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DEVICE FOR SENSING AND ALARMING ABSENCE OF WATER IN A HOME
MACHINE FOR MANUFACTURING SOYBEAN MILK, WATERY BEAN CURD, AND
BEAN CURD

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BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates to a device for sensing and
alarming absence of water in a home machine for manufacturing
10 soybean milk, watery bean curd, and bean curd, and more
particularly to a device for sensing and alarming absence of
water in a home machine for manufacturing soybean milk, watery
bean curd, and bean curd, which allows the home manufacturing
machine to be operated only when the home manufacturing machine
15 contains water, so as to prevent the machine from being
operated by a user without water, thereby preventing the
machine from getting damaged.

Description of the Prior Art

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A conventional method for domestic use which manufactures
soybean milks, watery bean curds, and bean curds will be
described herein below.

First, the soybeans are washed clean. The washed beans
are then soaked and made swollen in the water for several hours
25 to be easily pulverized. The swollen beans are pulverized by

using a millstone or a mixer, so that raw bean juice is produced. The raw bean juice is divided into bean-curd refuse and protein juice using a fine sieve gin or cloth. The divided protein juice is put in a kettle or a receptacle and boiled.

5 At this time, since froth inevitably forms and causes the kettle or receptacle to overflow, the protein juice is boiled while repeatedly and artificially adjusting thermal power with care so that the froth does not overflow. After boiling the protein juice enough, an addition such as sugar or salt is put

10 in the boiled protein juice to manufacture potable soybean milk. Also, after boiling the protein juice enough, a predetermined amount of coagulating agent such as calcium sulfate or the like is added to the boiled protein juice. After the coagulating agent-added protein juice is stirred,

15 when several minutes elapse, it becomes a watery bean curd. The watery bean curd is put in a forming device and compressed and formed to manufacture bean curd.

However, in the conventional method for domestic use which manufactures soybean milks, watery bean curds, and bean

20 curds, since several processes are separately performed, it is inconvenient. Since the manufacturing process is complicated and it takes a lot of time, the conventional method is inefficient. In particular, it takes a lot of time to make the beans swell. It is difficult to suitably adjust the amount of

25 beans. The recovery rate of the protein juice is relatively

low and it is difficult to manage a clean status.

In order to solve such problems, apparatuses capable of simply and conveniently manufacturing soybean milks, watery bean curds, and bean curds are proposed. Hereinafter, such conventional apparatus for domestic use which manufactures soybean milks, watery bean curds, and bean curds will be described with reference to FIG. 1.

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FIG. 1 is a sectional view for showing a conventional apparatus for domestic use which manufactures soybean milks, watery bean curds, and bean curds. As shown in FIG. 1, the conventional apparatus includes a body 1, a driving motor 2, a short driving shaft 3, a long driving motor 4, a knife edge 5, a heater 6, and a temperature sensor 7. A cover is installed at an upper portion of the body 1. The body 1 is opened and closed by the cover. The driving motor 2 is installed at the cover of the body 1. When a power is applied to the driving motor 2, the driving motor 2 provides a rotating power. The short driving shaft 3 serves as a rotary shaft of the driving motor 2. The long driving motor 4 is detachably fitted to the shorter driving motor 3. The knife edge 5 is connected to an end portion of the long driving motor 4. The heater 6 heats contents included in the body 1. The temperature sensor 7

senses a heating temperature of the contents included in the body 1.

An operation of the conventional apparatus for domestic use which manufactures soybean milks, watery bean curds, and
5 bean curds will now be explained.

When a user puts beans and water into the interior of the body 1 and inputs a power to a controller(not shown), the controller operates the driving motor 2. Then the driving motor 2 controls the knife edge 5 to pulverize the beans and
10 water. The controller operates the heater 6 and the temperature sensor 7 to perform a series of processes, in which the beans and water are heated at a predetermined temperature, so that the soybean milks, watery bean curds, and bean curds are sequentially manufactured.

15 However, in the conventional apparatus for domestic use which manufactures soybean milks, watery bean curds, and bean curds, in order to manufacture the soybean milks, watery bean curds, and bean curds, water is absolutely necessary. If a user operates the conventional apparatus in a state in which a
20 proper amount of water is not put into the interior of the body, the contents included in the body are spoilt and the conventional apparatus gets damaged.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art, and an object of the present invention is to provide a device for sensing and alarming absence of water in a home machine for manufacturing soybean milk, watery bean curd, and bean curd, which allows the home manufacturing machine to be operated only when the home manufacturing machine contains water, so as to prevent the machine from being operated by a user without water, thereby preventing the machine from getting damaged.

10 In order to accomplish this object, there is provided a device for sensing and alarming absence of water in an apparatus for manufacturing soybean milk, watery bean curd, and bean curd, the apparatus being in domestic use, the apparatus including a plurality of components installed in a body, the device comprising: a ground electrode and a signal electrode electrically connected to two selected in the plurality of the components, respectively; a first resistor connected to the signal electrode; a first switching transistor connected to the first resistor; a controller connected to the first switching transistor for outputting a control signal for an alarm when the absence of the water is sensed; a second resistor connected to the controller; a second switching transistor connected to the second resistor; and a buzzer connected to the second switching transistor.

25 In this case, the ground electrode and the signal

electrode may be electrically connected to a heater and a short driving shaft, or to a heater and a filter net, or to a heater and an inner barrel, or to a first round bar and a second round bar, respectively.

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BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will be more apparent from the following
10 detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a sectional view for showing a conventional apparatus for domestic use which manufactures soybean milks, watery bean curds, and bean curds;

15 FIG. 2 is a circuitry diagram which shows a device for sensing and alarming absence of water in a home machine for manufacturing soybean milk, watery bean curd, and bean curd according to an embodiment of the present invention;

FIG. 3 is a sectional view for showing a device having two
20 electrodes which are electrically connected to a heater and a short driving shaft, respectively, which senses the absence of water in soybean milk, watery bean curd, and bean curd manufacturing apparatus for domestic use and generates an alarm signal indicative of the sensed result according to a first
25 embodiment of the present invention;

FIG. 4 is a sectional view for showing a device having two electrodes which are electrically connected to a heater and a filter net, respectively, which senses the absence of water in soybean milk, watery bean curd, and bean curd manufacturing apparatus for domestic use and generates an alarm signal indicative of the sensed result according to a second embodiment of the present invention;

FIG. 5 is a sectional view for showing a device having two electrodes which are electrically connected to a heater and an inner barrel, respectively, which senses the absence of water in soybean milk, watery bean curd, and bean curd manufacturing apparatus for domestic use and generates an alarm signal indicative of the sensed result according to a third embodiment of the present invention; and

FIG. 6 is a sectional view for showing a device having two electrodes which are electrically connected to a first round bar and a second round bar, respectively, which senses the absence of water in soybean milk, watery bean curd, and bean curd manufacturing apparatus for domestic use and generates an alarm signal indicative of the sensed result according to a fourth embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, a preferred embodiment of the present

invention will be described with reference to the accompanying drawings. In the following description and drawings, the same reference numerals are used to designate the same or similar components, and so repetition of the description on the same or
5 similar components will be omitted.

A device for sensing the absence of water in soybean milk, watery bean curd, and bean curd manufacturing apparatus for domestic use and generating an alarm signal indicative of the sensed result will be explained herein referring to FIG. 2
10 below. FIG. 2 is a circuitry diagram which shows the device for sensing and alarming absence of water in a home machine for manufacturing soybean milk, watery bean curd, and bean curd according to an embodiment of the present invention.

As shown in FIG. 2, the device includes a ground electrode
15 E1, a signal electrode E2, a resistor R24, a switching transistor Q9, a controller I.C1, a resistor R21, a switching transistor Q5, and a buzzer BUZ. The ground electrode E1 and the signal electrode E2 are connected to two selected in components installed in a body 1, respectively. The resistor
20 R24 is connected to the signal electrode E2. The switching transistor Q9 is connected to the resistor R24. The controller I.C1 is connected to the switching transistor Q9. The controller I.C1 outputs a control signal for alarm when the absence of water is sensed. The resistor R21 is connected to
25 the controller I.C1. The switching transistor Q5 is connected

to the resistor R21. The buzzer BUZ is connected to the switching transistor Q5.

Hereinafter, an operation of the device for sensing and alarming absence of water in a home machine for manufacturing
5 soybean milk, watery bean curd, and bean curd according to the present invention will be described.

When a user inputs power to a controller I.C1, the controller I.C1 judges whether or not water is present in the interior of the body 1 in response to a signal inputted from
10 the signal electrode E2 through the resistor R24 and the switching transistor Q9. When the water is present in the interior of the body 1, the ground electrode E1 and the signal electrode E2 are electrically connected to each other by means of the water. Accordingly, a ground electric potential is
15 applied to a base of the switching transistor Q9 to turn off the switching transistor Q9. When the water is absent in the interior of the body 1, the ground electrode E1 and the signal electrode E2 are electrically disconnected from each other. Accordingly, a non-ground electric potential is applied to the
20 base of the switching transistor Q9 to turn on the switching transistor Q9.

The ground electrode E1 and the signal electrode E2 are used in connection to two selected components installed in the body, respectively.

25 FIGS. 3 through 6 show devices having the ground electrode

E1 and the signal electrode E2 which are electrically connected to two selected components in the body 1, respectively, which sense the absence of water in soybean milk, watery bean curd, and bean curd manufacturing apparatus for domestic use and
5 generate an alarm signal indicative of the sensed result according to embodiments of the present invention.

FIG. 3 shows the ground electrode E1 and the signal electrode E2 which are electrically connected to a heater 6 and a shorter driving shaft 3, respectively, according to the first
10 embodiment of the present invention.

FIG. 4 shows the ground electrode E1 and the signal electrode E2 electrically connected to a heater 6 and a filter net, respectively, according to the second embodiment of the present invention.

15 FIG. 5 shows the ground electrode E1 and the signal electrode E2 which are electrically connected to a heater 6 and an inner barrel, respectively, according to the third embodiment of the present invention.

FIG. 6 shows the ground electrode E1 and the signal electrode E2 which are electrically connected to a round bar 8 and a round bar, respectively, according to the fourth
20 embodiment of the present invention.

When the water is absent between the ground electrode E1 and the signal electrode E2, the switching transistor Q9 is
25 turned on. Accordingly, the controller I.C1 drives the

switching transistor Q9 connected to an output terminal of the controller I.C1. The switching transistor Q9 drives and operates the buzzer BUZ to output an alarm sound.

When a user puts beans and water in the interior of the
5 body 1, the controller I.C1 operates a driving motor 2. Then the driving motor 2 controls the knife edge 5 to pulverize the beans and water. The controller I.C1 operates the heater 6 and the temperature sensor 7 to perform a series of processes so that soybean milk, watery bean, and bean curd are sequentially
10 manufactured. The series of processes are processes which heat the beans and water

As mentioned above, the present invention can provides an apparatus for sensing and alarming whether water is present in a machine for manufacturing soybean milk, a watery bean curd,
15 and a bean curd, which allows the home manufacturing machine to be operated only when the home manufacturing machine contains water, so as to prevent the machine from being operated by a user without water, thereby preventing the machine from getting damaged. The present invention can be applied and used in an
20 apparatus field which manufactures soybean milks, watery bean curds, and bean curds, without departing from the scope and spirit of the invention.

Although a preferred embodiment of the present invention has been described for illustrative purposes, those skilled in
25 the art will appreciate that various modifications, additions

and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

WHAT IS CLAIMED IS:

1. A device for sensing and alarming absence of water in an apparatus for manufacturing soybean milk, watery bean curd, and bean curd, the apparatus being in domestic use, the apparatus including a plurality of components installed in a body, the device comprising:

a ground electrode and a signal electrode electrically connected to two selected in the plurality of the components, respectively;

a first resistor connected to the signal electrode;

a first switching transistor connected to the first resistor;

a controller connected to the first switching transistor for outputting a control signal for an alarm when the absence of the water is sensed;

a second resistor connected to the controller;

a second switching transistor connected to the second resistor; and

a buzzer connected to the second switching transistor.

2. The device as claimed in claim 1, wherein the ground electrode and the signal electrode are electrically connected to a heater and a short driving shaft, respectively.

3. The device as claimed in claim 1, wherein the ground electrode and the signal electrode are electrically connected to a heater and a filter net, respectively.

5 4. The device as claimed in claim 1, wherein the ground electrode and the signal electrode are electrically connected to a heater and an inner barrel, respectively.

10 5. The device as claimed in claim 1, wherein the ground electrode and the signal electrode are electrically connected to a first round bar and a second round bar, respectively.