminous circle and at least two internal luminous circles, content displayed by the internal luminous circles is a remaining time or an appointment time; one internal luminous circle corresponds to time display of one washing device, and the external luminous circle and the internal luminous circle comprise at least two different colors.
4. The washing machine according to claim 3, wherein the display control panel comprises at least two layers of films with different transmittances or at least two indicator lamps displaying different colors, or a combination thereof.
5. The washing machine according to claim 3 or 4, wherein the washing machine comprises two sets of washing devices which are operated independently, the display control panel is provided with two control and display areas corresponding to the two sets of washing devices in a one-to-one manner, and the two control and display areas display different colors.
6. A display mode of the washing machine according to any one of claims 1-5, wherein the display control panel of the washing machine displays at least two colors, with one display interface corresponding to one color, after the washing machine is initialized, one set of washing device or a combination of at least two sets of washing devices are arbitrarily selected, and display interfaces corresponding to different control processes of the washing device selected display different brightness from each other.
7. The display mode of the washing machine according to claim 6, wherein when the washing machine is initialized, and the display interfaces are displayed by switching colors based on a predetermined display path; preferably, the switching process displays different brightness.
8. The display mode of the washing machine according to claim 6, wherein the control process comprises a process for selecting a washing procedure and a process for customizing washing parameters, in the process for selecting the washing procedure, a lamplight of an icon of a selected washing procedure and the lamplight of the icons corresponding to the washing parameters of the washing procedure in the display interface are bright; and in the process for customizing the washing parameters, the lamplight of the icons corresponding to the washing parameters selected in the display interface is bright.
9. The display mode of the washing machine according

to any one of claims 6-8, wherein the control process further comprises a procedure operating phase, in the procedure operating phase, the lamplight of the icons corresponding to parameters of the operating procedure in the display interface is bright, a lamplight corresponding to the icons of the washing parameters of another non-operating procedure is semi-bright, and a lamplight of the icons corresponding to the washing parameters of completed operating procedure is extinguished. 5 10

10. The display mode of the washing machine according to any one of claims 6-8, wherein the control process further comprises a procedure pause phase, when the procedure is paused, a lamplight of the icons corresponding to parameters of the currently operating procedure in the display interface is bright, and a lamplight corresponding to the icons of washing parameters of non-operating procedure is semi-bright. 15 20

11. The display mode of the washing machine according to claim 9, wherein the control process further comprises a procedure pause phase, when the procedure is paused, the lamplight of the icons corresponding to the parameters of the currently operating procedure in the display interface is bright, and the lamplight corresponding to the icons of washing parameters of non-operating procedure is semi-bright. 25 30

12. The display mode of the washing machine according to any one of claims 6-8, wherein the control process further comprises a phase of a completion of procedure operation, when the procedure operation is completed, the lamplight in the display interface is extinguished. 35

13. The display mode of the washing machine according to claim 9, wherein the control process further comprises a phase of a completion of procedure operation, when the procedure operation is completed, the lamplight in the display interface is extinguished. 40

14. The display mode of the washing machine according to claim 10, wherein the control process further comprises a phase of a completion of procedure operation, when the procedure operation is completed, the lamplight in the display interface is extinguished. 45 50

15. The display mode of the washing machine according to claim 11, wherein the control process further comprises a phase of a completion of procedure operation, when the procedure operation is completed, the lamplight in the display interface is extinguished. 55

16. The display mode of the washing machine according to claim 6, wherein the brightness further comprises

flashing, when an off-line time of users is greater than a predetermined time, the lamplight of the icons corresponding to the parameters of the currently operating procedure becomes flashing from bright.

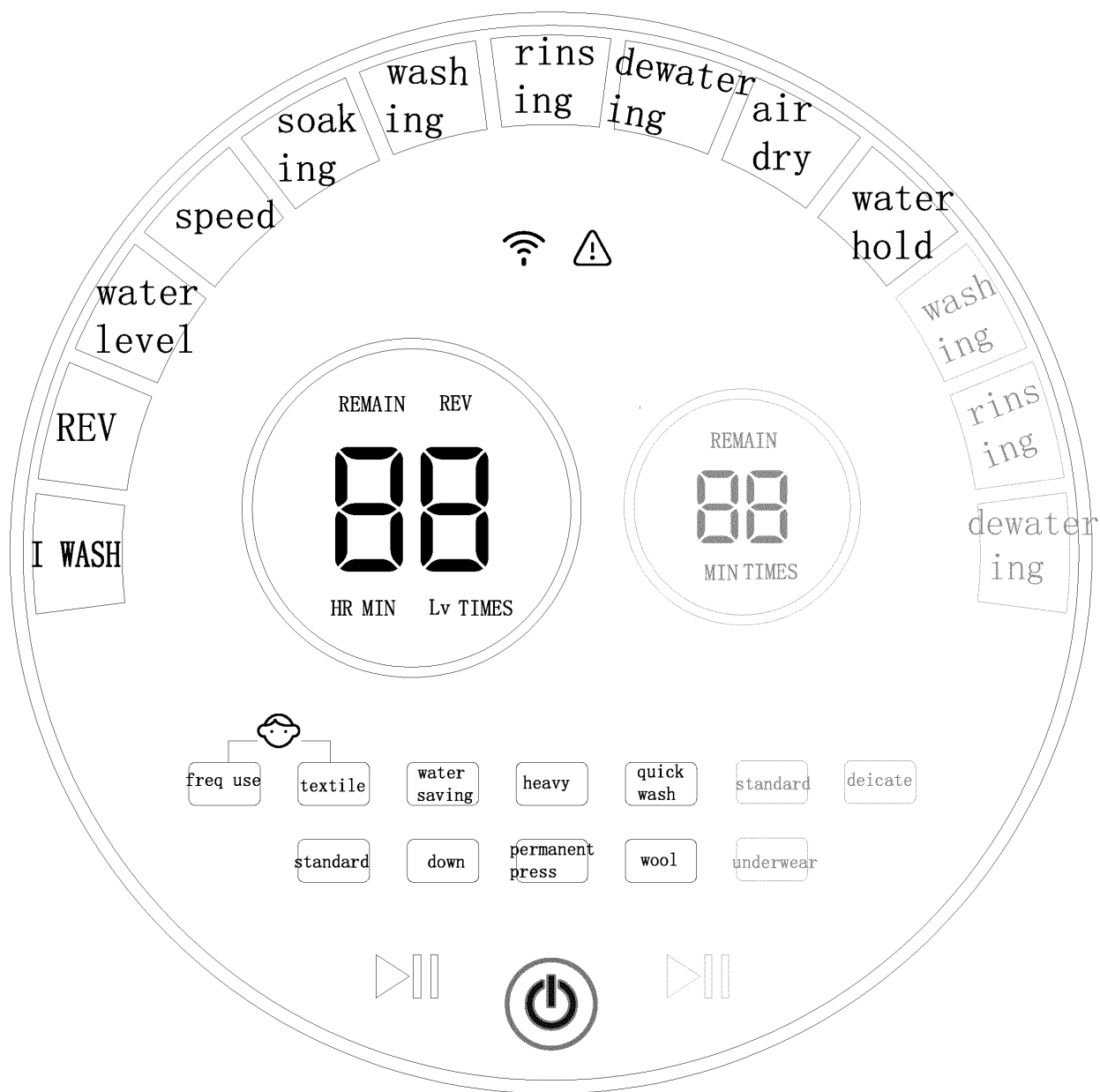


Fig. 1

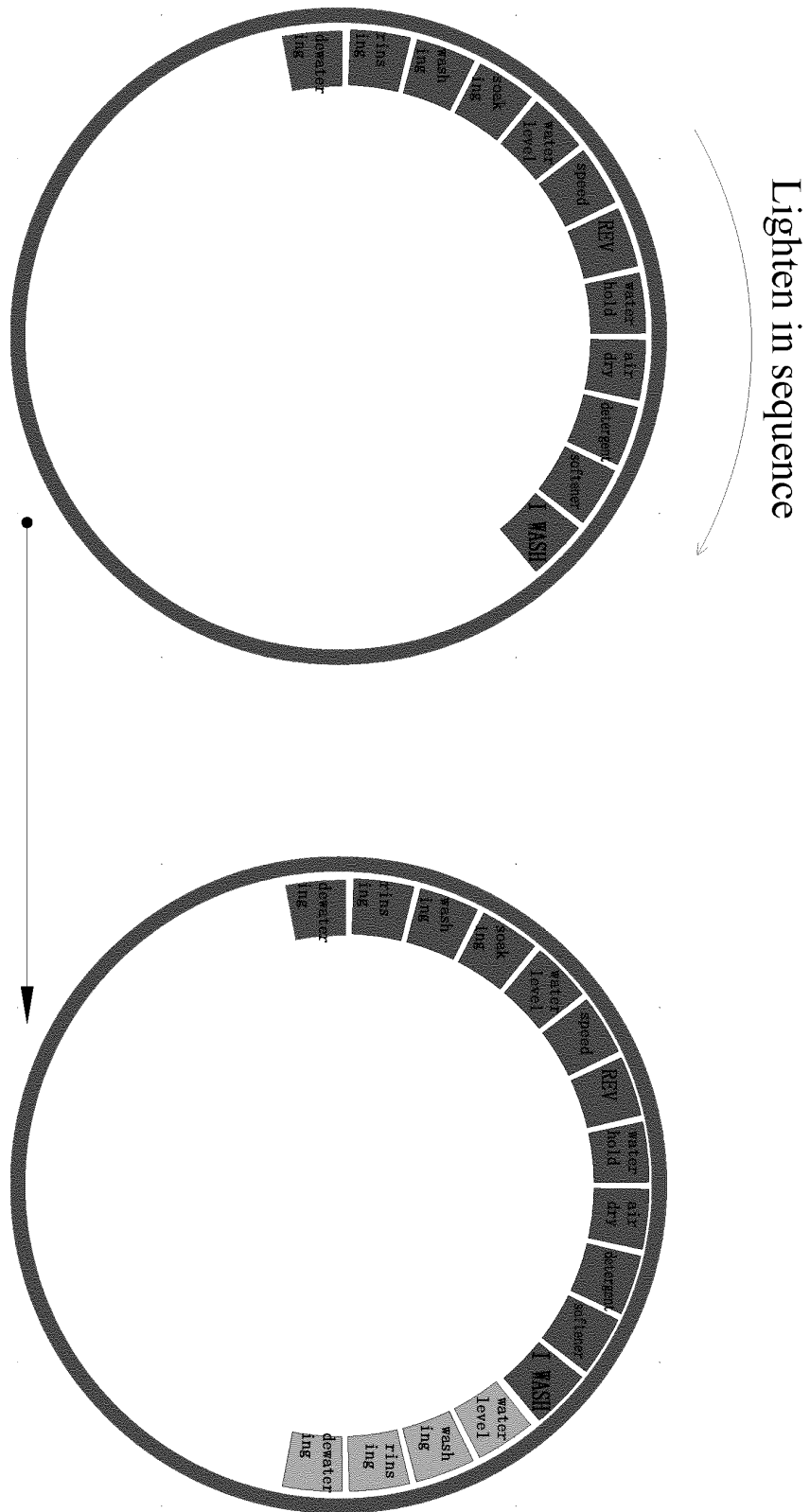


Fig. 2

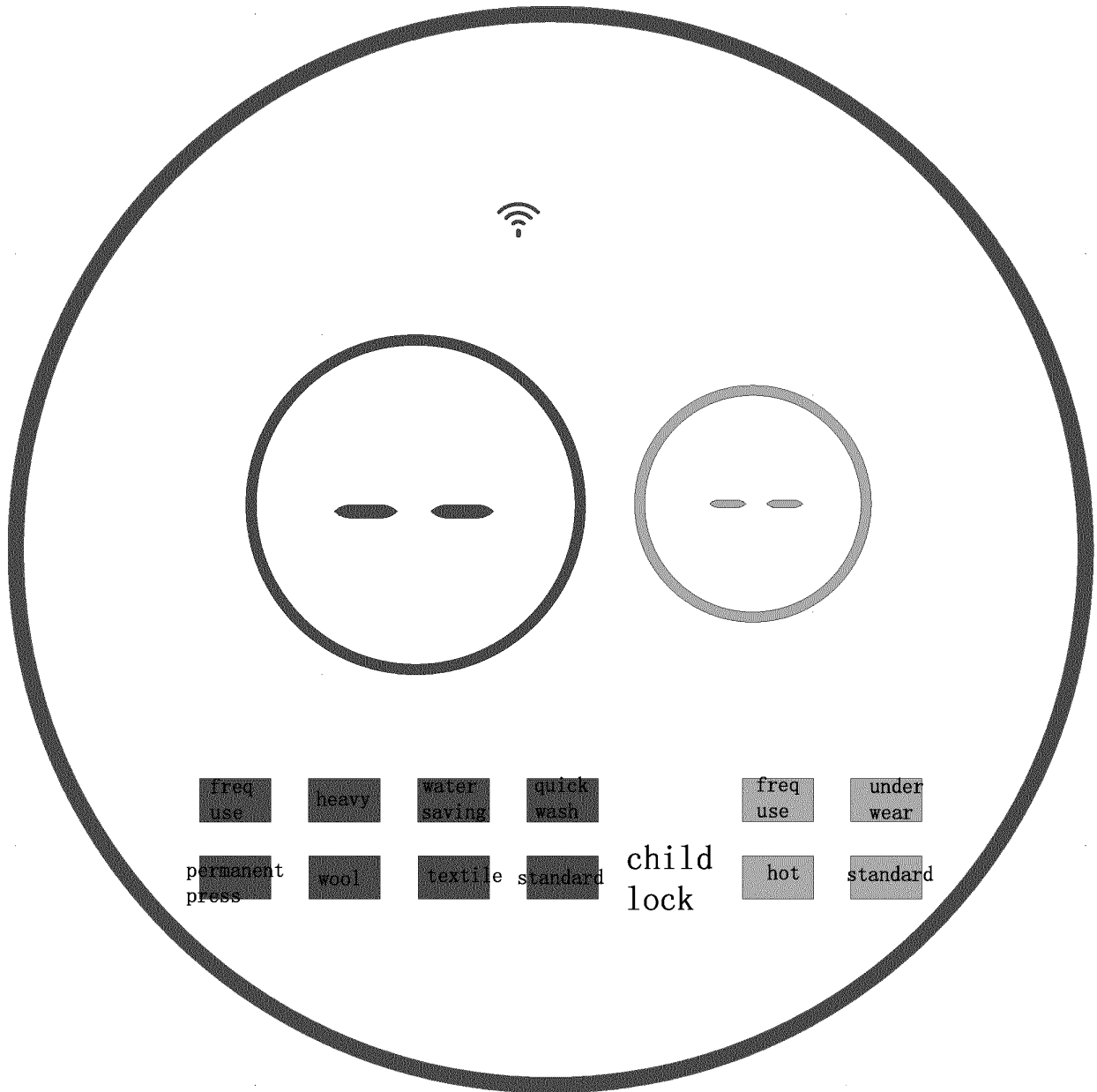


Fig. 3

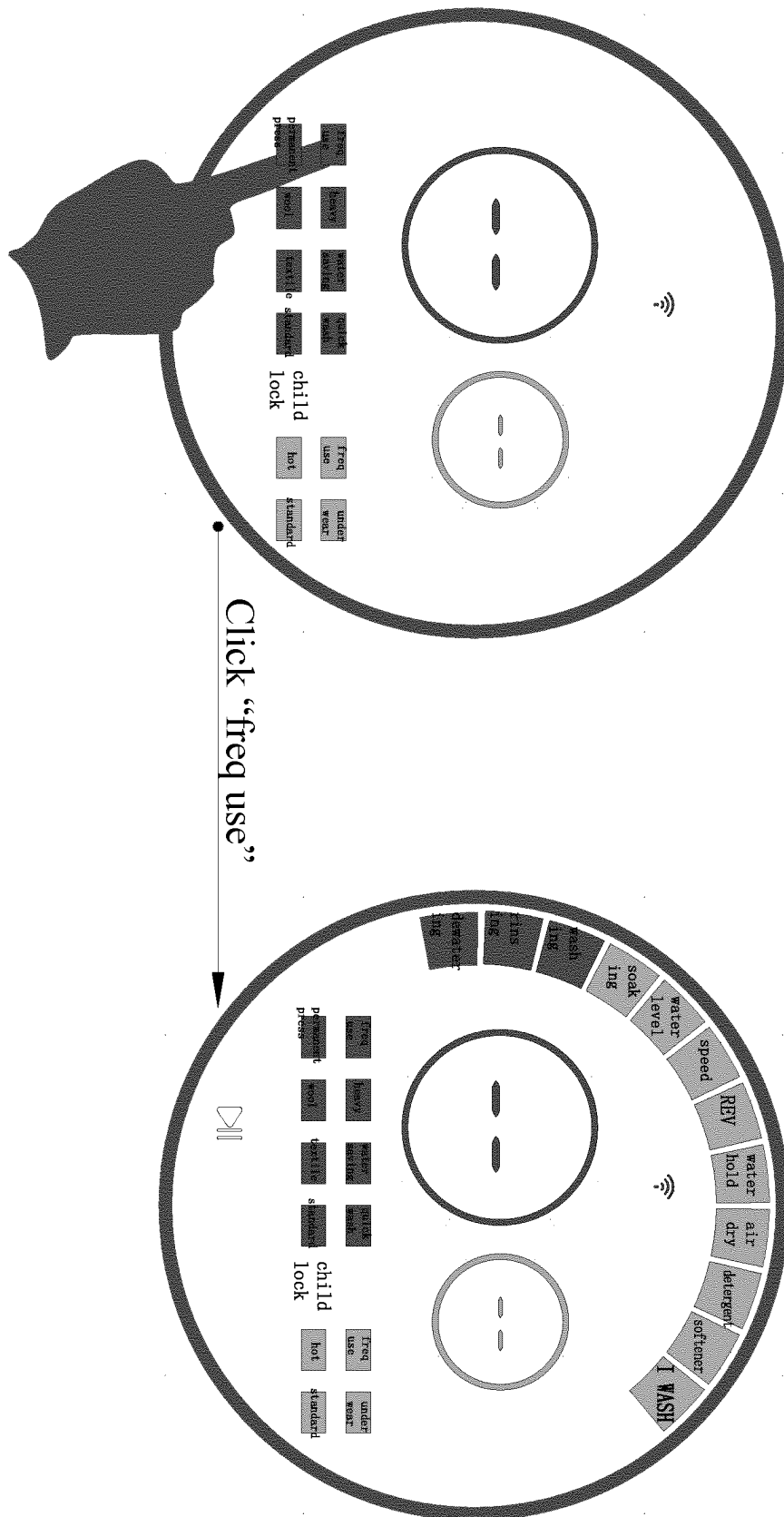


Fig. 4

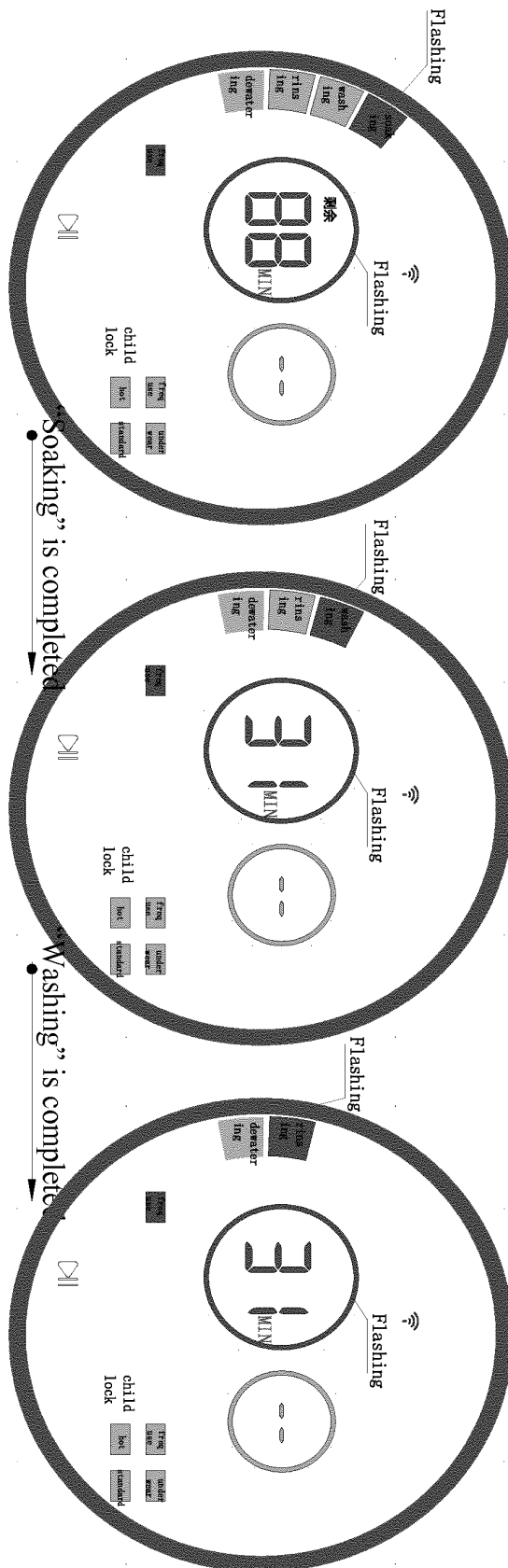


Fig. 5

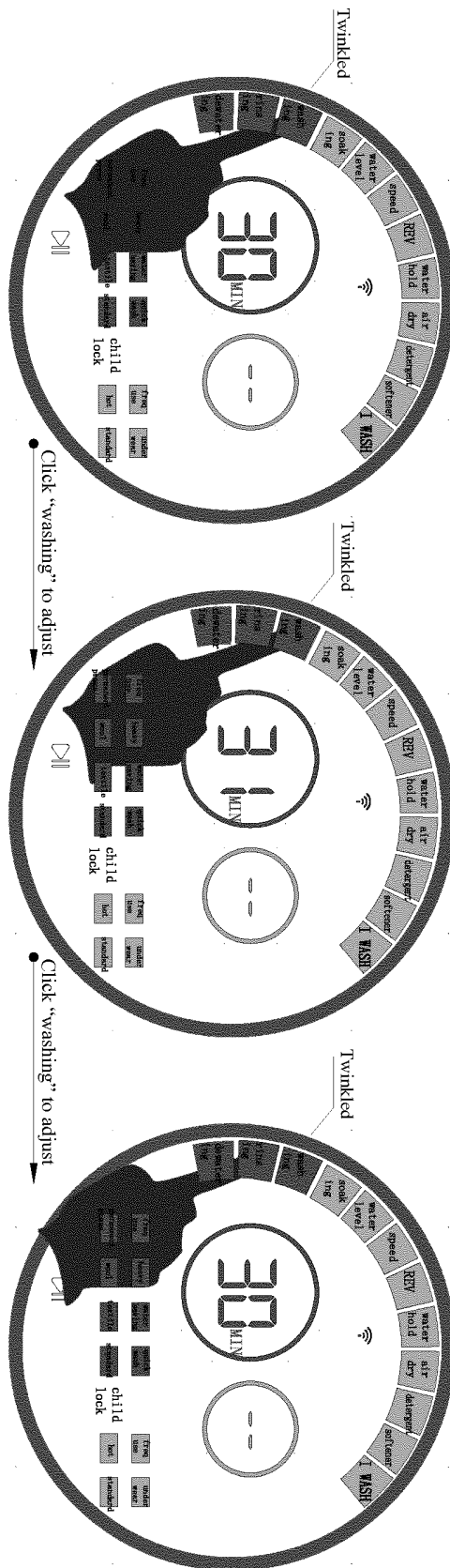


Fig. 6

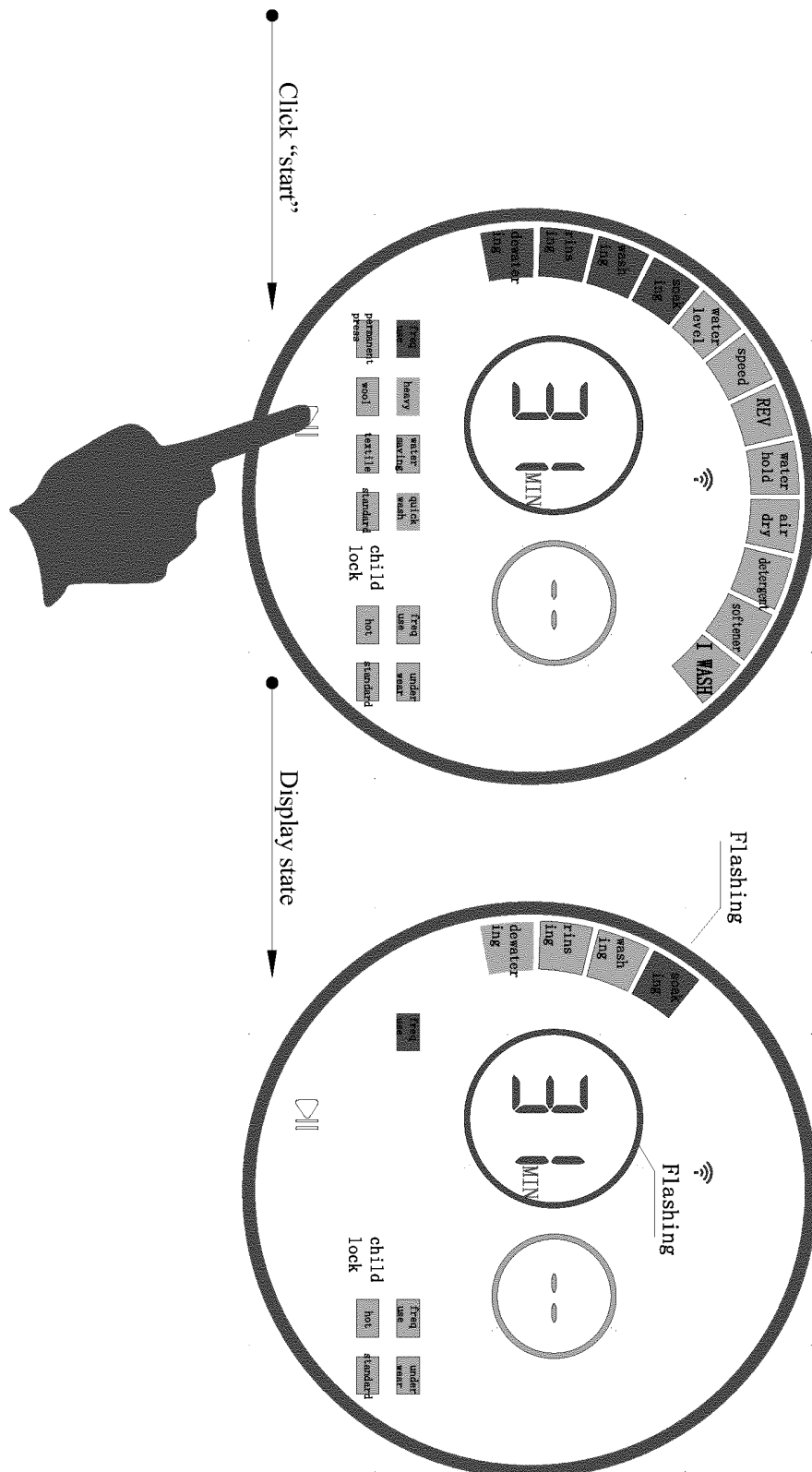


Fig. 7

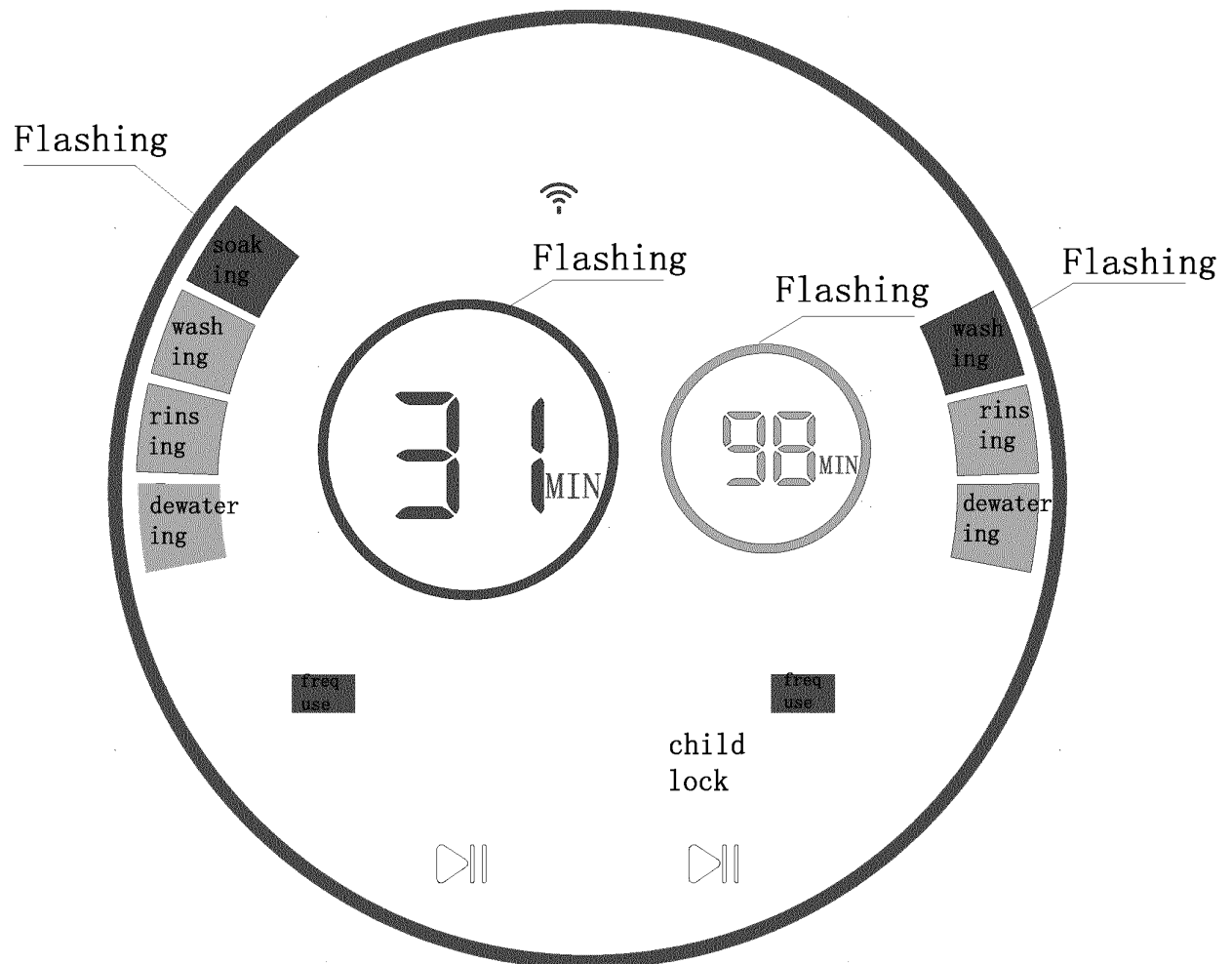


Fig. 8

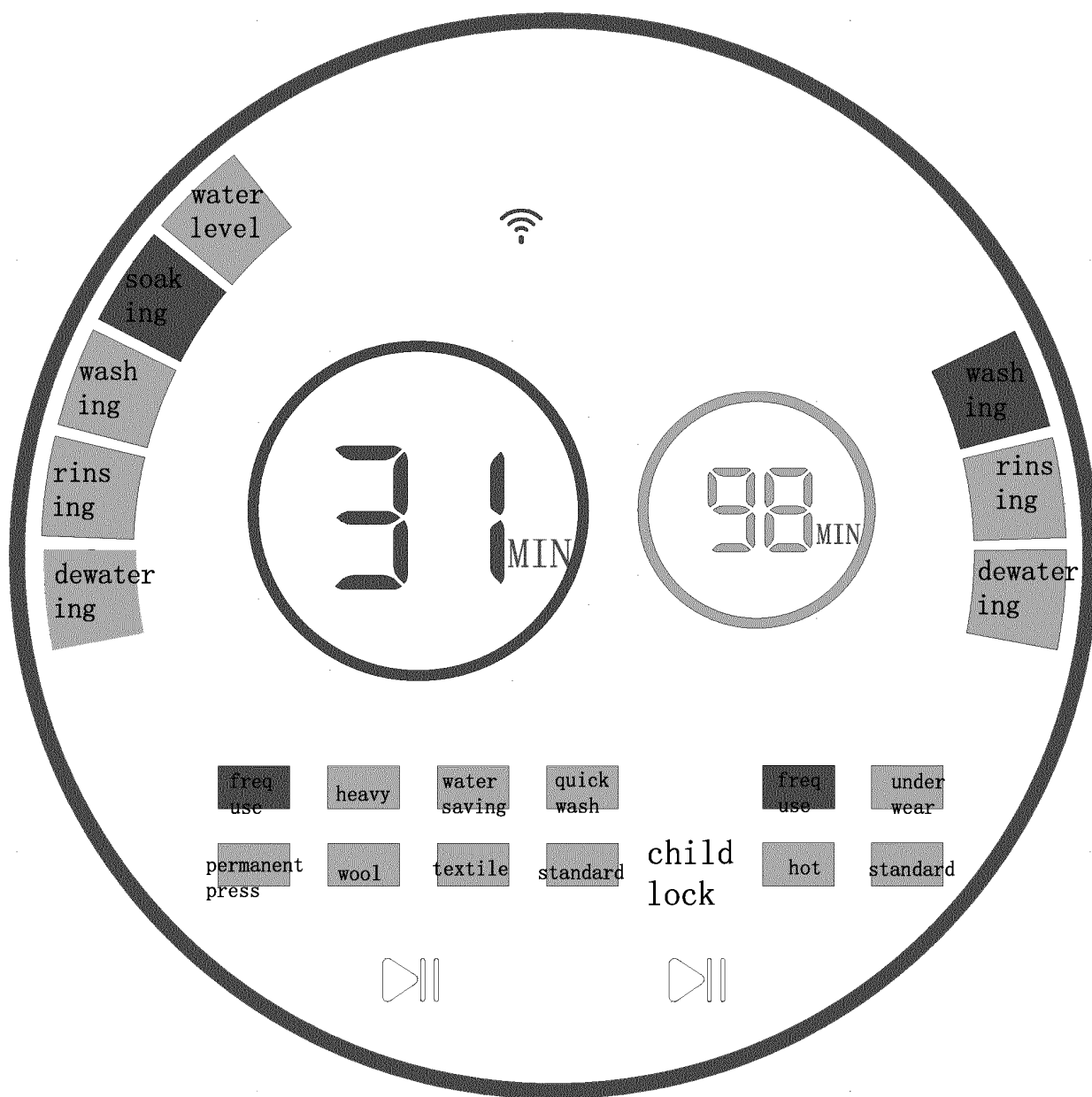


Fig. 9

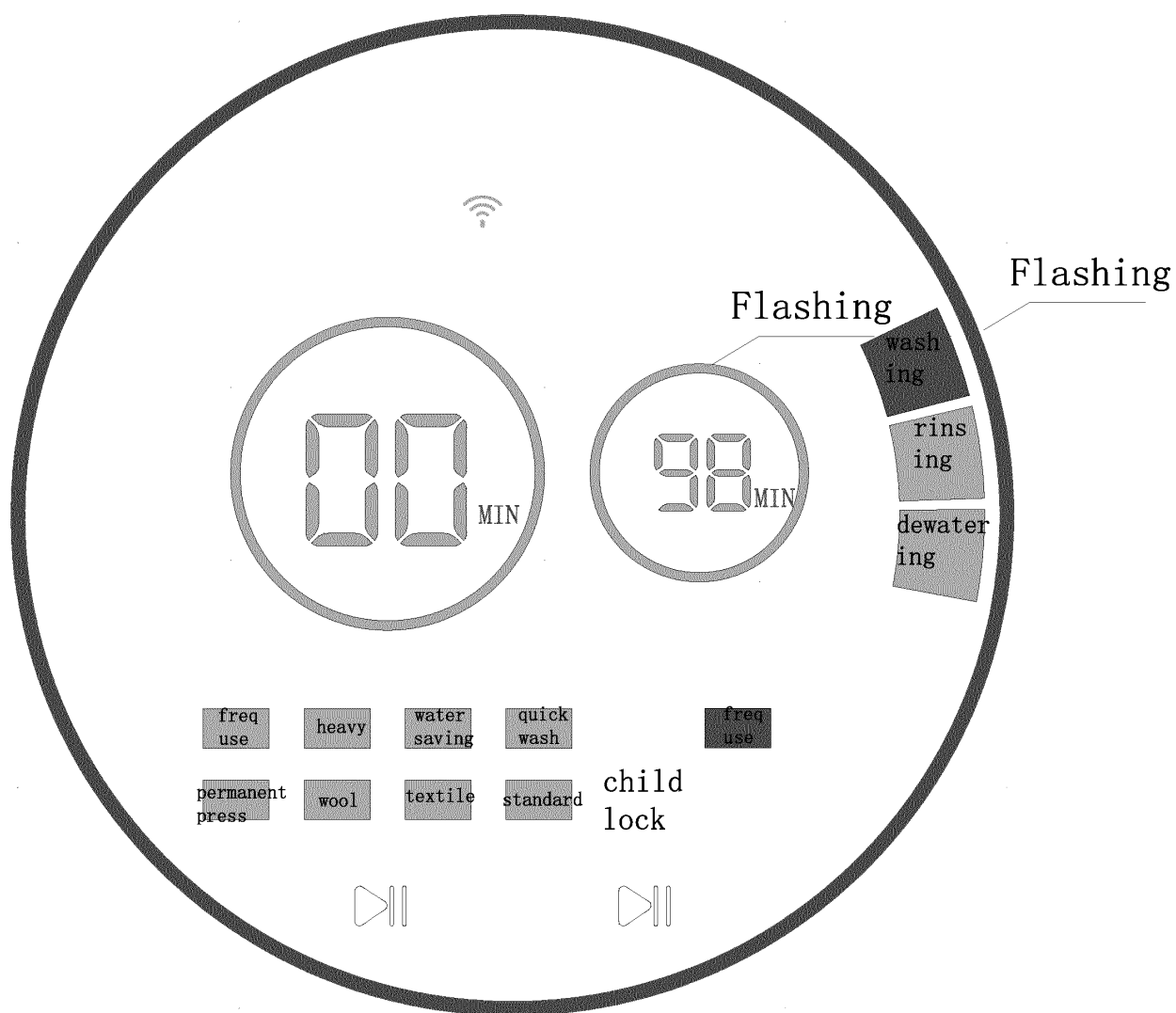


Fig. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2016/079409

A. CLASSIFICATION OF SUBJECT MATTER

D06F 29/00 (2006.01) i; D06F 39/00 (2006.01) i; D06F 33/02 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS; SIPOABS; DWPI: screen, indicat+, led, display+, color, colour, lcd, show+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 03158187 A (HITACHI LTD.) 08 July 1991 (08.07.1991) see description, page 2, column 2 and figures 1 to 3	1
Y	JP 03158187 A (HITACHI LTD.) 08 July 1991 (08.07.1991) see description, page 2, column 2 and figures 1 to 3	2-16
X	JP 0751180 B2 (HITACHI LTD.) 05 June 1995 (05.06.1995) see figures 1 to 3	1
Y	JP 0751180 B2 (HITACHI LTD.) 05 June 1995 (05.06.1995) see figures 1 to 3	2-16
X	US 4510778 A (MAYTAG CO.) 16 April 1985 (16.04.1985) see description, column 3, line 11 to 16 and figures 1 and 2	1
Y	US 4510778 A (MAYTAG CO.) 16 April 1985 (16.04.1985) see description, column 3, line 11 to 16 and figures 1 and 2	2-16

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search

14 June 2016

Date of mailing of the international search report

21 July 2016

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2016/079409

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	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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