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(54) **FULLY AUTOMATIC WASHING MACHINE**

(57) Disclosed is a fully automatic washing machine, including a housing (1), a control disk seat (2) and an upper cover plate (3). The control disk seat (2) is located on a top of the housing (1). A clothes throwing inlet (7) is formed in the control disk seat (2). The upper cover plate (3) is rotatably arranged on the control disk seat (2) so as to open or close the clothes throwing inlet (7), wherein an integrated display and control knob (4) is arranged on an upper portion of a front side surface of the washing machine; and an entire upper top surface of the washing machine is formed in a closed state of the upper cover plate (3). The integrated display and control knob (4) replaces an existing knob and a control mode of a display screen is used, so that an entire operation panel is replaced. The washing machine has a simple appearance, and is arranged on the front side surface of the machine body without occupying an upper surface of the control disk seat (2). The upper cover plate (3) of the throwing inlet for throwing clothes forms the entire upper top surface of the washing machine. The washing machine has a larger clothes throwing port (7). A corresponding procedure of the integrated display and control knob (4) and display contents can be modified through a background controller, so that hardware has strong compatibility; and a use habit of consumers is not

changed, so that use is convenient.

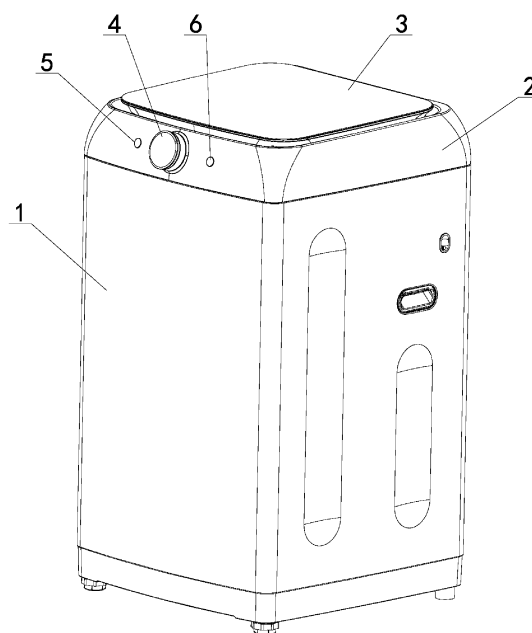


FIG. 1

Description

TECHNICAL FIELD

[0001] The present invention relates to a fully automatic washing machine.

BACKGROUND

[0002] At present, with the development of industry of electrical home appliances, to simultaneously satisfy needs of various users, required functions of the fully automatic washing machine are more and more diversified. For example, for different clothes materials, various specific washing procedures need to be set. For the users, on one hand, to obtain good user experience, operation is required to be direct and simple as much as possible; and on the other hand, appearances of the electrical home appliances are required to be more simple and beautiful. Complication of the functions of the electrical home appliances involves more man-machine interaction. A more advanced form is to directly adopt a touch screen to fully complete display, selection and confirmation, but the cost of the form is high and the form can only be used for some high-end machine types.

[0003] A control form generally adopted currently in the industry is to arrange an individual display portion and an operation portion on a control panel. A most commonly used form is a control form that combines a display screen with a knob. The knob can directly mark a corresponding procedure, such as "common, cotton and linen, chemical fiber and the like". A corresponding washing procedure can be conveniently selected by rotating the knob to a corresponding position. The corresponding display screen can also be replaced with a printing interface + LED lamp + LED display or printing interface + LCD/LED module, and is configured to complete display in a control procedure and display of operation state information. The control form is visual in operation, but is not beautiful in entire appearance. For the fully automatic washing machine, a space on an upper surface of a control disk seat needs to be occupied during installation to facilitate operation. The entire machine is complex in assembly, and has a defect of being difficult to regulate the procedure later.

SUMMARY

[0004] A purpose of the present invention is to provide a fully automatic washing machine which adopts an integrated display and control knob to replace an existing knob and a control mode of a display screen; and an upper cover plate of a throwing inlet for throwing clothes forms an entire upper top surface of the washing machine.

[0005] A fully automatic washing machine includes a housing, a control disk seat and an upper cover plate. The control disk seat is located on a top of the housing.

A clothes throwing inlet is formed in the control disk seat. The upper cover plate is rotatably arranged on the control disk seat so as to open or close the clothes throwing inlet. An integrated display and control knob is arranged on an upper portion of a front side surface of the washing machine. An entire upper top surface of the washing machine is formed in a closed state of the upper cover plate.

[0006] Further, the integrated display and control knob is located in a range above 4/5 of an entire height of the washing machine.

[0007] Further, a power button and a start-stop button are symmetrically arranged on both sides of an installation position of the integrated display and control knob respectively, or the power button and the start-stop button are arranged on one side of the installation position of the integrated display and control knob.

[0008] Preferably, the integrated display and control knob is installed on a front side surface of the housing or a front side surface of the control disk seat.

[0009] Further, the front side surface of the housing or the front side surface of the control disk seat is inclined towards a rear side of an entire machine body.

[0010] Further, the integrated display and control knob includes a body located in a middle and a rotation portion surrounding the body. An outer side of the rotation portion is also used as an outer side surface of the entire knob. A first display apparatus is arranged on a front end surface of the body; and a second display apparatus is arranged on the outer side surface. Selection of displayed contents on the first display apparatus and/or the second display apparatus is realized through rotation of the rotation portion.

[0011] Preferably, the rotation portion of the control knob has a shape of a cylinder, a truncated cone or a polygon prism.

[0012] Preferably, the first display apparatus adopts a touch display screen.

[0013] Preferably, the second display apparatus has a structural form which combines a built-in LED lamp and preset printed words.

[0014] Further, the control knob can be integrally pressed downwards, and a pressing action can act as confirmation of selected contents.

[0015] Specifically, the first display apparatus is configured to display state information in an operation process of the controlled washing machine and/or display an interaction interface of a control procedure.

[0016] Specifically, the second display apparatus is configured to display a plurality of selection items in the control procedure.

[0017] To enable the surface of the machine body to be simpler, the control knob can protrude or contract from the control disk seat according to an energized or de-energized state of the washing machine.

[0018] In the fully automatic washing machine of the present invention, the integrated display and control knob replaces an existing knob and a control mode of a display screen is used, so that an entire operation panel is re-

placed. The washing machine has a simpler appearance, and is arranged on the front side surface of the machine body without occupying an upper surface of the control disk seat, so that the upper cover plate of the throwing inlet for throwing clothes forms the entire upper top surface of the washing machine. The washing machine has a larger clothes throwing port, so that use is convenient. A corresponding procedure of the integrated display and control knob and display contents can be modified conveniently through a background controller, so that hardware has strong compatibility; meanwhile, a use habit of consumers is not changed; and use can be convenient.

BRIEF DESCRIPTION OF DRAWINGS

[0019]

Fig. 1 is a schematic diagram illustrating an integral structure of a fully automatic washing machine of the present invention;

Fig. 2 is a schematic structural diagram illustrating a fully automatic washing machine without an upper cover plate in the present invention;

Fig. 3 is a detailed local diagram illustrating an integrated display and control knob in embodiments;

Fig. 4 is a use state diagram illustrating an integrated display and control knob in embodiments;

Fig. 5 is a schematic diagram illustrating an integrated display and control knob when a rotation portion has a shape of a polygon prism in embodiments;

Fig. 6 is a side view of Fig. 5;

Fig. 7 is a schematic diagram illustrating an integrated display and control knob when a rotation portion has a shape of a truncated cone in embodiments; and

Fig. 8 is a side view of Fig. 7.

[0020] In the figures:

1: Housing; 2: Control disk seat; 3: Upper cover plate; 4: Integrated display and control knob; 5: Start-stop button; 6: Power button; 7: Throwing inlet; 8: Body; 9: Rotation portion.

DETAILED DESCRIPTION

[0021] The technical solution of the present invention will be further described below in combination with drawings through specific embodiments.

[0022] Fig. 1-Fig. 2 are schematic structural diagrams illustrating a fully automatic washing machine of specific embodiments of the present invention. The fully automatic washing machine includes a housing 1, a control disk seat 2 and an upper cover plate 3. The control disk seat 2 is located on a top of the housing 1. A clothes throwing inlet 7 is formed in the control disk seat. The upper cover plate 3 is rotatably arranged on the control disk seat 2 to open or close the clothes throwing inlet 7. The corre-

sponding control disk seat 2 is configured to accommodate a corresponding entire control circuit board, and is also generally configured to install a conventional control and display apparatus on the upper surface. Different from a conventional fully automatic washing machine, the washing machine of the present invention is provided with an integrated display and control knob 4 on the upper portion of the front side surface. A power button 6 and a start-stop button 5 are symmetrically arranged on both horizontal sides of an installation position of the integrated display and control knob 4 respectively, or the power button 6 and the start-stop button 5 are jointly arranged on one side of the control knob 4. At the same time of omitting an individual display screen, the power button 6, the start-stop button 5 and the integrated display and control knob 4 are not installed on the upper surface of the control disk seat 2 unlike a traditional washing machine; and a control device does not occupy a space of the upper surface of the control disk seat 2. Therefore, the clothes throwing inlet 7 of the washing machine can be made to be as large as possible, which is convenient for taking in and out the clothes during use. Meanwhile, a water inlet of the washing machine is formed in a rear side surface of the control disk seat; and a detergent throwing inlet is formed in the clothes throwing inlet 7, so that an entire upper top surface of the washing machine is formed in a closed state of the upper cover plate 3. The entire washing machine has a simpler appearance, and also has a modern style.

[0023] Further, to enable the entire washing machine to have a simpler appearance, the integrated display and control knob 4 is arranged on a center line of the front side surface of the washing machine.

[0024] To facilitate use, the corresponding integrated display and control knob 4 is located in a range above 4/5 of an entire height of the washing machine. Within this range, the integrated display and control knob 4 can be installed on a front side surface of the housing 1 or a front side surface of the control disk seat 2. Meanwhile, to consider a height of a user and generate a better visual angle during operation, accordingly, during design and production, the front side surface of the control disk seat in which the integrated display and control knob 4 is correspondingly installed is inclined towards the rear side of the entire machine body.

[0025] Different from an existing fully automatic washing machine, the above fully automatic washing machine of the present invention adopts the integrated display and control knob 4 which includes a body 8 located in a middle and a rotation portion 9 surrounding the body. An outer side of the rotation portion 9 is also used as an outer side surface of the entire knob. A first display apparatus is arranged on a front end surface of the body 8; and a second display apparatus is arranged on the outer side surface. Selection of displayed contents on the first display apparatus and/or the second display apparatus is realized through rotation of the rotation portion. The control knob can be integrally pressed downwards, and a

pressing action can act as confirmation of selected contents. As an additional alternative mode, the above first display apparatus adopts a touch display screen. A corresponding confirmation key is displayed with software on a corresponding touch display screen to perform confirmation operation.

[0026] As a production mode which saves cost, the second display apparatus can also be designed into a structural form which combines a built-in LED lamp and preset printed words.

[0027] As shown in Fig. 3 and Fig. 4, a schematic structural diagram of the above control knob and a corresponding use state diagram are given. The first display apparatus is configured to display state information in an operation process of the controlled washing machine and/or display an interaction interface of a control procedure. The second display apparatus is configured to display a plurality of selection items in the control procedure.

[0028] As a further improvement, as shown in Fig. 5 and Fig. 6, the rotation portion of the corresponding control knob can adopt a shape of a cylinder, a truncated cone or a polygon prism, so as to have a better operation visual angle.

[0029] Further, under a condition of energizing the washing machine, the control knob can protrude from the control disk seat; and a procedure can be selected to control the washing machine by operating the knob. Similarly, when washing is completed and the washing machine is de-energized, the control knob can contract from the control disk seat, and keeps level with the front side surface of the control disk seat of the washing machine and is beautiful.

[0030] Technical principles of the present invention are described above in combination with specific embodiments. These descriptions are only used for explaining the principles of the present invention, and are not interpreted as limitations to a protection scope of the present invention in any way. Based on explanation herein, those skilled in the art can contemplate other specific embodiments of the present invention without contributing creative labor. These embodiments shall fall into the protection scope of the present invention.

Claims

1. A fully automatic washing machine, comprising a housing, a control disk seat and an upper cover plate, wherein the control disk seat is located on a top of the housing, and a clothes throwing inlet is formed in the control disk seat; the upper cover plate is rotatably arranged on the control disk seat so as to open or close the clothes throwing inlet, wherein an integrated display and control knob is arranged on an upper portion of a front side surface of the washing machine; and an entire upper top surface of the washing machine is formed in a closed state of the upper cover plate.

2. The fully automatic washing machine according to claim 1, wherein the integrated display and control knob is located in a range above 4/5 of an entire height of the washing machine.

3. The fully automatic washing machine according to claim 1, wherein a power button and a start-stop button are symmetrically arranged on both sides of an installation position of the integrated display and control knob respectively, or the power button and the start-stop button are arranged on one side of the installation position of the integrated display and control knob.

4. The fully automatic washing machine according to claim 2, wherein the integrated display and control knob is installed on a front side surface of the housing or a front side surface of the control disk seat.

5. The fully automatic washing machine according to claim 4, wherein the front side surface of the control disk seat is a vertical surface or an inclined surface which is inclined towards a rear side of an entire machine body.

6. The fully automatic washing machine according to claim 1, wherein the integrated display and control knob comprises a body located in a middle and a rotation portion surrounding the body; wherein an outer side of the rotation portion is also used as an outer side surface of the entire knob; a first display apparatus is arranged on a front end surface of the body; a second display apparatus is arranged on the outer side surface; and selection of displayed contents on the first display apparatus and/or the second display apparatus is realized through rotation of the rotation portion.

7. The fully automatic washing machine according to claim 6, wherein the rotation portion of the control knob has a shape of a cylinder, a truncated cone or a polygon prism.

8. The fully automatic washing machine according to claim 6, wherein the first display apparatus adopts a touch display screen.

9. The fully automatic washing machine according to claim 6, wherein the second display apparatus has a structural form which combines a built-in LED lamp and preset printed words.

10. The fully automatic washing machine according to claim 6, wherein the control knob is pressable downwards integrally, and a pressing action can act as confirmation of selected contents.

11. The fully automatic washing machine according to

claim 6, wherein the first display apparatus is configured to display state information in an operation process of the controlled washing machine and/or display an interaction interface of a control procedure.

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12. The fully automatic washing machine according to claim 6, wherein the second display apparatus is configured to display a plurality of selection items in the control procedure.

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13. The fully automatic washing machine according to claim 6, wherein the control knob can protrude or contract from the control disk seat according to an energized or de-energized state of the washing machine.

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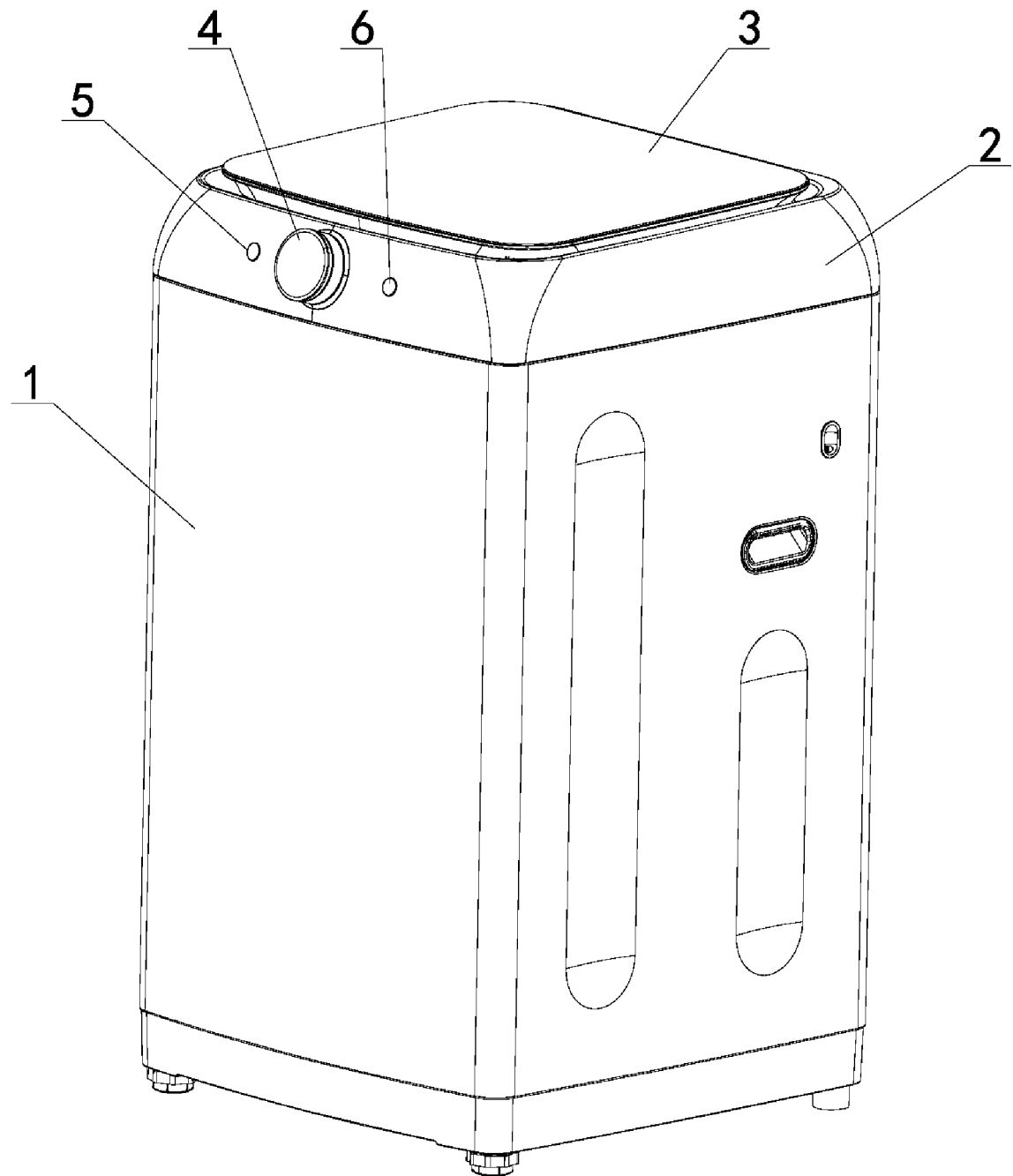


FIG. 1

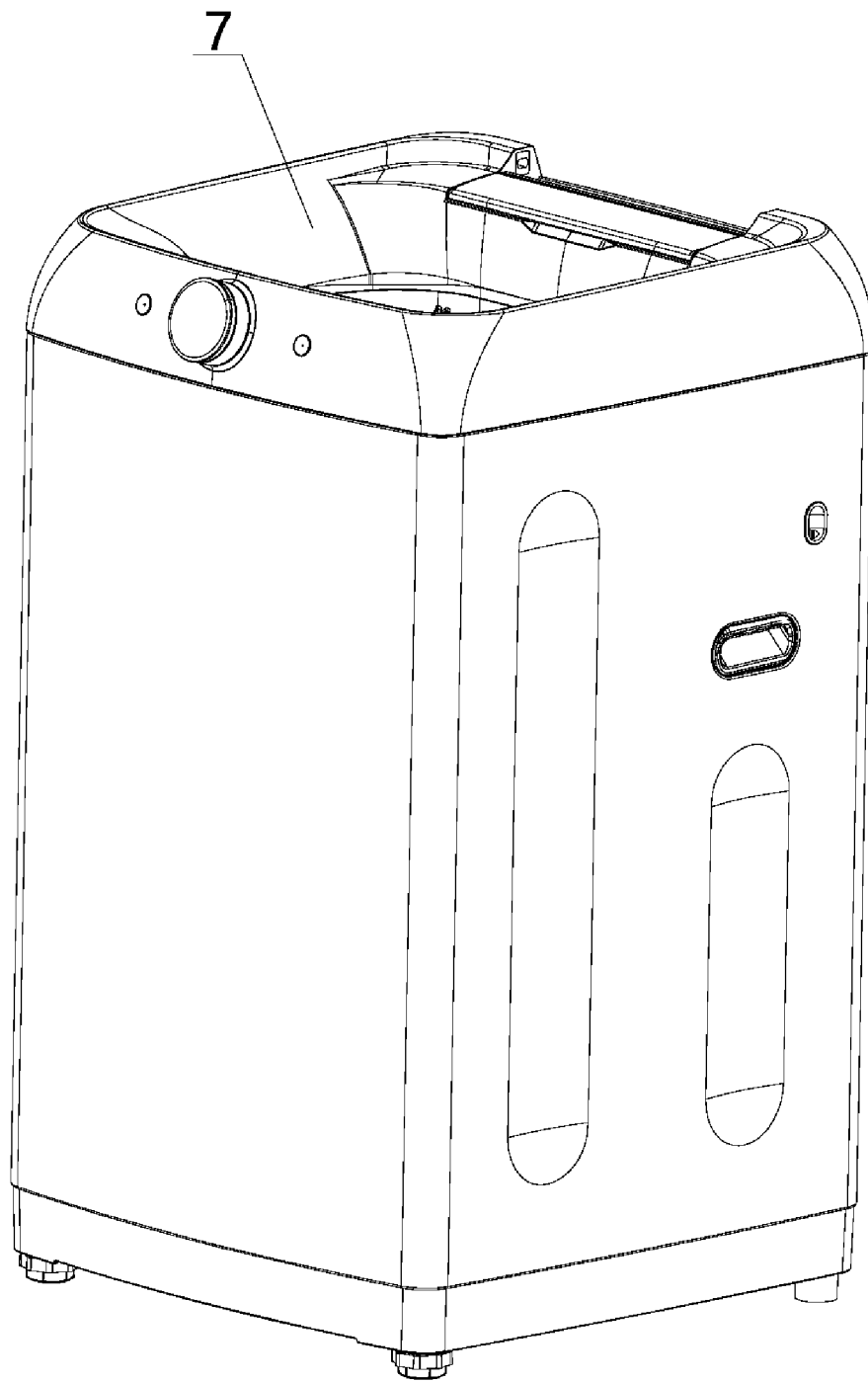


FIG. 2

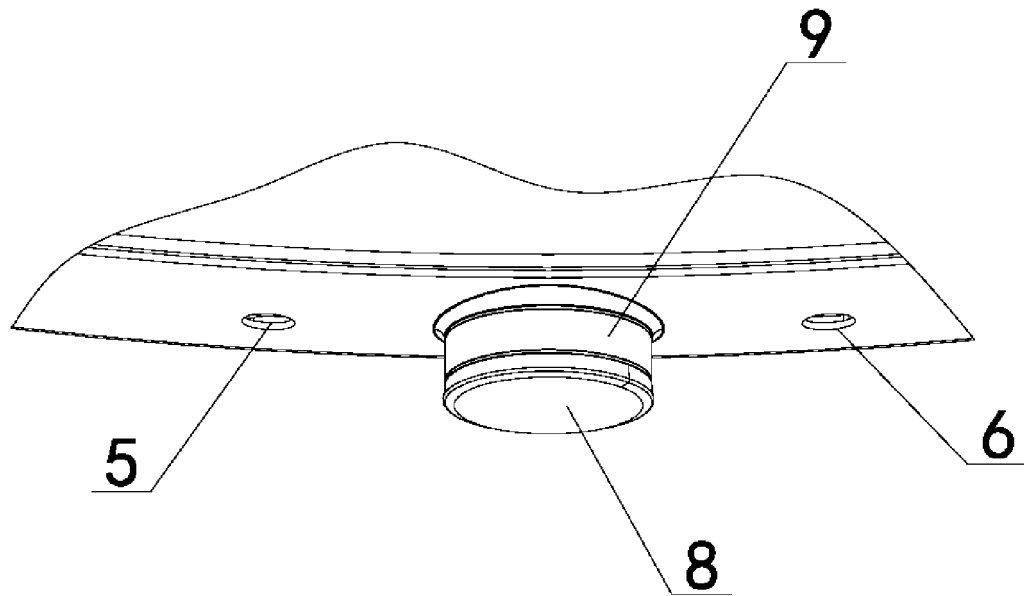


FIG. 3

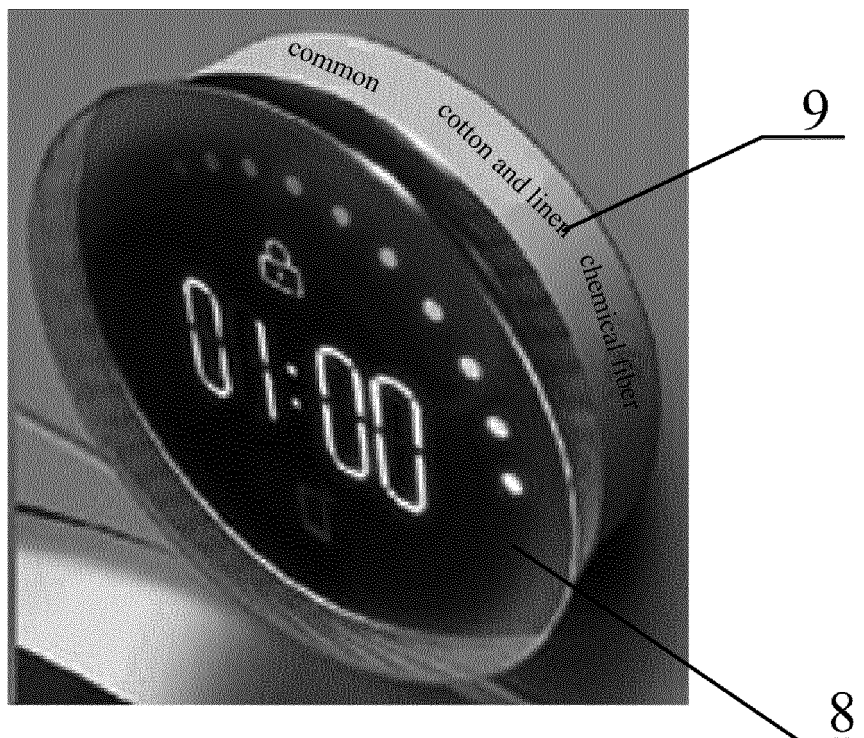


FIG. 4

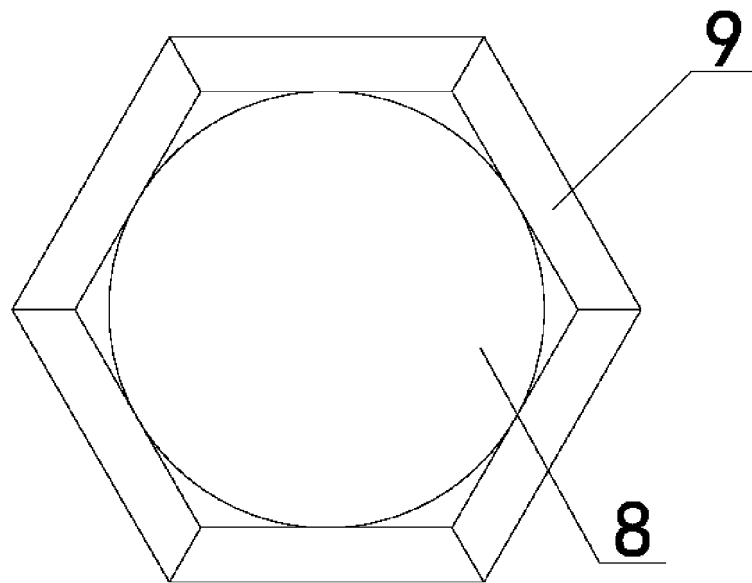


FIG. 5

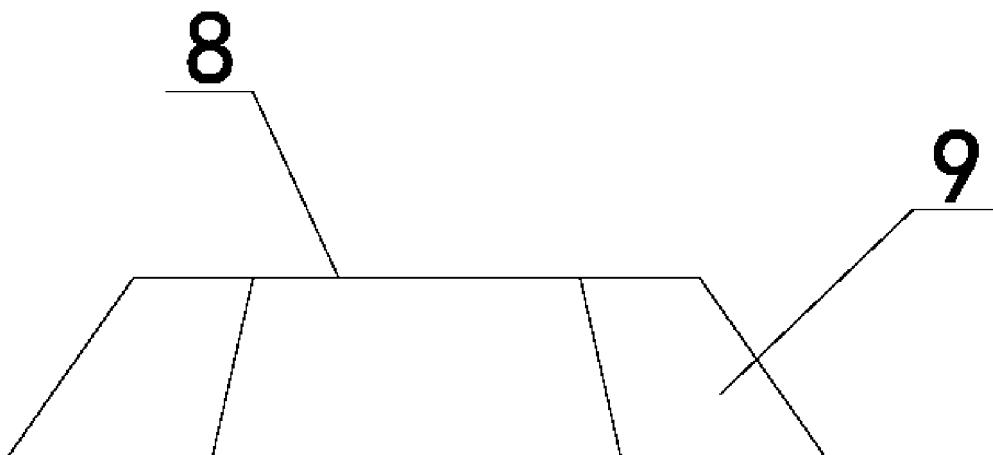


FIG. 6

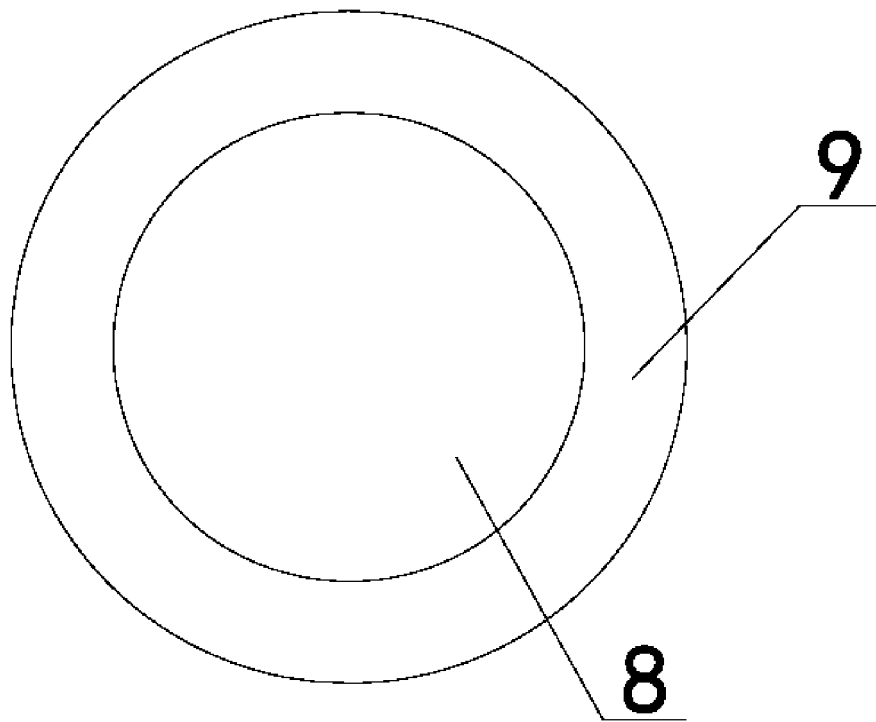


FIG. 7

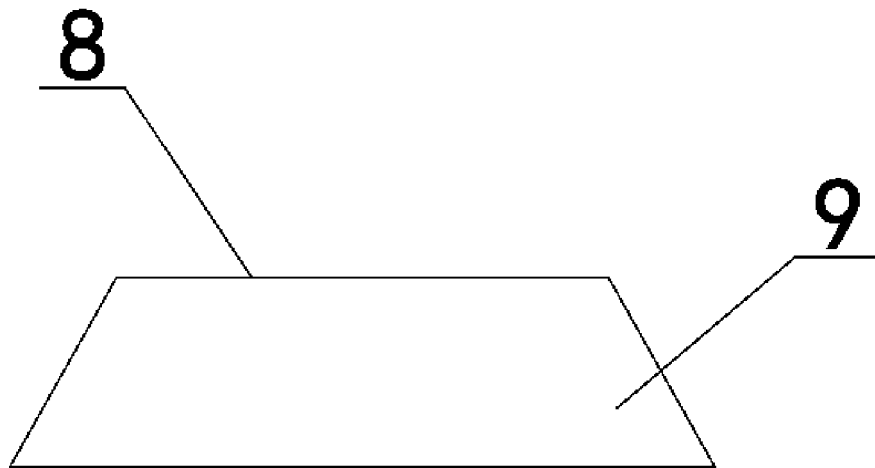


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2015/097571

A. CLASSIFICATION OF SUBJECT MATTER

D06F 37/28 (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: control board, operation board, rotary knob, top, top cover, table surface, upper-open, top plate, top-open, front end, front side, impeller; LITTLE SWAN; panel, body, board, cabnient, mainbody, lid, upper+, front, casing, case, button, knob, cover

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 1508334 A (LG ELECTRONICS (TIANJIN) APPLIANCES CO., LTD.), 30 June 2004 (30.06.2004), claim 1, and figure 1	1-13
A	CN 203559281 U (NINGBO QISHUAI ELECTRICAL APPLIANCE CO., LTD.), 23 April 2014 (23.04.2014), the whole document	1-13
A	JP 2013027416 A (SHARP KK), 07 February 2013 (07.02.2013), the whole document	1-13

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

* Special categories of cited documents:

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“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search
12 March 2016 (12.03.2016)Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2015/097571

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 1508334 A	30 June 2004	CN 100451217 C	14 January 2009
CN 203559281 U	23 April 2014	None	
JP 2013027416 A	07 February 2013	None	

Form PCT/ISA/210 (patent family annex) (July 2009)