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(54) **ELECTRONIC CONTROL OF A WICK CONTAINING FLAMING ENTITY**

**Related U.S. Application Data**

(76) Inventors: **Daniel J. Masterson**, Geneva, IL (US); **Dennis Gruber**, Arlington Heights, IL (US)

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Correspondence Address:  
**MICHAEL BERNS**  
**MALONEY, PARKINSON AND BERNS**  
135 W MAIN STREET  
URBANA, IL 61801 (US)

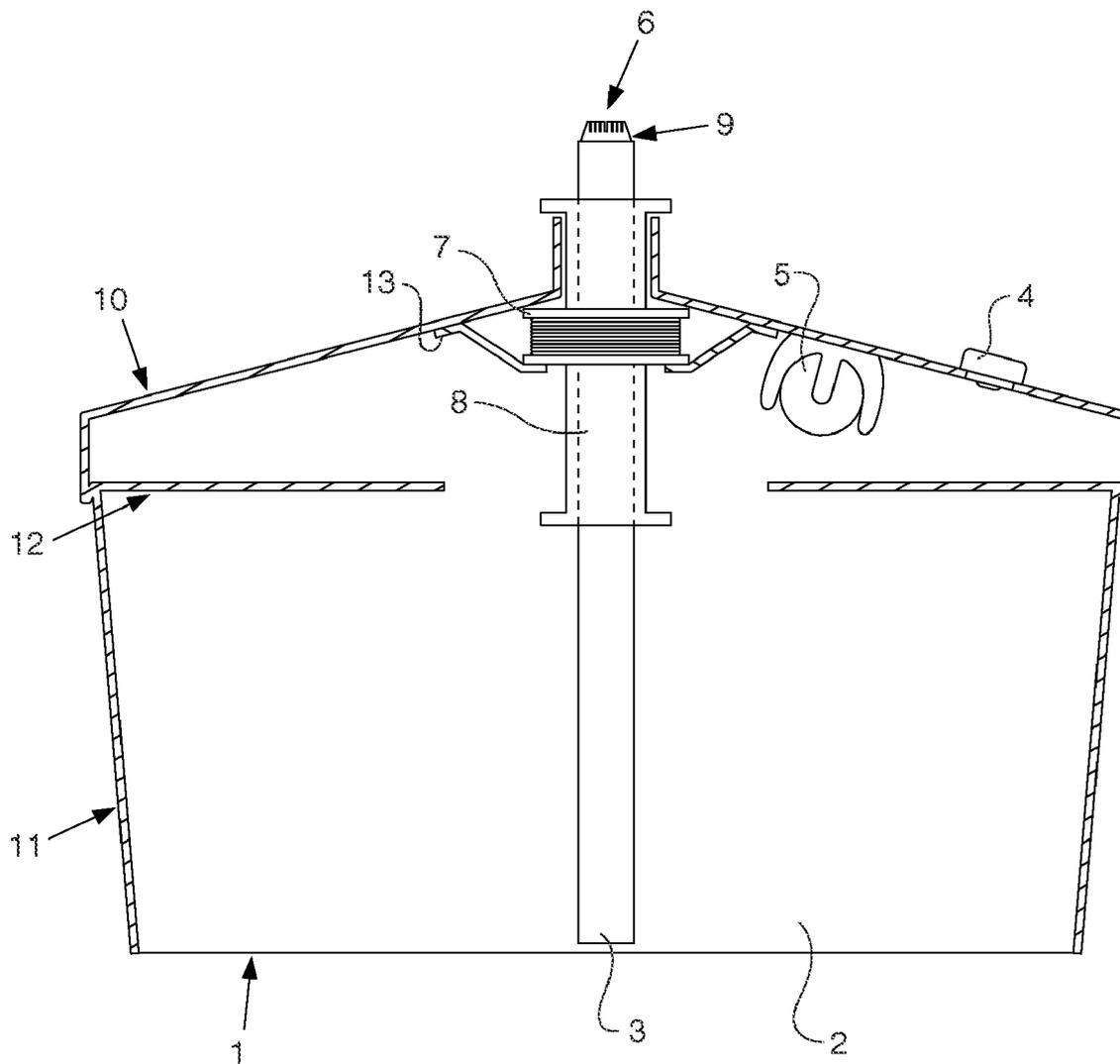
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(57) **ABSTRACT**

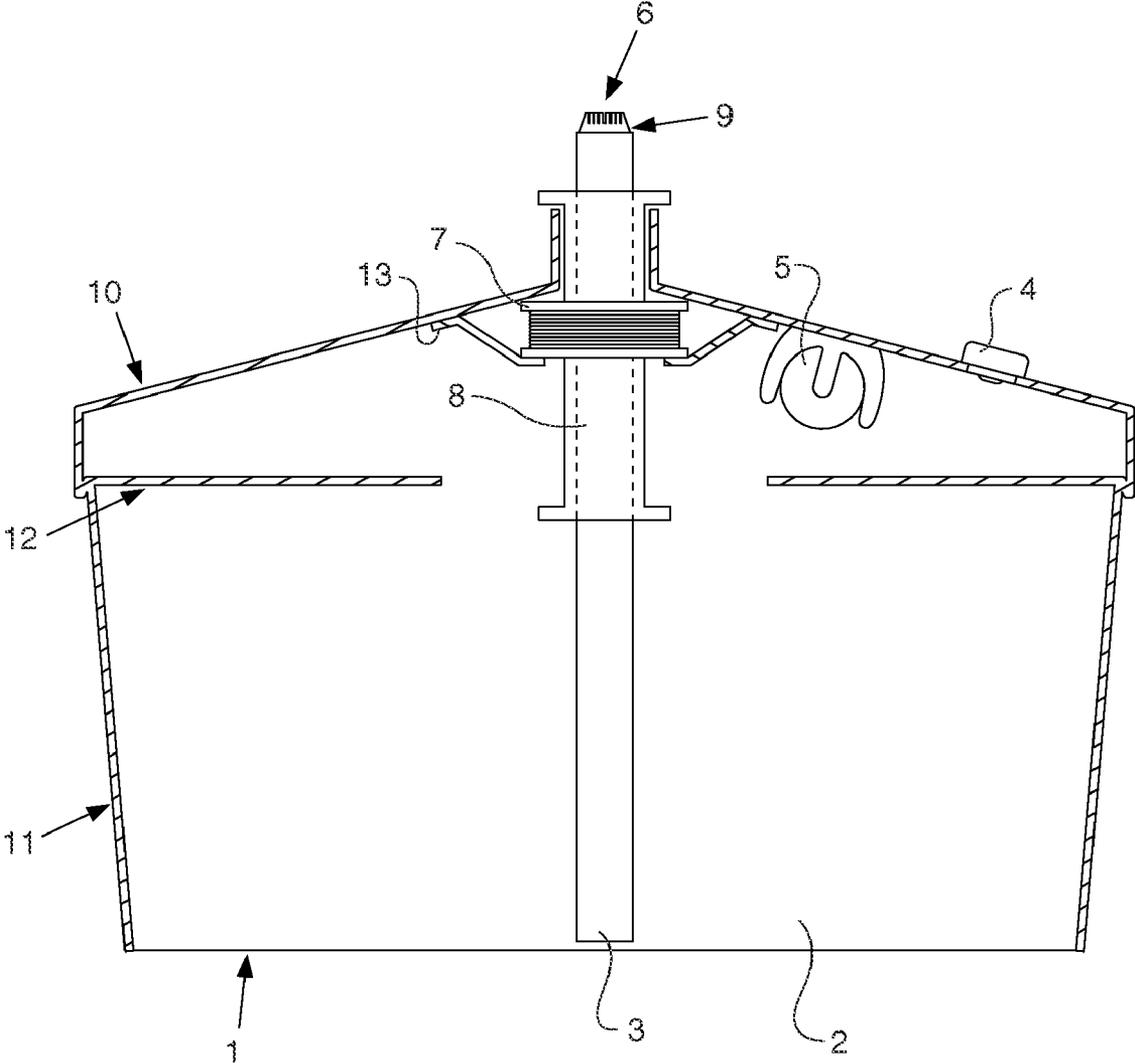
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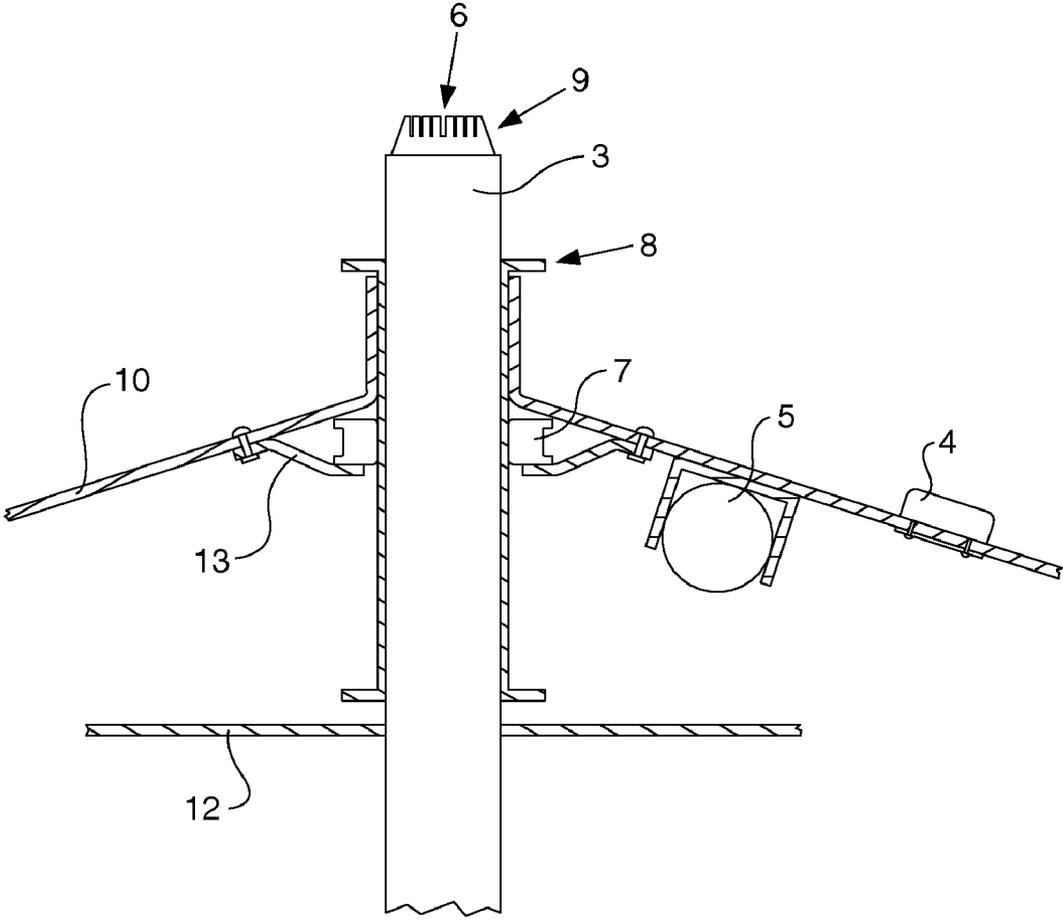
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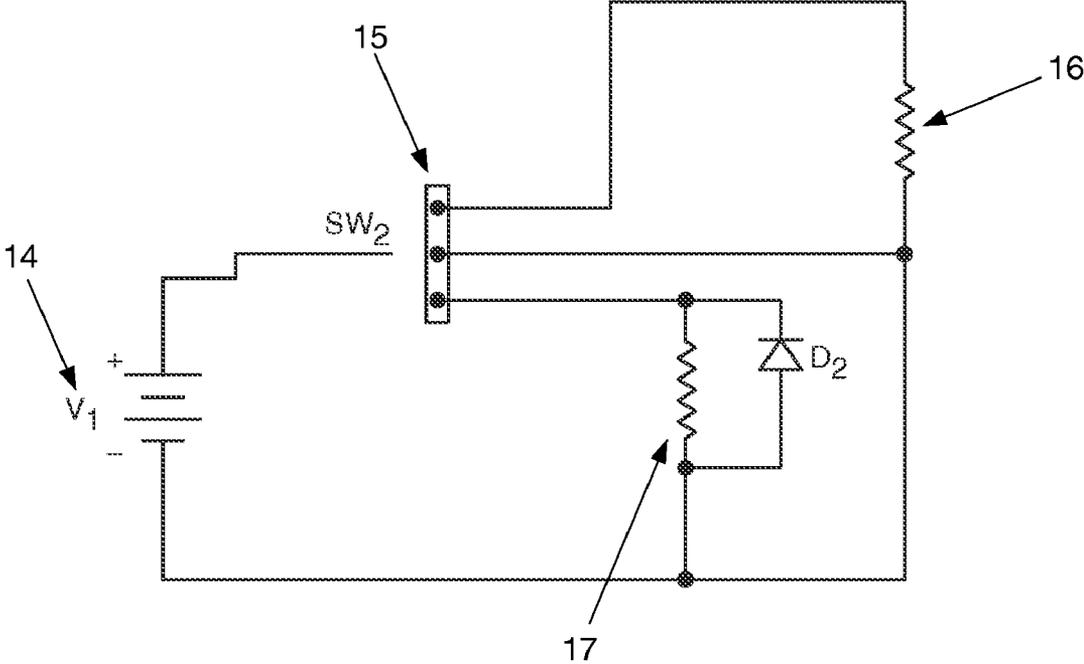
**Fig. 1**



**Fig. 2**



**Fig. 3**



**ELECTRONIC CONTROL OF A WICK CONTAINING FLAMING ENTITY**

**BACKGROUND OF THE INVENTION**

[0001] 1. Field of the Invention

[0002] The present invention relates to lanterns, torches, candles, and similar flaming products that use a wick to continuously replenish and sustain a flame from a reservoir of liquid fuel.

[0003] 2. Description of Related Art

[0004] Existing flaming products, like table lanterns, staked torches, and candles require the user to ignite the exposed wick using a match, lighter, or similar product. In all cases, the ability to ignite requires an additional product to facilitate the wick ignition. In many situations, like jar candles or glass enclosed lanterns, the process of lighting the wick can cause burns upon the fingers. The need for user interaction with matches, lighters, and the like to ignite candles or lanterns has caused for the recent proliferation of incandescent or fake candles (also know as flameless candles). However, while these flame mimics provide the convenience and safety of ignition desired by the user, the executions lack the natural and preferred ambiance of a flickering, natural, and genuine flame.

[0005] In general, the present invention endeavors to solve the shortcomings of both existing natural flaming products and electronic alternatives.

**SUMMARY OF THE INVENTION**

[0006] The present invention is an apparatus that allows a torch, lantern, or candle user to ignite an actual flame electronically with the turn of a switch. Furthermore, this invention provides the means for the user to remove the flame without the need to blow it out or manually snuff the flame.

[0007] Generally, the device employs a filament to ignite the flame upon or near the exposed wick. When the user rocks a two position switch in one direction, the filament heats to an ignition temperature for a predetermined amount of time u generally enough to ignite the saturated wick upon the lantern, candle, or torch. In a similar fashion, when the user rocks the switch to the alternate position, a solid sheath emerges from the shaft of the wick to completely enclose the wick sufficiently enough for a long enough time to snuff the flame on demand. Because the sheath is open ended, the extension of the sheath must protrude beyond the surface of the wick enough to starve the wick of available oxygen.

[0008] The incorporation of the basic electronic mechanisms for ignition and snuffing then allows the user to ignite and snuff multiple units simultaneously, pre-program a duration of operation, program the flaming unit to turn itself off after a period of time, and to operate a flaming item that is out of manual reach.

**DESCRIPTION OF THE DRAWINGS**

[0009] FIG. 1 is a general view of the basic integrated system in the form of a table lantern.

[0010] FIG. 2 is a cross-sectional detail of the core lighting and snuffing mechanisms.

[0011] FIG. 3 is an electrical schematic of the basic power circuit.

**DETAILED DESCRIPTION OF THE INVENTION**

[0012] As shown in FIG. 1, the general assembly of this invention in the form of a table lantern. In this version of the invention, a fuel container 1 holds the liquid fuel 2 that saturates the wick 3. Once the wick is saturated with fuel, ignition is accomplished by depressing the rocker switch 4 to one direction. The closing of that circuit causes the 1.5V DC power supply 5 to provide power to the resistive filament 6. The filament is matched to the power supply in such a manner as to glow hot and exceed the fuel ignition temperature causing the formation of a combusting flame upon the wick. The wick is porous enough to provide continuous replenishment of the fuel to the flame.

[0013] Upon determination that the flame should be extinguished, a user can depress the rocker switch in an alternate direction. This closes the circuit that uses the same 1.5V DC power supply that ignited the flame to power wound coil electromagnet 7. The energized coil induces the metal sheath 8 to move upward until it is stopped at it uppermost vertical position. In this position, the sheath extends beyond the wick sufficiently enough to starve the flame of oxygen and therefore extinguishes combustion. Once accomplished, the user can allow the rocker switch to return to its neutral position and the sheath fall gravitationally back to its resting location u allowing the wick to be lit once again whenever the user desires. The product housing is comprised of a top 10 that also acts as a flame guard, a base 11, and an electronics guard 12 on the lower surface of the top.

[0014] FIG. 2 shows the mechanism of FIG. 1 in more detail. In this drawing, the filament 6 is posted into the wick 3 such that it is not in direct contact with the wick. By doing so, consumption of the wick is minimized. The filament must be close enough to the wick surface such that the radiant energy supplied by the energized filament heats the fluid fuel beyond its ignition temperature. The posts 9 that support the filament can be imbedded in the wick material. The posts also serve as the electrical connection to the power supply and extend down the wick through the sheath and emerge beneath the lower resting position of the wick sheath. From there, the electrical connections to the rocker switch and the power supply are made. In this manner the filament circuit is unharmed by any movement of the wick sheath.

[0015] FIG. 2 also shows the wound coil suspended to the inner and upper surface of the flame guard by using a multiple brackets 13. Similarly, the DC power supply is held in place by means of a standard battery mounting bracket. The geometric or special relationship between the wound coil and the moving sheath is in such a way that when the metallic or induced section of the sheath is perfectly centered within the coil along the length axis of the sheath, the upper portion of the sheath is extended far enough to extinguish the flame. An alternative to a sheath composed of a single ferrous material is a compound sheath comprised of aluminum (or non-ferrous) material on the top or through out and ferrous on only the lower half. This combination will allow for greater vertical movement in a given vertical area and make the sheath take up less space and be equivalently effective.

[0016] FIG. 3 shows the basic electronic circuit that drives the mechanisms. The power source used in this schematic is a 1.5V C-cell battery 14. Alternatively, any level of DC or AC current can drive the mechanisms in this invention. Addition-

ally, this circuit can be easily modified to allow for timing circuits, other programmable capabilities, or a fail safe execution that pre-charge the snuffing circuit by using a capacitor or similar temporary energy storage unit. The power source connects to two circuits through a 3 position switch 15. The switch rests at a neutral position, connected to neither active position. When rocked one direction, a resistive filament 16 heats and sustains the heat until the switch is released. When the switch is held in the third position, a magnetic coil 17 energized and affects movement upon the wick sheath shown in FIG. 1 and FIG. 2.

[0017] Whilst the above has been given by way of illustrative embodiment of the invention, all such variations and modifications thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of the invention and herein defined in the appended claims.

We claim:

1. A wick containing apparatus that uses a wick to transport a combustible liquid fuel to sustain a flame upon the wick comprising:

- a wick capable of producing illumination,
- means for ignition of the wick using an electrical current driven filament that reaches ignition temperature adjacent to the wick,

and

- means for electrically controlling the means for ignition.

2. The wick containing apparatus according to claim 1, further comprising:

- a sheath positioned around the wick and capable of sliding along the wick,
- means for moving the sheath along the wick,

and

- means for electrically controlling the sheath, such that the sheath may move to a position along the wick to extinguish the flame.

3. The wick containing apparatus according to claim 2, wherein the means for electrically controlling the means for ignition and the means for electrically controlling the sheath, may be activated by an activation signal from a user.

4. The wick containing apparatus according to claim 3, wherein the means for electrically controlling the sheath is activated to extinguish the flame after a given period of time after activation of the means for ignition.

5. The wick containing apparatus according to claim 1, wherein the electrical current is a direct current.

6. The wick containing apparatus according to claim 1 wherein the electrical current is an alternating current.

7. The wick containing apparatus according to claim 2, further comprising a remote control means to send a signal to the means for electrically controlling the means for ignition and the means for controlling the sheath.

8. The wick containing apparatus according to claim 7, wherein the remote control means utilizes a radio frequency signal.

9. The wick containing apparatus according to claim 2 further comprising a capacitor to store enough energy to actuate the means for electrically controlling the sheath prior to igniting the wick to ensure there is sufficient energy stored to activate the means for controlling the sheath to extinguish the flame at the time of igniting the flame.

10. The wick containing apparatus according to claim 2, further comprising a timing circuit to automatically activate the means for controlling the sheath to extinguish the flame after a predetermined length of time.

11. The wick containing apparatus according to claim 2, wherein the means for controlling the means for ignition and the means for controlling the sheath are contained as a part of a preprogrammed and repeating sequence.

12. The wick containing apparatus according to claim 2, wherein at least two units of the apparatus may be connected in an array and can be controlled together.

13. The wick containing apparatus according to claim 12, wherein a master wick containing apparatus may be controlled by a user and at least one mimic wick containing apparatus is connected to the master apparatus and controlled in the same manner as the master wick containing apparatus.

14. The wick containing apparatus according to claim 13, wherein a wire connection connects the master wick containing apparatus to the at least one mimic wick containing apparatus.

15. The wick containing apparatus according to claim 13, wherein a radio frequency control connection connects the master wick containing apparatus to the at least one mimic wick containing apparatus.

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