Disclosed herein is a light emitting melody candle. The light emitting melody candle of the present invention has a sensing means provided around a wick of a candle body to detect whether the candle is lit, so that, when the candle body is lit, a melody is played from a candle stand coupled to the bottom of the candle body. The light emitting melody candle includes a heat conductive wire, which transfers heat of the wick towards the bottom of the candle body when the candle body is lit, and a sensing unit, which is provided in the candle stand and is in contact with the heat conductive wire to detect heat transferred through the heat conductive wire. The light emitting melody candle further includes a light generating means, which generates light when the sensing unit detects heat, a control unit, which is provided in the candle stand to control the light generating means, and a light transmitting means, which is provided between the candle body and the candle stand to evenly transmit light therebetween.
Fig. 3

Prior Art
LIGHT EMITTING MELODY CANDLE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to melody candles and, more particularly, to a light emitting melody candle which has a heat sensing means for detecting whether the candle is lit and has a light transmitting means between a candle body and a candle stand such that light of LEDs (light emitting diodes), which are provided in the candle stand, is readily transmitted to the candle body.

2. Description of the Related Art

As well known to those skilled in the art, in a conventional decorative melody candle, a wick and an optical fiber are provided through the longitudinal central portion of a candle body. When the wick is lit, the wick and the optical fiber are burned together, and an optical signal is transmitted through the optical fiber to a melody playing device, which is installed in a candle stand coupled to the bottom end of the candle body. Thus, the melody playing device, which receives the optical signal, plays a melody.

However, in the case of the conventional decorative melody candle, even if a flame, which has burned the wick and the optical fiber, is put out, in order to stop the operation of the melody candle, the melody may still play due to outside light such as sunlight or lamplight transmitted through the transparent optical fiber. Furthermore, candle wax, melted and liquefied around the fire, and the optical fiber or wick, which is burnt black, may impede the transmission of light, so that the melody is interrupted and restarts from the beginning, thus inconveniencing a user, and deteriorating the marketability.

In an effort to overcome the above-mentioned problems, a decorative melody candle that prevents a melody from undesirably playing even after the fire is put out and having a function such that the user does not easily become tired of the melody candle, was proposed. As shown in FIGS. 1 through 3, this decorative melody candle of the prior art includes a candle stand 10, a candle body 20, a push member 40, and a melody playing device 30. The candle stand 10 has a coupling seat 11 in an upper surface thereof. Connection protrusions 14 and 14', which communicate with each other, respectively extend upwards and downwards from the center of the upper surface of the candle stand 10. Communication holes 15 are formed through the upper surface of the candle stand 10 around the connection protrusions 14 and 14'. An optical fiber 22 and a wick 21 are longitudinally inserted through the central portion of the candle body 20. The push member 40 is coupled to the lower end of the candle body 20. A through hole 41, through which the lower end of the optical fiber 22, exposed outside the lower end of the candle body 20, is inserted into the connection protrusion 14, is formed through the center of the push member 40. A hollow receiving part 42, which protrudes upwards, is provided on the push member 40 around the through hole 41. The melody playing device 30 is installed in the candle stand 10. The melody playing device 30 includes an optical sensor 31, which is fitted into the connection protrusion 14 and faces the lower end of the optical fiber 22 inserted into the connection protrusion 14', and a melody selection switch 32, which has a push knob 32a that is exposed outside the upper surface of the candle stand 10 through the communication hole 15 and is selectively coupled to the receiving part 42 of the push member 40. The melody playing device 30 further includes a melody IC, which stores various melodies, and a speaker 33. In the drawings, reference numeral 12 denotes support legs, 13 denotes a cover plate, 131 denotes through holes, 301 denotes a battery case, and 32 denotes a switch. As shown in FIG. 3, a control unit 10 recognizes a signal from the switch 32, which serves as input switches SW1, SW2 and SW3 of the control unit 10, and outputs the signal to a speaker 33 through an output transistor TR2. When the candle 20 is lit, a transistor TR1 is turned on by the optical sensor 31, such as a photocoupler, which detects light through the optical fiber. At this time, the control unit 10 recognizes this.

This melody candle is able to play various melodies but is not distinguished from the prior art, so that the problem of interruption of a melody still remains.

SUMMARY OF THE INVENTION

Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art, and an object of the present invention is to provide a light emitting melody candle, which senses heat generated when the candle is lit, thus preventing a malfunction due to outside light, such as sunlight and lamplight, and preventing the interruption of a melody, and which can play various melodies stored in a CD (compact disk) or the like, thus selectively providing various moods to a user, unlike the conventional art, which plays only pre-stored melodies.

Another object of the present invention is to provide a light emitting melody candle, in which a light emitting means is provided in a candle stand and a light transmitting groove is formed in the bottom of a candle body, so that the light transmitting means is protected by the light transmitting groove and the light of the light emitting means can be evenly transmitted to the surface of the candle body.

A further object of the present invention is to provide a light emitting melody candle, in which a light transmitting plate is provided on the bottom of the candle body to ensure thermal insulation and light transmissibility.

To accomplish this, in the present invention, a light transmitting groove having a ring shape is formed in the bottom of the candle body, and LEDs are provided in and exposed outside a coupling seat of the candle stand, into which the candle body is placed, so that light from the LEDs can be evenly diffused outside through the candle body.

In order to accomplish the above objects, the present invention provides a light emitting melody candle, having a sensing means provided around the wick of a candle body to detect whether the candle is lit so that, when the candle body is lit, a melody plays from a candle stand coupled to the bottom of the candle body. The light emitting melody candle includes: a heat conductive wire to transfer heat from the wick towards the bottom of the candle body when the candle body is lit; a sensing unit provided in the candle stand and in contact with the heat conductive wire to detect heat transferred through the heat conductive wire; a light generating means to generate light when the sensing
unit detects heat; a control unit provided in the candle stand to control the light generating means; and a light transmitting means provided between the candle body and the candle stand to evenly transmit light therethrough.

0013 Preferably, a light transmitting plate, which has a ring-shaped groove corresponding to the light transmitting groove, may be provided on the bottom of the candle body.

0014 Furthermore, a control output terminal of the control unit may be connected to a CD (compact disk) player, which is operated through a relay and generates sound from a sound source.

BRIEF DESCRIPTION OF THE DRAWINGS

0015 The above and other objects, features and advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

0016 FIG. 1 is an exploded perspective view of a conventional melody candle;

0017 FIG. 2 is a cross-sectional view showing the assembled melody candle of FIG. 1;

0018 FIG. 3 is a control circuit diagram of the melody candle of FIG. 1;

0019 FIG. 4 is an exploded perspective view of a light emitting melody candle, according to an embodiment of the present invention;

0020 FIG. 5 is a sectional view showing the light emitting melody candle of FIG. 4; and

0021 FIG. 6 is a block diagram of the light emitting melody candle of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

0022 Hereinafter, a preferred embodiment of the present invention will be described in detail with reference to the attached drawings.

0023 The present invention provides a light emitting melody candle, a wick 21 of which has a sensing means for detecting whether the wick 21 is lit so that, when the candle is lit, a candle stand 10 plays a melody. The light emitting melody candle according to the embodiment of the present invention includes a heat conductive wire 52 to transfer the heat of the wick 21 towards the bottom of a candle body 20 when the candle is lit. A sensing unit 60 is provided in the candle stand 10, and the sensing unit 60 contacts the heat conductive wire 52 to detect heat transferred through the heat conductive wire 52. A control unit is also provided in the candle stand 10 to control LEDs (light emitting diodes) 71, 72, 73 having three primary colors, and the control unit operates to turn on the LEDs 71, 72, 73 when the sensing unit 60 detects heat.

0024 At least three LEDs 71, 72 and 73 are disposed in a candle coupling seat 74 of the candle stand 10 at positions defining a circle. A light transmitting groove 53 having a ring shape is formed in the bottom of the candle body 20 at a position corresponding to the LEDs 71, 72 and 73 such that the light of the LEDs 71, 72, 73 is diffused through the light transmitting groove 53.

0025 Preferably, a light transmitting plate 50 made of a heat insulating material is provided under the bottom of the candle body 20, and the light transmitting plate 50 has a ring-shaped groove 51 that corresponds to the light transmitting groove 53.

0026 FIG. 6 is a block diagram of the light emitting melody candle of the present invention. The present invention includes the control unit 77, which recognizes a sensed value from the sensing unit 60 and operates the LEDs 71, 72, 73 and a relay (Ry) for driving a drive unit 78 in response to the sensed value, and a button unit 79, through which a control command is input to the control unit 77. The LEDs 71, 72, 73 are respectively connected to output terminals P1, P2 and P3 of the control unit 77, so that the control unit 77 individually controls the LEDs 71, 72, 73. The relay (Ry), which is controlled by the control unit 77 through an output terminal P4, applies power to the drive unit 78 when it is turned on, such that a sound source of the drive unit 78 is output to a speaker 76.

0027 For example, a CD player or an MP3 player, which outputs a pre-stored sound source, may be used as the drive unit 78. Thus, the present invention can play various kinds of music corresponding to the individual taste of a user while the candle is lit. Unlike the conventional art, which can play only one pre-stored melody, therefore, the light emitting melody candle of the present invention can provide various moods to the user.

0028 In the light emitting melody candle of the present invention having the above-mentioned construction, as shown in FIG. 4, the candle body 20 is fitted into the coupling seat 74 of the candle stand 10, and the wick 21 of the candle is lit. Then, heat is transmitted to the sensing unit 60 through the heat conductive wire 52, which is provided in the wick 21. The heat conductive wire is made of a material having superior heat conductively including but not limited to aluminum, copper, and graphite. The sensing unit 60 may be a bimetal type or a thermostat type, the resistance of which varies depending on the temperature, and as this is a well-known technique, a detailed description and illustration of the sensor is deemed unnecessary.

0029 The sensed value output from the sensing unit 60 is transmitted to the control unit 77 through an input terminal 11 thereof. The output of the control unit 77 operates the relay (Ry) through the output terminal P4. When the relay (Ry) is operated, power is applied to the drive unit 78 through the relay (Ry), which enters the state of being connected by magnetization, so that a pre-stored sound message of the drive unit 78 is output to the speaker 76. Here, a sound (signal) storage IC chip, a sound storage medium (an MP3 player), which stores a separate sound source, or a sound source player, which plays a CD or tape, may be used as the drive unit 78.

0030 When the sensing unit 60 detects that the candle is lit, the control unit 77 applies drive power to the LEDs 71, 72, 73 through the output terminals P1, P2 and P3. For example, if the LEDs 71, 72, 73 respectively are red, green and blue, the control unit 77 can perform control such that the LEDs 71, 72, 73 express many colors through a method of turning them on in various combinations. Of course, when they are all turned on at the same time, white color is expressed. Furthermore, in the present invention, as shown in FIGS. 4 and 5, because the ends of the LEDs 71, 72, 73...
are exposed outside the bottom of the coupling seat 74, and because the ring-shaped light transmitting groove 53 is formed in the bottom of the candle body 20, when the LEDs 71, 72, 73 are turned on, light is diffused, reflected or totally reflected through the ring-shaped light transmitting groove 53. Thus, light can be evenly transmitted to the surface of the candle body 20.

[0031] Furthermore, in the present invention, as shown in FIG. 4, a light transmitting plate 50 may be additionally provided. In detail, the light transmitting plate 50, which is fastened to the bottom of the candle body 20, is transparent and has a thermal insulation function (like transparent fiberglass), and includes a ring groove 51 corresponding to the light transmitting groove 53. Thus, light can be evenly transmitted from the LEDs 71, 72, 73 into the candle body 20 through the ring groove 51. Therefore, various colors of delicate light can be radiated outside through the candle body 20. Here, the shape of the ring groove 51 corresponding to the light transmitting groove 53 may be variously changed. Furthermore, the number of LEDs 71, 72, 73 may be changed.

[0032] Meanwhile, if the present invention is designed such that the drive unit 78 comprises a CD player, when the candle is lit, the sensing unit 60 detects heat, so that the control unit 77 is driven. An output of the control unit 77, which is transmitted through the output terminal P4, drives the relay (Ry), thus applying power to the drive unit 78. Here, the application of power to the drive unit 78 means that the CD player is automatically operated. In other words, after the user has set desired melodies in the CD player, when the wick 21 of the candle body 20 is lit, the sensing unit 60 detects generated heat and transmits a signal to the control unit 77, so that the control unit 77 sends control output to the output terminal P4. Then, the drive unit 78 is turned on by the turning-on operation of the relay (Ry), which has a contact point structure and repeats turning-on and turning-off in a toggle switching manner, and the drive unit 78 maintains the turned-on state until a further command is transmitted through the control output P4. Therefore, after the sensing unit detects that the user lights the candle, melodies can be continuously played through the drive unit 78 without experiencing the problem with the conventional melody candle, in which a melody is interrupted and restarts from the beginning. As such, there is no probability of malfunction, and the present invention can play a melody without interruption in order to maintain the particular mood created by the melody candle.

[0033] To stop the drive unit 78, the well-known technique in which power is interrupted by removal of the candle body 20, may be used, or, alternatively, one button of the button unit 79 is set such that it conducts a function of turning off power. When power is turned off through the above-mentioned method, the control unit 77 recognizes this and operates the relay (Ry) through the output terminal P4 such that the contact point is turned off in a toggle manner, thus interrupting power, which has been applied to the drive unit 78.

[0034] As described above, in the light emitting melody candle of the present invention, a heat detecting sensor unit is provided, and a light transmitting means is provided between a candle stand and a candle body; thus solving problems with the conventional melody candle, in which there is a probability of malfunction due to outside light entering the candle and in which a melody is interrupted and restarts from beginning. Furthermore, when the candle body is seated on the candle stand, the light of LEDs, which are provided in the candle stand, is transmitted into the candle body through a light transmitting groove, which is a light transmitting means provided in the bottom of the candle body, so that light is evenly diffused outside.

[0035] In addition, a light transmitting plate, which has a thermal insulation function and includes a ring groove, is additionally provided under the bottom of the candle body, and the LEDs are provided in the candle stand. The light from the LEDs is transmitted into the candle body through the ring groove and a light transmitting groove, which is formed in the bottom of the candle body, so that light is diffused outside at an even illumination intensity.

[0036] As well, in the present invention, because the light transmitting plate has the thermal insulation function, even when the candle is almost completely used, the candle stand is prevented from being damaged by heat, and the flame of candle is prevented from igniting the support surface for the candle. Furthermore, because the light transmitting plate has the ring groove corresponding to the light transmitting groove and is transparent such that light can be readily transmitted, superior stability and light transmissibility are ensured.

[0037] Moreover, the present invention includes three primary colors of LEDs, and the LEDs are disposed in the candle stand so that the candle body can alone be replaced with a new one without requiring replacement of the candle stand. Therefore, the present invention can provide a light emitting melody candle that can be used for a long period and express various colors.

[0038] Although the preferred embodiment of the present invention has been disclosed for illustrative purposes, those skilled in 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 light emitting melody candle, having a sensing means provided around a wick of a candle body to detect whether the candle is lit so that, when the candle body is lit, a melody is played from a candle stand coupled to a bottom of the candle body, the light emitting melody candle comprising:
   a heat conductive wire disposed in the candle body, said wire forming to transfer heat of the wick towards a bottom of the candle body when the wick is lit;
   a sensing unit is provided in the candle stand in contact with the heat conductive wire to detect heat transferred through the heat conductive wire;
   one or more light generating members disposed on the candle stand below the candle body;
   a control unit provided in the candle stand operatively connected to said one or more light generating members and sensing unit; and,
   wherein said control unit operates to turn said one or more light generating members on when the sensing unit detects heat.
2. The light emitting melody candle as set forth in claim 1, wherein
the light generating members are light emitting diodes corresponding to different predetermined primary colors.

3. The light emitting melody candle as set forth in claim 1 further comprising a ring-shaped light transmitting groove formed in the bottom of the candle body at predetermined positions corresponding to the light generating members so that light generated by the light generating members is diffused through the light transmitting groove.

4. The light emitting melody candle as set forth in claim 3 further comprising a light transmitting plate provided on the bottom of the candle body, said plate having a ring-shaped groove corresponding to the light transmitting groove, said light transmitting plate is made of a thermal insulating material.

5. The light emitting melody candle as set forth in claim 1, wherein said control unit has a control output terminal operatively connected to a drive unit through a relay; said drive unit is a sound generating unit.

6. The light emitting melody candle as set forth in claim 5 wherein said drive unit is a compact disk player.

7. The light emitting melody candle as set forth in claim 5 wherein said drive unit is a MP3 player.

8. In a candle having a candle body coupled to candle stand with a wick extending through the candle body, the improvement comprising:
    a heat conductive wire disposed in the candle body, said wire formed to transfer heat of the wick towards a bottom of the candle body when the wick is lit;
    a sensing unit is provided in the candle stand in contact with the heat conductive wire to detect heat transferred through the heat conductive wire;
    one or more light generating members disposed on the candle stand below the candle body;
    a control unit provided in the candle stand operatively connected to said one or more light generating members and sensing unit;
    said control unit has a control output terminal operatively connected to a drive unit through a relay; said drive unit is a sound generating unit; and,
    wherein said control unit operates to turn said one or more light generating members on when the sensing unit detects heat.

9. The candle as set forth in claim 8, wherein
the light generating members are light emitting diodes corresponding to different predetermined primary colors.

10. The candle as set forth in claim 8 further comprising a ring-shaped light transmitting groove formed in the bottom of the candle body at predetermined positions corresponding to the light generating members so that light generated by the light generating members is diffused through the light transmitting groove.

11. The candle as set forth in claim 10 further comprising a light transmitting plate provided on the bottom of the candle body, said plate having a ring-shaped groove corresponding to the light transmitting groove, said light transmitting plate is made of a thermal insulating material.

12. The light emitting melody candle as set forth in claim 11 wherein said drive unit is a MP3 player.

13. The light emitting melody candle as set forth in claim 12 wherein said drive unit is a MP3 player.

14. In a candle having a candle body coupled to candle stand with a wick extending through the candle body, the improvement comprising:
a heat conductive wire disposed in the candle body, said wire formed to transfer heat of the wick towards a bottom of the candle body when the wick is lit;
a sensing unit is provided in the candle stand in contact with the heat conductive wire to detect heat transferred through the heat conductive wire;
at least three light generating members disposed on the candle stand below the candle body;
a ring-shaped light transmitting groove formed in the bottom of the candle body at predetermined positions corresponding to the light generating members so that light generated by the light generating members is diffused through the light transmitting groove;
a control unit provided in the candle stand operatively connected to said one or more light generating members and sensing unit;
said control unit has a control output terminal operatively connected to a drive unit through a relay; said drive unit is a sound generating unit; and,
wherein said control unit operates to turn said one or more light generating members on when the sensing unit detects heat.

15. The candle as set forth in claim 14, wherein
the light generating members are light emitting diodes corresponding to different predetermined primary colors.

16. The candle as set forth in claim 15 further comprising
17. The candle as set forth in claim 14 further comprising
18. The light emitting melody candle as set forth in claim 14 wherein said drive unit is a MP3 player.
19. The light emitting melody candle as set forth in claim 14 wherein said drive unit is a MP3 player.