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(54) Title: CONTACTLESS CONTROLLABLE ILLUMINATED CONTROL MECHANISM

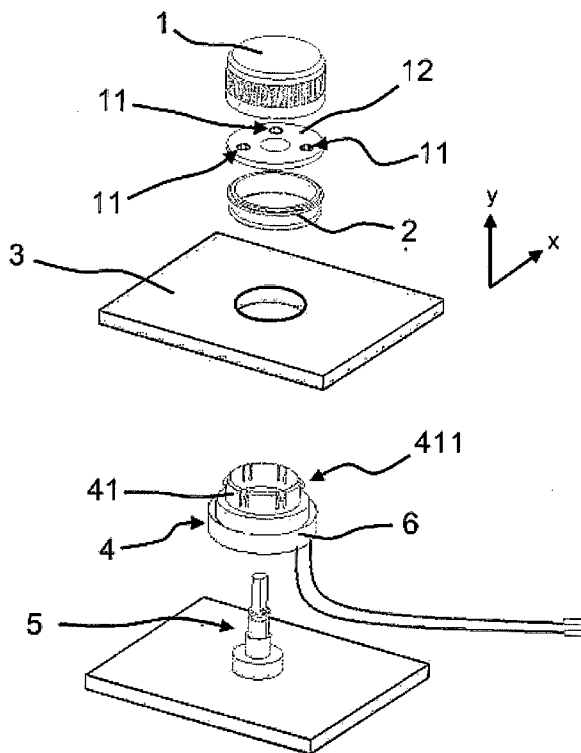


Fig. 1

(57) Abstract: The invention relates to contactless controllable illuminated control mechanisms which are used for igniting the cookers within industrial and domestic gas and electric cookers, and for indicating the gas adjustment level to the user.

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DESCRIPTION

CONTACTLESS CONTROLLABLE ILLUMINATED CONTROL MECHANISM

5 **Technical Field**

The invention relates to contactless controllable illuminated control mechanisms which are used for igniting the cookers within industrial and domestic gas and electric cookers and for indicating the gas adjustment level to the user.

10

State of the Art

Within the state of the art, light quantities of the light indicators are quite low; in other words, they can only be seen in the dark, but not in daylight. Since the
15 number of LEDs used and the current drawn are of 5-10mA levels and the light is transmitted through a filter, light brightness is lost. Moreover, due to the members used in models directly run by 220V, even in cases where the current is 5mA and 1 LED is used, excessive heating occurs. Existing applications cannot emit light homogeneously. The reason for this is that the LEDs, emitting
20 light in appropriate quantity and with appropriate angle, are operated by wrong value of lumen. The fact that the surface utilized is small and narrow also poses a problem in terms of heating.

In current applications, LED light circuits are run by 220V. In order to provide
25 the required power for the operation of LED light circuits, the power is used after being reduced to 12V from 200V by means of an adapter. The use of adapter causes problems in terms of cost and space.

In buttons without light and in the ones controlled with light, upon touching the
30 lighter in ignition position, i.e. moving the lighter downwards, contact occurs with the metal surface and said contact affects ignition. However, physical abrasion

occurs in the meantime. This, in turn, leads to breakdowns and shortens the service life of the button.

5 None of the circuits operating within the state of the art are water resistant. This causes cooker control members to breakdown upon contact with liquid in case of spillage of any liquid in cook top ovens, as well as causing serious damage due to the utilization of electric energy of 220V.

10 In the applications used today which indicates gas level increase by means of light, the light gets out of a single source and interacts with the others. Therefore, the brightness of light level causes problems in terms of perception.

15 Current applications are only manufactured in accordance with the models made by the firms designing the product. The manufactured light buttons are not universal, which causes problems in such cases as replacing the device, etc.

20 In the systems increasing light intensity according to gas, level switch of the button is performed by the friction of the button around its own axis.

As a result, due to the above mentioned drawbacks and the inefficiency of the current solutions, it has become necessary to make a development in the related technical field.

25 **Object of the Invention**

The invention, configured by being inspired from current conditions, aims to solve the above mentioned drawbacks.

30 The object of the invention is to introduce an illuminated control mechanism that has a light source emitting light at equal brightness in 360°, i.e. in every

direction. Thus, it becomes easy for the user to perceive the light no matter where s/he looks at.

Another object of the invention is to make the control circuit providing the brightness of said light cause no further heating apart from that in the state of the art.

Another object of the invention is to eliminate the need for the use of an adapter, and thus provide advantage in terms of cost and space, thanks to the direct use of the electronic components integrated in the system with 220V.

Another object of the invention is to eliminate the friction occurring when the button contacts a metal surface within the state of the art thanks to the use of magnetic sensor within the system, and to perform ignition, on-off mode of the light via magnetic sensor. Hence, no abrasion or corrosion occurs.

Another object of the invention is to make the circuit completely resistant to heat, liquid, moisture and humidity, thanks to the fact that contactless controlled electronic light circuit in the form of a ring is coated with an insulator of transparent chemical, e.g. epoxy.

Another object of the invention is to increase light level of the light sources by making the contactless controlled electronic light circuit in the form of ring read the information on magnetic sensor as the button is rotated, and enable the user to understand which section burns at what level, of these light sources.

Another object of the invention is to be compatible with any kind of taps used in any cooker by being inserted around the tap in ring form, since the contactless controlled illuminated control circuit is configured in ring form. The system comprising illuminated control circuit and button is therefore universal.

Another object of the invention is that the contactless controlled electronic illuminated control circuit is controlled only in two axes (i.e. x and y axes). The reason for this is to eliminate the need for a third axis motion due to the fact that control is made by magnetic sensor and no contact is required.

5

In order to achieve the above mentioned objects, an illuminated control mechanism has been developed which is used in industrial and domestic gas and electric cookers for igniting the cooker and for indicating gas level to the user and which has the characteristic of being contactless controlled, said
10 mechanism comprising magnetic control knob capable of moving rotationally in x axis; at least one, preferably two magnets which is located on said magnetic control button and which can be detected by magnetic positioning sensor; a control circuit on which at least one, preferably two magnetic positioning sensors are located, said sensor detecting said magnets and allowing
15 brightness level of the light sources to change when magnetic control button is rotated; magnetic control button moveable downwards and upwards in y axis; at least one magnet located on said magnetic control button and detectable by magnetic ignition sensor; and another control circuit on which at least one magnetic ignition sensor is located, said sensor detecting the magnet when the
20 magnetic control button moves downwards in y axis, and allowing the gas to be ignited.

The structural and characteristic aspects and all the advantages of the present invention will be more clearly understood by means of following figures and the
25 detailed description written with references to these figures; therefore, while making an evaluation, these figures and the detailed description should be taken into account.

Figures for a Better Understanding of the Invention

30

Fig. 1 is the view of contactless controllable illuminated control button according to the invention, when it is dismantled.

Fig. 2 is the bottom view of the preferred embodiment of the control circuit.

Fig. 3 is the top view of the preferred embodiment of the control circuit.

5 Description of Part References

1. Magnetic control knob
11. Magnet
12. Magnet positioning member
- 10 2. Fixing and sealing member
3. Cooker surface
4. Control circuit
40. Diode bridge
41. Fixing member
- 15 411. Lugs
42. Magnetic positioning sensor
43. Magnetic ignition sensor
44. Light source (LED)
45. Integrated circuit 1
- 20 46. Integrated circuit 2
47. R1 resistor
48. R2 resistor
49. R3 resistor
50. Capacitor
- 25 5. Gas tap
6. Coating material

The drawings are not necessarily to scale and the details that are not necessary to understand the present invention may be ignored. Moreover, the components

30 that are at least substantially identical or that have at least substantially identical functions are referred with the same numeral.

Detailed Description of the Invention

5

In this detailed description, the preferred embodiments of the illuminated control mechanism according to the invention will be explained only for the invention to be better understood.

10 The preferred embodiment of the illuminated control mechanism according to the invention, when it is dismounted, is attached. The illuminated control mechanism comprises, as main components, magnetic control knob (1) and control circuit (4).

15 Mini magnets (11) are provided on magnetic control knob (1). Mini magnets (11) can also be located on magnet positioning member (12) which may be placed in control knob (1) (Fig. 1). The magnets (11) are at least two, preferably three, in number. One magnetic ignition sensor (43) and at least one, preferably two magnetic positioning sensors (42) corresponding to said mini magnets (11) are
20 provided on the control circuit (4). In the position where gas is turned off, magnetic positioning sensors (42) detect mini magnets (11). Similarly, magnetic ignition sensor (43) detects mini magnets (11). Control circuit can be controlled only in two axes (i.e. x and y axes). The reason for this is to eliminate the need for a third axis motion due to the fact that control is made by magnetic sensors
25 (42, 43) and no contact is required. Said control knob (1), as it is rotated, enables the magnets (11) thereon to get near to and away from magnetic positioning sensors (42) on the control circuit (4), and thus serving as a switch allowing the LEDs (44), i.e. light sources (44), to be on and off, or the brightness level to change. When the control button (1) is pushed downwards, the other
30 magnet (11) thereon is permitted to get down to the level to be detected by the magnetic ignition sensor (43). Thus, the gas is ignited.

Control circuit (4) with magnetic sensor is integrated with fixing member (41). Thanks to the lugs (411) formed on the fixing member (41) which is integrated with said control circuit (4), control circuit (4) is fixed to fixing and sealing member (2), and thus to the control button (1) connected to said sealing member (2). Control unit (4) is designed for universal applications. It is easy to mount.

Light sources (44), i.e. LEDs (44), are located on the upper surface of the control circuit (4) and they are preferably three in number. LEDs (44) are three-level, i.e. they provide illumination in three different light levels. LEDs (44) emit light at equal brightness in 360°, i.e. in every direction. Thus, it becomes easy for the user to perceive the light no matter where s/he looks at. The system providing the brightness of the light emitted by said light sources (44) causes no heating, because the components enabling the control circuit (4) to be run by 220V operate by consuming little heat. Moreover, since the LED lights (44) chosen are of SMD (Surface Mount Device) type, they occupy less space and emit bright light even in high current (30-40mA) and they heat negligibly.

Since multilayer capacitor (50) of 275V integrated with control circuit (4), diode bridge (40) of SMD (Surface Mount Device) type (600V) and nickel-chrome coated, wire-wound R1, R2 and R3 resistors (47, 48, 49) can all be used with 220V directly, there is no need for the use of an adapter, thereby providing advantage in terms of cost and space. Said capacitor and resistors are special fabrication.

Coating material (6) is provided on control circuit (4). Said coating material (6) is a transparent, clear material, e.g. epoxy. Coating material (6) reduces light transmittance. Furthermore, it prevents electronic control circuit (4) from being damaged by heat and liquid. It protects the control circuit (4) with magnetic sensor by insulating. Coating material (6) makes the control circuit (4) completely resistant to heat, liquid, moisture and humidity.

Fixing and sealing member (2) is preferably a gasket. Said fixing and sealing member (2) is located inside magnetic control knob (1) and assists in the fixation of the control unit (4) to the control knob (1). Another function of the fixing and sealing member (2) is to provide liquid sealing.

5

Cooker surface (3) is the surface of the front panel on the cooker. Gas tap (5) provides gas flow.

The operating principle of the illuminated control mechanism according to the invention is as follows: The control circuit (4) not only allows light control, but also enables the ignition to be performed. When the control knob (1) is rotated, gas tap (5) is opened and gas flow is directed to the desired section. Flow amount of the gas depends on how much the control knob (1) is rotated. When the control knob (1) is pushed downward in y axis, the magnetic ignition sensor (43), which does not detect the mini magnet (11) in closed position, now detects said magnet (43) and enables the gas to be burned by sending command to the ignition unit by means of integrated circuit 1 (45). During rotation of the control knob (1), the other two of the mini magnets (11) on the control knob (1) get away from magnetic positioning sensors (42) on the control unit (4), with the rotational motion of the control knob (1) in axis x. During this movement, the control circuit (4) changes the brightness of the light sources (44) by means of the integrated circuit 2 (46).

While the gas is burning in any section, the magnetic control knob (1) is rotated in increasing direction or otherwise when it is desired to increase or decrease gas amount. While an increase or decrease in gas flow is achieved with this rotation, at the same time the brightness of the light sources (44) that emit light is also changed. In more detail, the control circuit (4) with magnetic sensor enables the magnetic positioning sensor (42) provided thereon and the magnets (11) provided on said control button (1) to get near to and away from one another, and it also allows the light sources (44) to emit light at different levels. Thus, the user understands the level of gas.

In addition to the embodiments explained above, it is also possible to inform the user by making the light sources (44) emit light in different color. Moreover, as another alternative embodiment, it may be indicated that gas density is decreasing or increasing, by enabling the light sources (44) to light
5 intermittently, i.e. lighting on/off just like blinking.

CLAIMS

1. The invention relates to contactless controllable illuminated control mechanisms which are used for igniting the cookers within industrial and domestic gas and electric cookers, and for indicating the gas adjustment level to the user; characterized in that it comprises:
- 5
- magnetic control knob (1) capable of moving rotationally in x axis,
 - 10 - at least one magnet (11) detectable by magnetic positioning sensor (42),
 - control circuit (4) on which at least one magnetic positioning sensor (42) is located, said sensor detecting said magnet (11) and allowing brightness level of the light sources (44) to change when magnetic control knob (1) is rotated.
 - 15
2. The invention relates to contactless controllable illuminated control mechanisms which are used for igniting the cookers within industrial and domestic gas and electric cookers, and for indicating the gas adjustment level to the user; characterized in that it comprises:
- 20
- magnetic control knob (1) capable of moving upwards and downwards in y axis,
 - 25 - at least one magnet (11) detectable by magnetic ignition sensor (43),
 - control circuit (4) on which at least one magnetic ignition sensor (43) is located, said sensor detecting said magnet (11) when magnetic control knob (1) moves downwards in y axis and allowing the gas to be ignited.
 - 30

3. Illuminated control mechanism according to Claims 1 and 2; characterized in that it comprises:
- 5 - fixing member (41) which is located on said control circuit (4) and which fixes said control circuit (4) to the control knob (1).
4. Illuminated control mechanism according to Claim 3; characterized in that it comprises:
- 10 - lugs (411) which are provided on said fixing member (41) and which enables the fixing member (41) to be fixed on the magnetic control knob (1).
5. Illuminated control mechanism according to any one of the Claims 1 to 4; characterized in that it comprises:
- 15 - control circuit (4) operated with an electric energy of 220V.
6. Illuminated control mechanism according to any one of the Claims 1 to 5; characterized in that it comprises:
- 20 - insulating coating material (6) which is provided on said control circuit (4) and which prevents heat and liquid leakage to said control circuit (4) and provides light transmittance.
- 25
7. Illuminated control mechanism according to Claim 6; characterized in that
- 30 - said coating material (6) is epoxy.
8. Illuminated control mechanism according to any one of the Claims 1 to 7; characterized in that

- said light source (44) is LED.

5 9. Illuminated control mechanism according to Claim 1; characterized in that it comprises:

- integrated circuit 2 (46) which understands that said magnetic positioning sensors (42) detect the magnets (11) on the control knob (1), and then increases or decreases the brightness level of the light sources (44).
- 10

10. Illuminated control mechanism according to Claim 2; characterized in that it comprises:

- integrated circuit 1 (45) which understands that said magnetic ignition sensor (42) detects the magnet (11) on the control knob (1), and then sends command to the ignition unit to ignite the gas.
- 15

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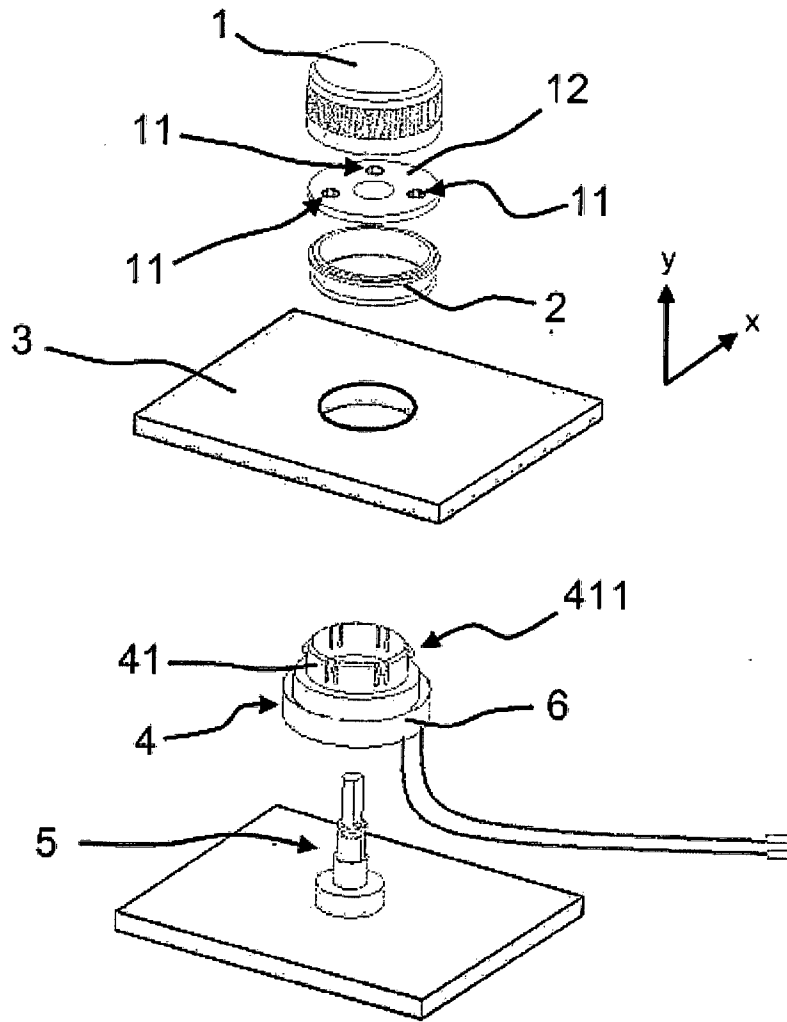


Fig. 1

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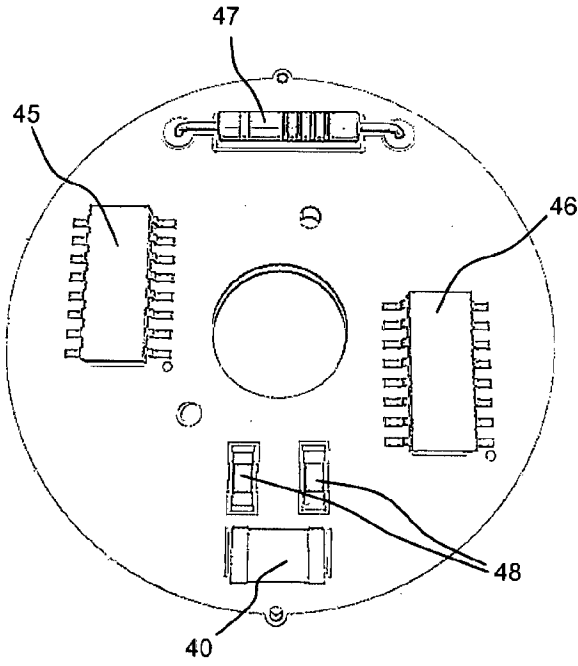


Fig. 2

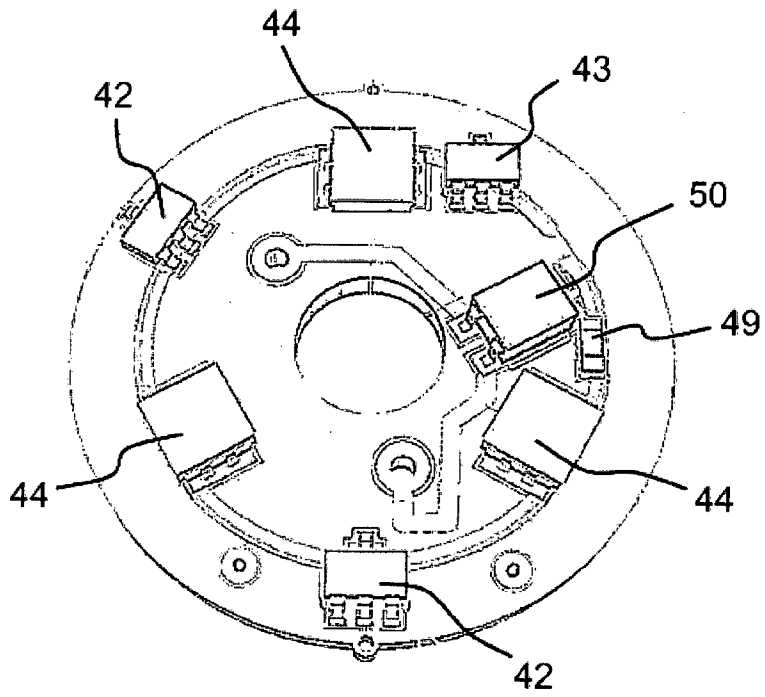


Fig. 3