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(54) **ELECTRONIC CANDLE WITH LASER ENGRAVED FIGURES**

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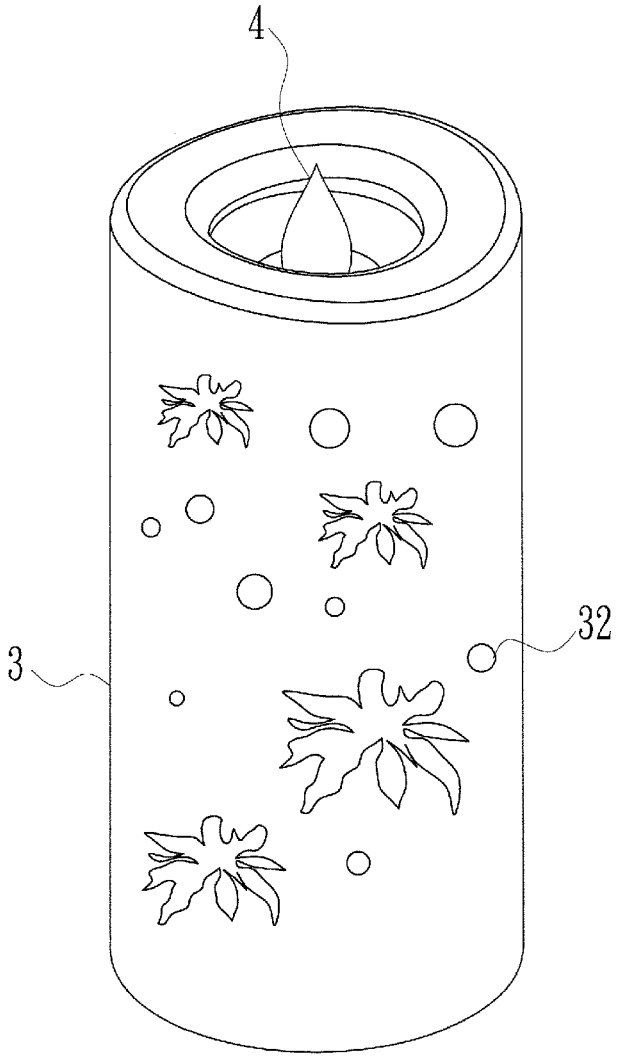
(57) **ABSTRACT**

The present invention provides an electronic candle with laser engraved figures comprising a main base having a power supply unit provided to receive a battery therein and electrically connected thereto to generate a power; a lighting unit provided on a top portion of the main base and electrically connected to the power supply unit of the main base; and a housing made of a plastic material in a transparent hollow tubular shape and comprising an opening on one end thereof and an engraved figure surface formed by laser engraving on a housing wall thereof; and wherein the housing covers an outer circumference of the lighting unit and is attached to the main base. Therefore, as the light generated by the lighting unit passes through the housing, the engraved figure surface of the housing is able to advantageously produce a unique visual effect with rich and layered designs of lighting.



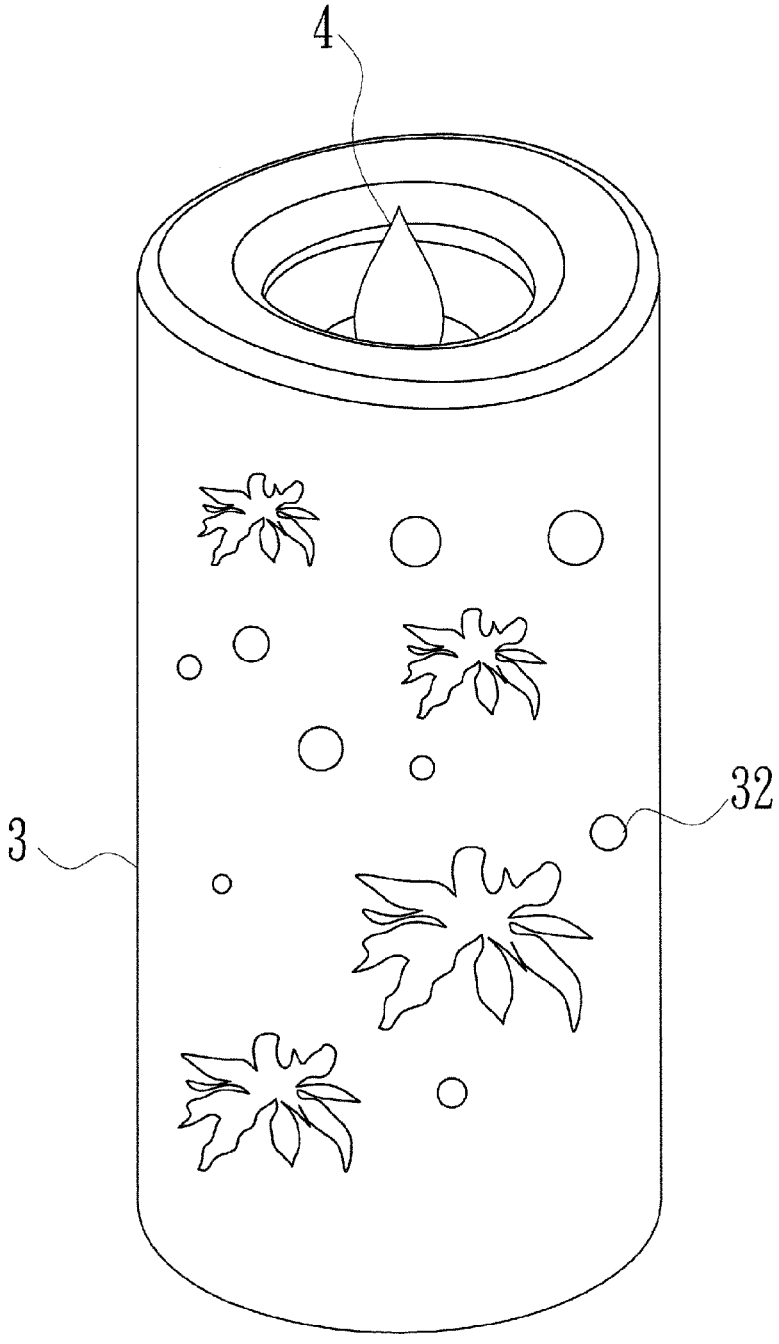


FIG.1

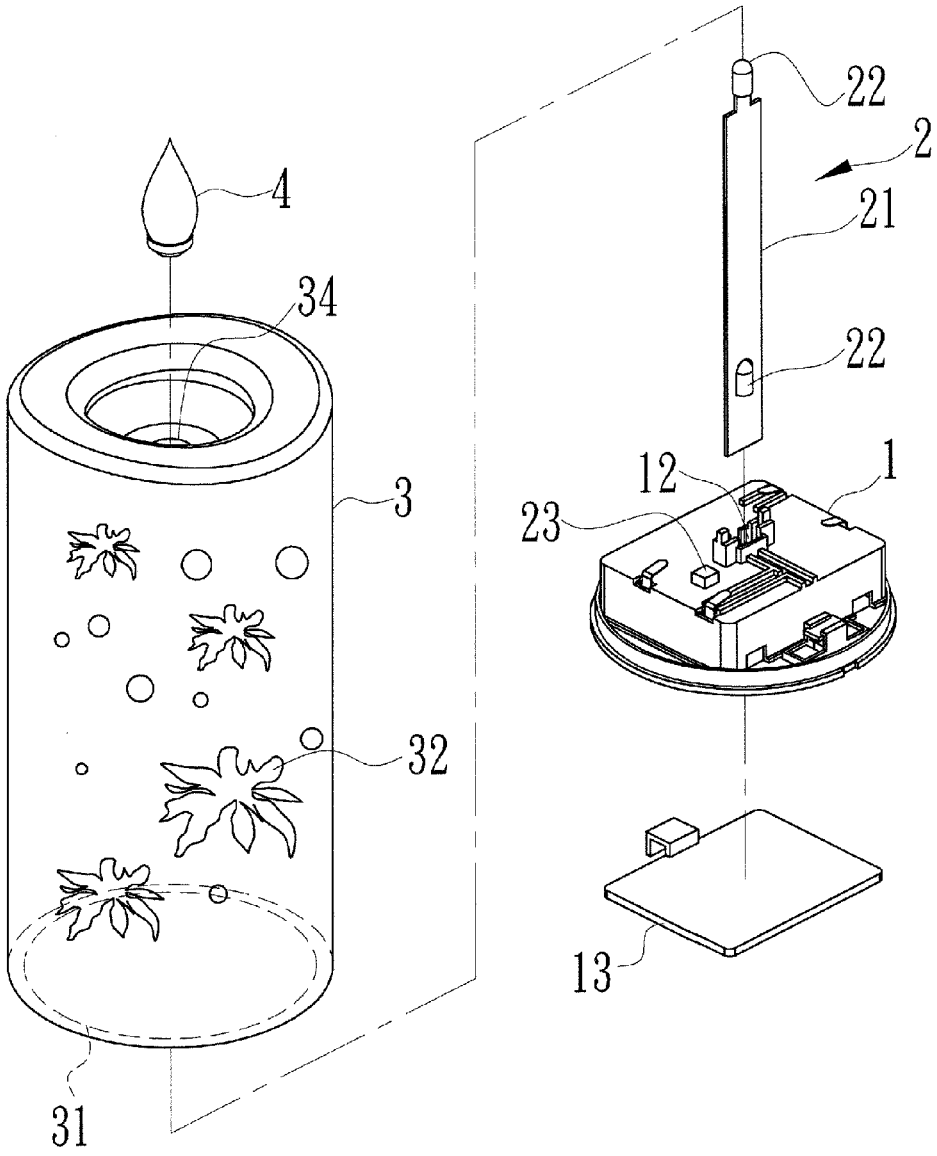


FIG.2

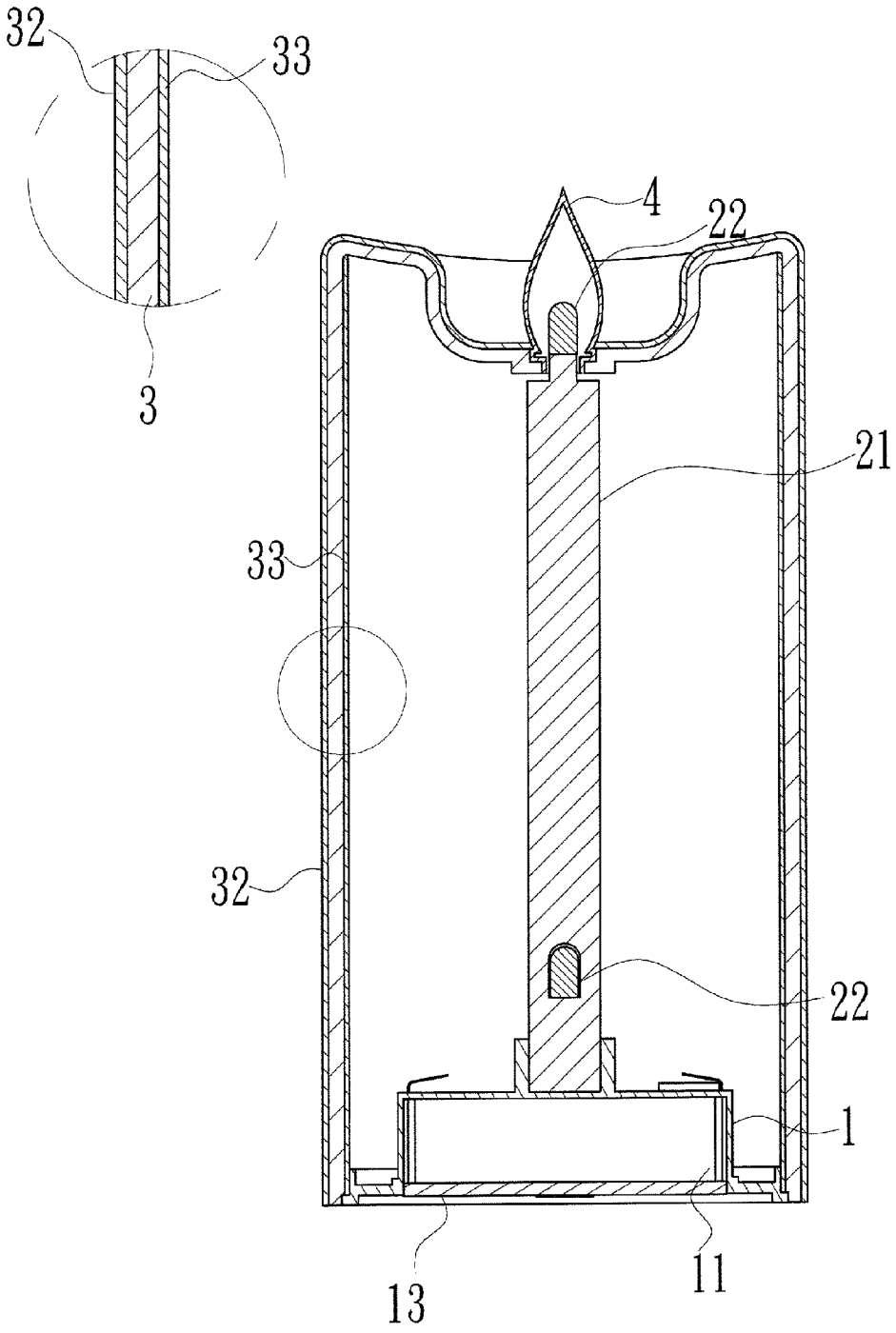


FIG.3

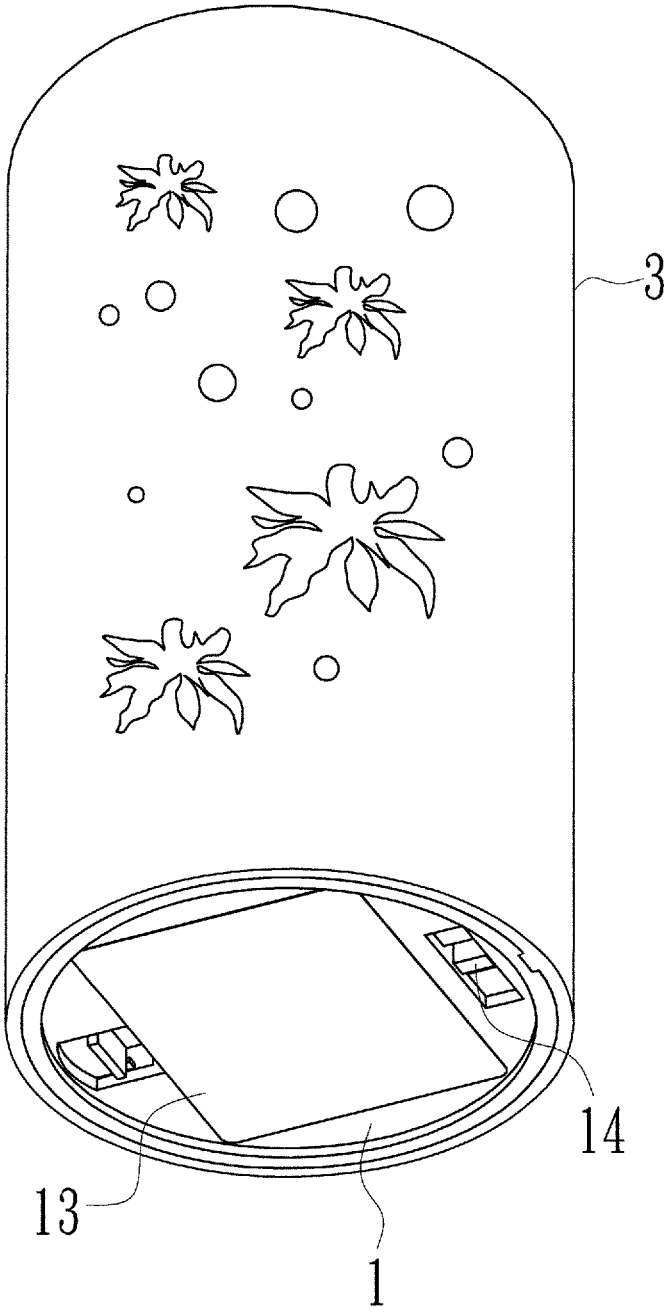


FIG.4

ELECTRONIC CANDLE WITH LASER ENGRAVED FIGURES

(a) TECHNICAL FIELD OF THE INVENTION

[0001] The present invention is related to a candle type decorative apparatus, in particular, to a decorative lighting apparatus with laser engraved figures.

(b) DESCRIPTION OF THE PRIOR ART

[0002] As modern lights and lighting fixtures continues to evolve and develop, the traditional lighting of candles nowadays is being used for decoration purposes in such as special occasions or events while the appearances of candles have always been of column shapes without significant variations.

[0003] For traditional candles, the candle flame is known to be affected by its surrounding air and wind once lit, which is a concern to users as such flickering of candle flames in windy environment may either be blown off or may cause tipping off of the candle causing the hot candle wax to spill, leading to the occurrence of fire hazards or other dangerous accidents. There are now electronic candles introduced to the market for lighting and decorative purposes; nevertheless, the illumination provided by and the figures appeared on the outer shapes of such known electronic candles are in sufficient in terms of their visual and lighting effects. There is a need for an improved electronic candle capable of generating a light with great visual effects and desired illumination effects.

SUMMARY OF THE INVENTION

[0004] Accordingly, the present invention provides an electronic candle with laser engraved figures comprising:

[0005] a main base having a power supply unit provided to receive a battery therein and electrically connected thereto to generate a power;

[0006] a lighting unit provided on a top portion of the main base and electrically connected to the power supply unit of the main base; and

[0007] a housing made of a plastic material in a transparent hollow tubular shape and comprising an opening on one end thereof and an engraved figure surface formed by laser engraving on a housing wall thereof; and wherein the housing covers an outer circumference of the lighting unit and is attached to the main base. Therefore, as the light generated by the lighting unit passes through the housing, the engraved figure surface of the housing is able to advantageously produce a unique visual effect with rich and layered designs of lighting.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a perspective view of the present invention;

[0009] FIG. **2** is an exploded view of the present invention;

[0010] FIG. **3** is a lateral cross sectional view of the present invention; and

[0011] FIG. **4** is a bottom perspective view of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0012] Please refer to FIG. **1** to FIG. **3**, showing a preferred embodiment of an electronic candle with laser engraved figures of the present invention. As shown in the figure, the electronic candle with laser engraved figures of the present invention comprises:

[0013] a main base **1** having a power supply unit **11** provided to receive a battery therein and electrically connected thereto to generate a power; wherein a top portion of the main base **1** comprises a securement slot **12** and a bottom cap **13** attached to a bottom portion of the main base **1**;

[0014] a lighting unit **2** comprising a circuit board **21** inserted into the securement slot **12** and electrically connected to the power supply **11**; wherein the circuit board **21** comprises at least one lighting element **22** electrically connected thereto;

[0015] a housing **3** made of a plastic material in a transparent hollow tubular shape; wherein the housing **3** comprises an opening **31** on one end thereof and an engraved figure surface **32** formed by laser engraving on a housing wall thereof; and wherein the housing **3** covers an outer circumference of the lighting unit **2** and is attached to the main base **1**.

[0016] As shown in FIG. **4**, in an embodiment of the present invention, the main base **1** further comprises a switch **14** having one end electrically connected to the power supply unit **11** and another end electrically connected to the circuit board **21**. The switch **14** is used for controlling on and off states of the lighting elements **22** of the lighting unit **2**. The top portion of the housing **3** comprises a through-hole **34**, and two lighting elements **22** spaced apart from each other are electrically connected to the circuit board **21**; wherein one of the lighting elements **22** is provided on a top of the circuit board **21** and is partially exposed from the through-hole **34**. The through-hole **34** is configured to receive a light shield **4** arranged thereon; wherein the light shield **4** is of a hollow shape of a candle flame. In this embodiment, the two lighting elements **22** are color LED lights and the lighting unit **2** further comprises an integrated circuit board **22** for controlling a color changing sequence and an illumination time of the LED lights such that the two lighting elements **22** emit lights to shine toward the engraved figure surface **32** and then to pass through the housing **3** in order to generate an atmospheric lighting for decorative purposes.

[0017] The engraved figure surface **32** can be provided on either an inner side or outer side of the housing wall of the housing **3**. The figures can be formed by a method of vacuum plating or coating to coat an inner layer thereon, followed by laser engraving to cut out areas of desired figures in order to form hollow and figure zones that are transparent to other inner layers and capable of allowing light to pass therethrough and such that the engraved figure surface **32** is formed; furthermore, the inner layer may also comprise a color layer covered thereon in order to provide a rich visual presentation. In addition, when the engraved figure surface **32** is provided on an outer side of the housing wall, the inner side of the housing wall can be provided with a light-transmissive decorative layer **33** covered thereon; wherein the light-transmissive decorative layer **33** can a layer formed by transparent gel mixed with light-reflective slats or particles or can be formed by surface sand-blasting or frosting treatment methods in order to advantageously achieve a unique visual effect with rich and layered designs and an active illumination.

[0018] The term of "laser engraving" refers to, but not limited to, a process of engraving with a laser light shone on a surface of a target object. Based on the power of the laser and the density of the laser light used, various effects and engraving outcomes can be achieved. The laser engraving can

also be used to atomize a coating or plating surface of a target object such that the original or base color of the object can be revealed.

What is claimed is:

1. An electronic candle with laser engraved figures, comprising:

a main base having a power supply unit provided to receive a battery therein and electrically connected thereto to generate a power;

a lighting unit provided on a top portion of said main base and electrically connected to said power supply unit of said main base; and

a housing made of a plastic material in a transparent hollow tubular shape and comprising an opening on one end thereof and an engraved figure surface formed by laser engraving on a housing wall thereof; and wherein said housing covers an outer circumference of said lighting unit and is attached to said main base.

2. The electronic candle with laser engraved figures according to claim **1**, wherein said lighting unit comprises a circuit board electrically connected to at least one lighting element; and said circuit board is electrically connected to said power supply unit.

3. The electronic candle with laser engraved figures according to claim **1**, wherein said top portion of said housing comprises a through-hole for receiving a light shield arranged thereon.

4. The electronic candle with laser engraved figures according to claim **1**, wherein said engraved figure surface is provided on an outer side of said housing wall of said housing.

5. The electronic candle with laser engraved figures according to claim **4**, wherein an inner side of said housing wall of said housing comprising a light-transmissive decorative layer covered thereon.

6. The electronic candle with laser engraved figures according to claim **1**, wherein said engraved figure surface is provided on an inner side of said housing wall of said housing.

7. The electronic candle with laser engraved figures according to claim **1**, wherein said main base comprises a switch having one end electrically connected to said power supply unit to control on and off states of said lighting unit.

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