

FIG. 1

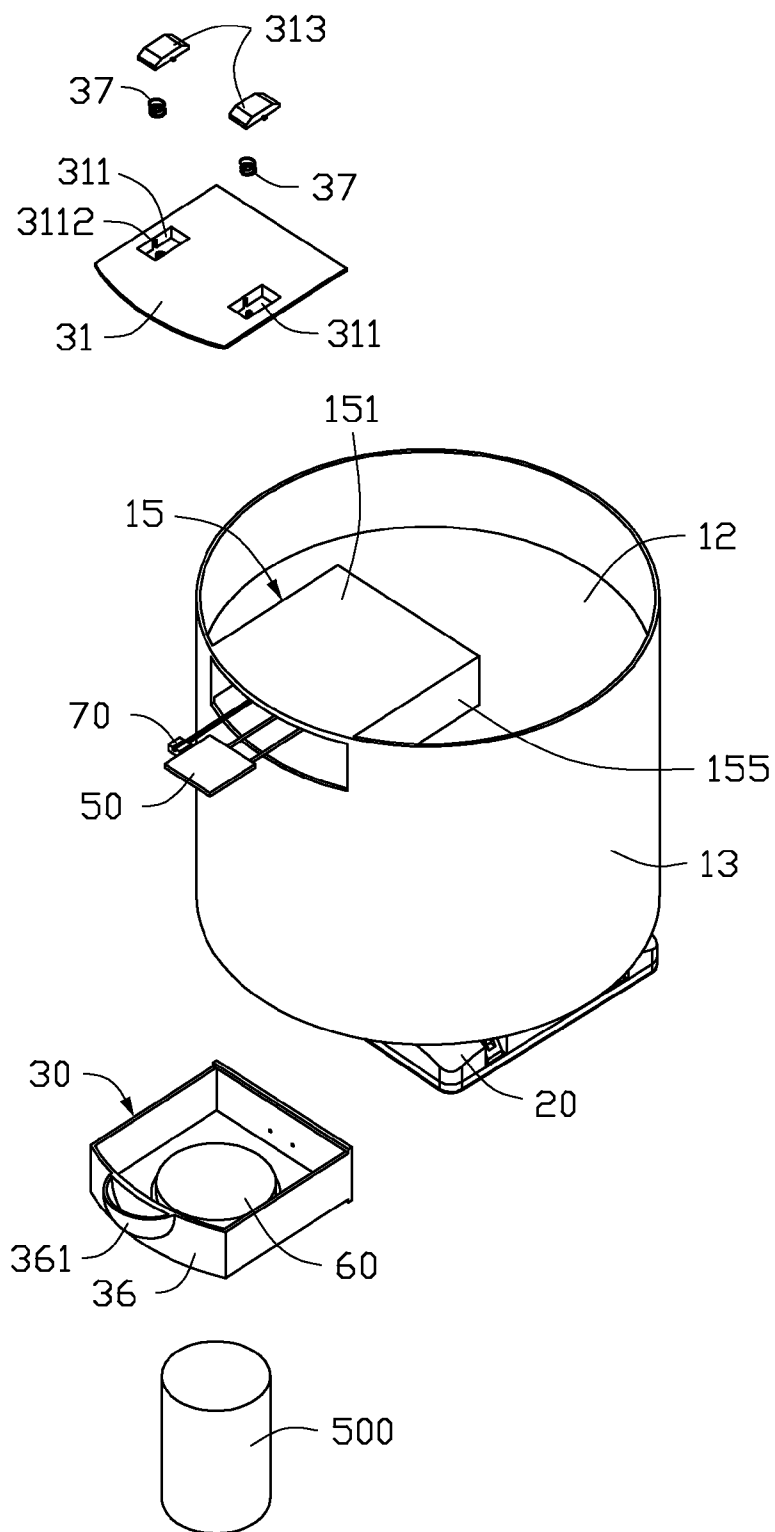


FIG. 2

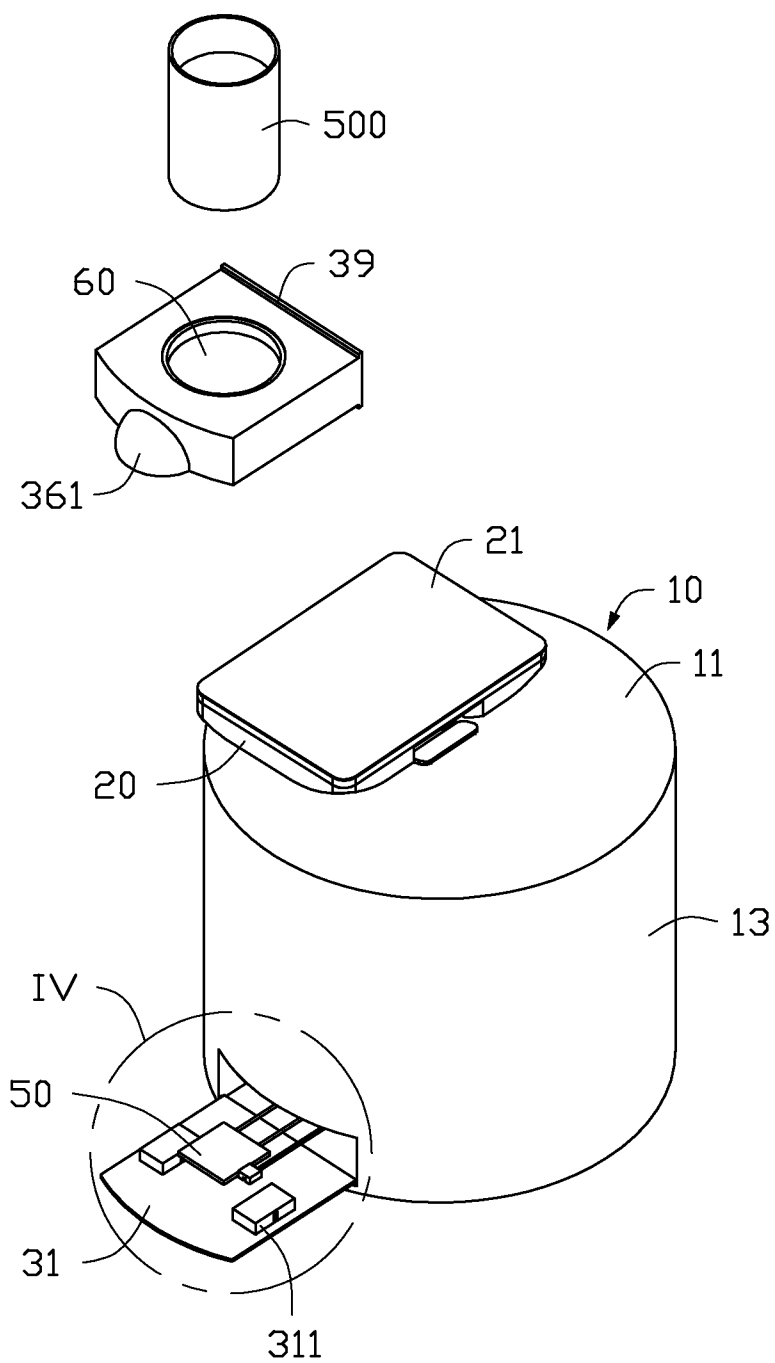


FIG. 3

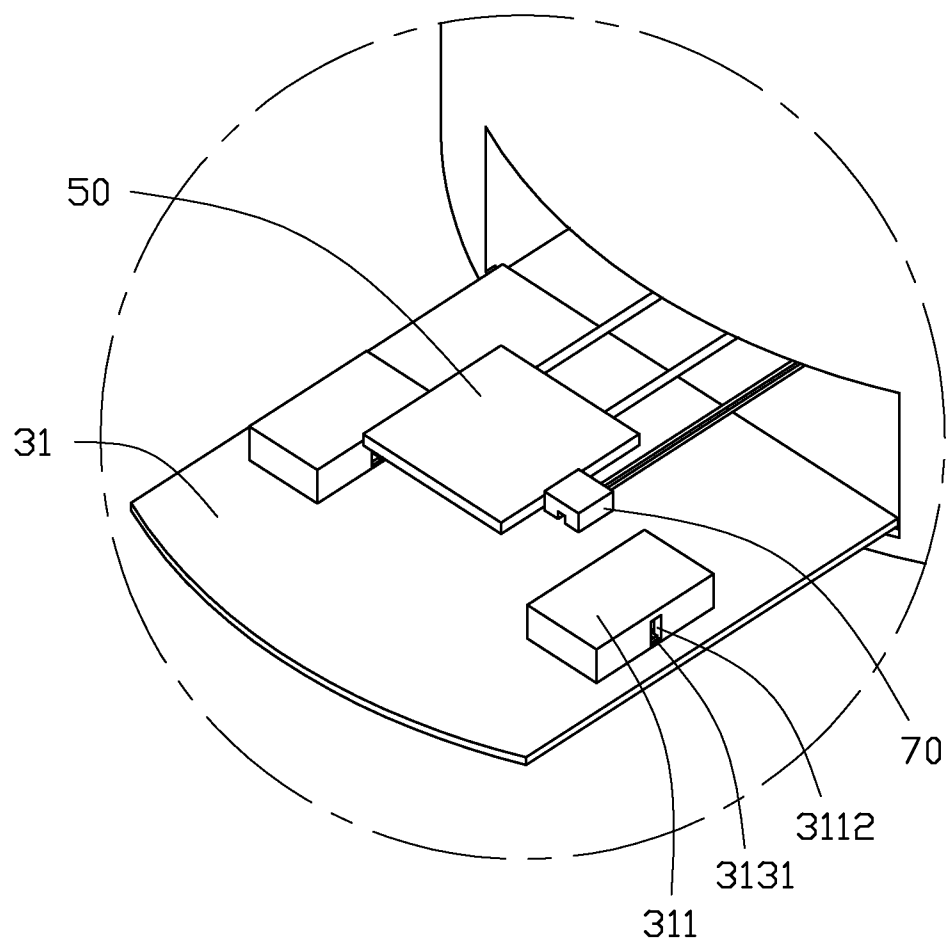


FIG. 4

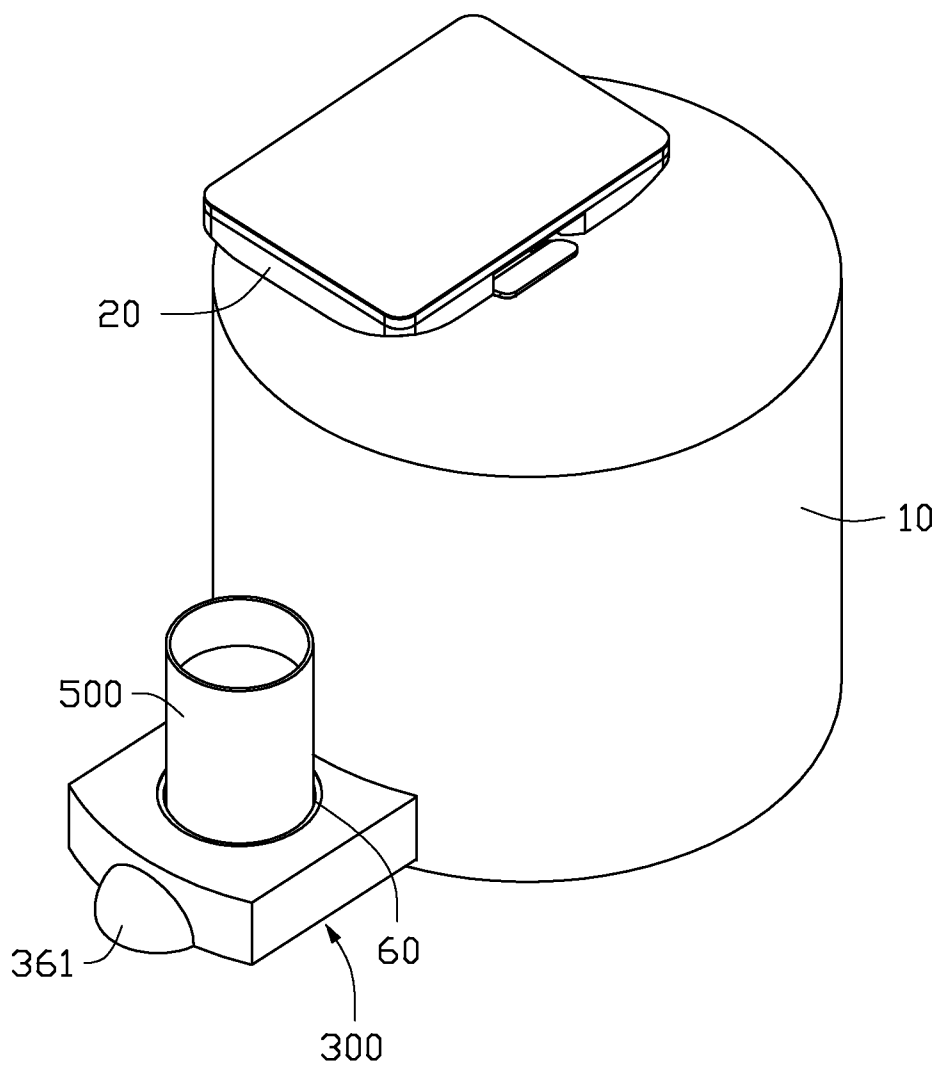


FIG. 5

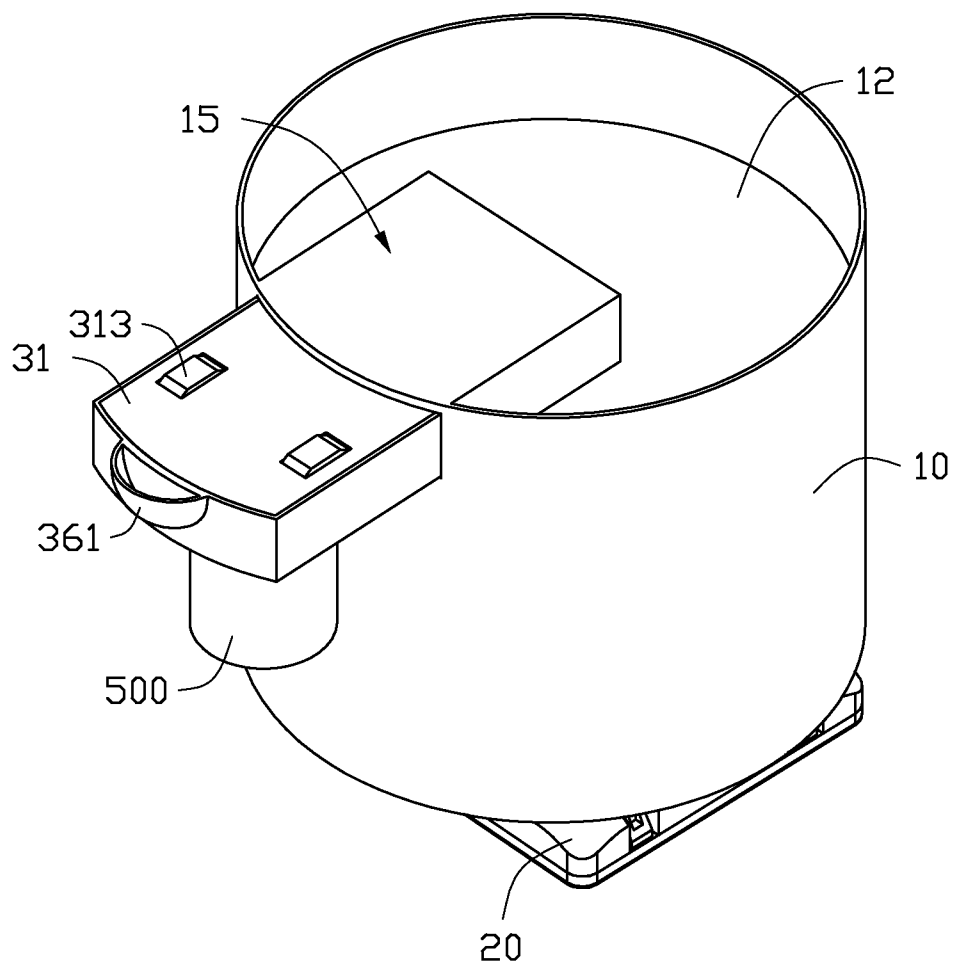


FIG. 6

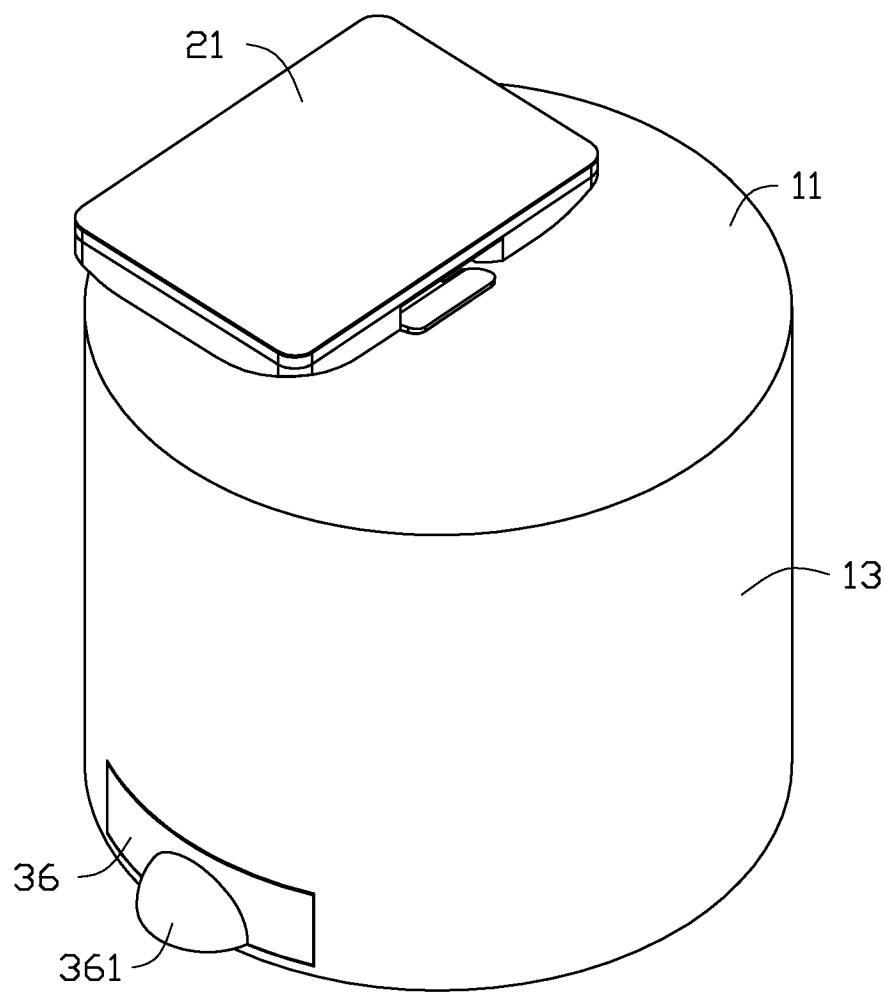


FIG. 7



## AUTOMATIC PILL DISPENSER WITH WATER HEATER

### FIELD

**[0001]** Embodiments of the present disclosure relate to automatic pill dispensers, and particularly to an automatic pill dispenser with a water heater.

### BACKGROUND

**[0002]** Certain pill medications are best consumed with warm water. An automatic pill dispenser generally provides a function that dispenses pills automatically. In some cold areas or in winter, heated water cools quickly, and the patient consuming pills may be required to transfer heated water from a vacuum flask, which can be very inconvenient if a pill regimen is large. Therefore, there is room for improvement in the art.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0003]** Many aspects of the embodiments can be better understood with reference to the following drawings. The components in the drawings are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the embodiments. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

**[0004]** FIG. 1 is an exploded, isometric view of one embodiment of an automatic pill dispenser.

**[0005]** FIG. 2 is similar to FIG. 1, but viewed from a different aspect.

**[0006]** FIG. 3 is a partially assembled, isometric view of the automatic pill dispenser of FIG. 1.

**[0007]** FIG. 4 is an enlarged view of circled portion IV of the automatic pill dispenser of FIG. 3.

**[0008]** FIG. 5 is an assembled, isometric view of the automatic pill dispenser of FIG. 1, showing a heater in an opened position.

**[0009]** FIG. 6 is similar to FIG. 5, but viewed from a different aspect.

**[0010]** FIG. 7 is similar to FIG. 5, but showing the heater in a closed position.

### DETAILED DESCRIPTION

**[0011]** The disclosure is illustrated by way of example and not by way of limitation in the figures of the accompanying drawings in which like references indicate similar elements. It should be noted that references to “an” or “one” embodiment in this disclosure are not necessarily to the same embodiment, and such references mean “at least one.”

**[0012]** FIG. 1 and FIG. 2 show one embodiment of an automatic pill dispenser. The automatic pill dispenser includes a housing 10, a controller 20, a display 21, and a heater 300.

**[0013]** The housing 10 is used for receiving pill picking structures (not shown), such as a plurality of pill cases and picking arms. The housing 10 includes a top wall 11, a bottom wall 12, and a ring wall 13 connected between the top wall 11 and the bottom wall 12. In one embodiment, the top wall 11 is substantially parallel to the bottom wall 12. The top wall 11 secures the controller 20. A receiving case 15 is located in a bottom surface of the bottom wall 12. The receiving case 15 includes a bottom plate 151, a rear plate (not shown), and two side plates 155. In one embodiment, the bottom plate 151 is

substantially parallel to the bottom wall 12, the rear plate is substantially perpendicular to the side plates 155, and the bottom plate 151, and the side plates 155 are substantially perpendicular to the bottom plate 151 and the bottom wall 12. The receiving case 15 receives the heater 300.

**[0014]** The heater 300 includes a box 30, an installation plate 31, an electric heating plate 50, a conducting strip 60, and a temperature sensor 70.

**[0015]** The box 30 includes a top board 32, two side boards 35, and a front board 36. In one embodiment, the top board 32 is substantially parallel to the installation plate 31 and substantially perpendicular to the side boards 35. Two pressed portions 311 extend from the installation plate 31. Each pressed portion 311 defines two limiting slots 3112. The top board 32 defines an opening 321. In one embodiment, the opening 321 is circular. A flange 39 perpendicularly extends from each of the installation plate 31, the top board 32, and the side boards 35. The flange 39 engages with edges of the receiving case 15, to prevent the heater 300 from moving out of the receiving case 15. An operation portion 361 protrudes from the front board 36, and the operation portion 361 is hollow and operable to allow the heater 300 to slide.

**[0016]** The box 30 further includes two limiting blocks 313 and two resilient members 37. Each pressed portion 322 receives one of the resilient members 37. The resilient members 37 elastically mount the limiting blocks 313. In one embodiment, each resilient member 37 is a compressed spring.

**[0017]** The electronic heating plate 50 is electronically connected to the controller 20. The controller 20 controls the electronic heating plate 50 to heat up or to stop heating.

**[0018]** The conducting strip 60 includes a flat portion 61 and a ring portion 63 extending from a ring edge of the flat portion 61. A limiting space 65 is defined by the flat portion 61 and the ring portion 63. The limiting space 65 is a placement for a cup 500. In one embodiment, the flat portion 61 is circular, and a diameter of the flat portion 61 is substantially equal to a diameter of the opening 321.

**[0019]** The temperature sensor 70 senses temperatures of the electronic heating plate 50 and sends information as to the temperatures to the controller 20.

**[0020]** FIGS. 3-7 show that in assembly, the limiting block 313 is moved to be aligned with the pressed portion 311. A first end of the resilient member 37 is secured to a top end of the pressed portion 311, and a second end of the resilient member 37 is secured to the limiting block 313. The limiting block 313 is moved to slidably receive the limiting piece 3131 in the limiting slot 3112. Thus, the limiting block 313 is slidably received in the pressed portion 311. When the resilient member 37 is uncompressed, a part of the limiting block 313 extends out of the installation plate 31. The limiting block 313 can be pressed to elastically deform the resilient member 37 into the pressed portion 311. The conducting strip 60 is located in the opening 321, and the ring portion 63 is secured to the edges of the opening 321. The electronic heating plate 50 is secured under the flat portion 61. The temperature sensor 70 is secured to the electronic heating plate 50. The box 30 is secured to the installation plate 31 by screws or other methods. Thus, the heater 300 is assembled completely.

**[0021]** The heater 300 is slantingly placed in the receiving case 15. The heater 300 is slid into the receiving case 15 until it abuts the rear plate 153, the limiting block 313 is pressed upwards by the bottom plate 151, and the resilient member 37 is elastically deformed. The resilient member 37 exerts elastic

force on the heater 300 to engage the heater 300 with the receiving case 15. The front board 36 covers the receiving case 15. In this position, the heater 300 is located in a closed position (as shown in FIG. 7).

[0022] In use, the controller 20 controls the display 21 to display a message inviting a user to request hot water when the automatic pill dispenser starts to pick pills. If the user chooses yes, the controller 20 controls the display 21 to display a message to prompt the user to pull out the heater 300 and put the cup 500 on the heater 300. Then the box 30 is slid out of the receiving case 15 through the operation portion 361, the resilient member 37 rebounds to release the limiting block 313 to abut a surface supporting the automatic pill dispenser, and the heater 300 is in an opened position. A moving direction of the limiting block 313 is substantially perpendicular to a sliding direction of the box 30. The cup 500 is placed in the limiting space 65. The limiting block 313 abuts the supporting surface to prevent the heater 300 and the cup 500 from hanging in the air and dropping. The electronic heating plate 50 heats water in the cup 500 through the conducting strip 60. The temperature sensor 70 senses the temperature of the electronic heating plate 50 and sends temperature information to the controller 20. The controller 20 compares the sent temperature with a preset temperature and stops the electronic heating plate 50 when the sent temperature is greater than the preset temperature. In at least one embodiment, the preset temperature can be about 80 degrees, for example. Other preset temperatures are possible within this disclosure.

[0023] It is to be understood, however, that even though numerous characteristics and advantages have been set forth in the foregoing description of embodiments, together with details of the structures and functions of the embodiments, the disclosure is illustrative only and changes may be made in detail, especially in the matters of shape, size, and the arrangement of parts within the principles of the disclosure, to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. An automatic pill dispenser, comprising:
  - a housing configured for receiving a plurality of pill boxes;
  - a display secured to the housing;
  - a heater secured to the housing and configured for placing a cup; and
  - a controller electronically connected to the heater;
 wherein the controller controls the display to display a message indicating a need for hot water; and the controller starts the heater to heat water in the cup when the hot water is needed.
2. The automatic pill dispenser of claim 1, wherein the heater comprises an electronic heating plate and a conducting strip, the conducting strip is mounted on the electronic heating plate, and the conducting strip is configured for placing the cup thereon.
3. The automatic pill dispenser of claim 2, wherein the heater further comprises a temperature sensor, the temperature sensor senses a temperature of the electronic heating plate and sends the temperature to the controller; the controller compares the temperature to a preset temperature and controls the electronic heating plate to stop heating when the temperature is greater than the preset temperature.
4. The automatic pill dispenser of claim 2, wherein the heater further comprises a box, the electronic heating plate comprises a flat portion and a ring portion extending from

edges of the flat portion; and a limiting space is defined by the flat portion and the ring portion for receiving the cup.

5. The automatic pill dispenser of claim 4, wherein the housing comprises a top wall, a bottom wall opposite to the top wall, a ring wall connected to the top wall and the bottom wall, and a receiving case extending from the bottom wall; the controller and the display are secured to the top wall; and the heater is slidably received in the receiving case.

6. The automatic pill dispenser of claim 5, wherein the heater further comprises an installation plate, a limiting block, and a pressed portion extending from the installation plate; the installation plate is secured to the box; the limiting block is slidably received in the pressed portion; the heater is slidable relative to the housing between a closed position and an opened position; when the heater is in the closed position, the limiting block is received in the receiving case and in the pressed portion; and when the heater is in the opened position, the limiting block is slid out of the receiving case and the pressed portion.

7. The automatic pill dispenser of claim 6, wherein the limiting block comprises a limiting piece, the pressed portion defines a limiting slot, and the limiting piece is slidably received in the limiting slot.

8. The automatic pill dispenser of claim 6, wherein a sliding direction of the limiting block is substantially perpendicular to a sliding direction of the box.

9. The automatic pill dispenser of claim 6, wherein the heater further comprises a resilient member secured between the limiting block and a top end of the pressed portion; when the heater is in the closed position, the limiting block compresses the resilient member; and when the heater is in the opened position, the resilient member is released.

10. The automatic pill dispenser of claim 6, wherein the box further comprises a top board and a front board; the top board is substantially parallel to the installation plate; the conducting strip is mounted on the top board; and an operation portion protrudes from the front board, and the operation portion is operable to slide the heater.

11. An automatic pill dispenser, comprising:
 

- a housing configured for receiving a plurality of pill boxes and defining an opening;
- a heater slidably mounted to the housing and comprising a box, an installation plate secured to the box, an electronic heating plate secured to the installation plate, and a conducting strip secured to the box and configured for placing a cup thereon; and
- a controller electronically connected to the heater;

 wherein the heater is slidable relative to the housing between a closed position and an opened position; when the heater is in the closed position, the heater is received in the housing and covers the opening; and when the heater is in the opened position, the heater slides out of the opening, the controller controls is capable of controlling the electronic heating plate to heat water in the cup through the conducting strip.

12. The automatic pill dispenser of claim 11, further comprising a display secured to the housing, wherein the controller controls the display to display a message indicating a need for hot water; and the controller starts the heater to heat water when the hot water is needed.

13. The automatic pill dispenser of claim 12, wherein the heater further comprises a temperature sensor, the temperature sensor senses a temperature of the electronic heating plate and sends the temperature to the controller; the control-

ler compares the temperature to a preset temperature and controls the electronic heating plate to stop heating when the temperature is greater than the preset temperature.

**14.** The automatic pill dispenser of claim **11**, wherein the electronic heating plate comprises a flat portion and a ring portion extending from edges of the flat portion; and a limiting space is defined by the flat portion and the ring portion for receiving the cup.

**15.** The automatic pill dispenser of claim **11**, wherein the housing comprises a top wall, a bottom wall opposite to the top wall, a ring wall connected to the top wall and the bottom wall, and a receiving case extending from the bottom wall; the controller and the display are secured to the top wall; and the heater is slidably received in the receiving case.

**16.** The automatic pill dispenser of claim **11**, wherein the heater further comprises a limiting block and a pressed portion extending from the installation plate, and the limiting block is slidably received in the pressed portion; when the heater is in the closed position, the limiting block is received in the receiving case and in the pressed portion; and when the heater is in the opened position, the limiting block is slid out of the receiving case and the pressed portion.

**17.** The automatic pill dispenser of claim **16**, wherein the limiting block comprises a limiting piece, the pressed portion defines a limiting slot, and the limiting piece is slidably received in the limiting slot.

**18.** The automatic pill dispenser of claim **16**, wherein a sliding direction of the limiting block is substantially perpendicular to a sliding direction of the box.

**19.** The automatic pill dispenser of claim **16**, wherein the heater further comprises a resilient member secured between the limiting block and a top end of the pressed portion; when the heater is in the closed position, the limiting block compresses the resilient member; and when the heater is in the opened position, the resilient member is released.

**20.** The automatic pill dispenser of claim **11**, wherein the box further comprises a top board and a front board; the top board is substantially parallel to the installation plate; the conducting strip is mounted on the top board; and an operation portion protrudes from the front board, and the operation portion is operable to translatably slide the heater.

\* \* \* \* \*