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(54) **ELECTRONIC CIGARETTE DEVICE**

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(57)

**ABSTRACT**

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This invention discloses an electronic cigarette device which comprises a central controller, a sensor for detecting a working state of the electronic cigarette device, and a multi-color LED indicator capable of emitting a variety of different colors of light. The central controller controls the multi-color LED light to work in different modes for respectively indicating various working states of the electronic cigarette device according to signals detected by the sensor. The multi-color LED indicator comprises multiple monochromatic LED lights which emit different colors of light. The multi-color LED indicator provided at the electronic cigarette device can indicate the working states of the electronic cigarette device by different working modes thereof, to achieve plenty indication and effectively meet the requirements.

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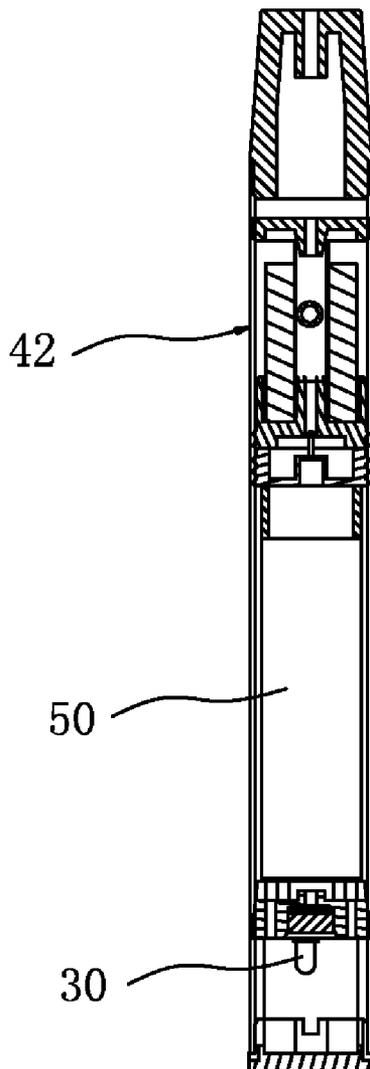
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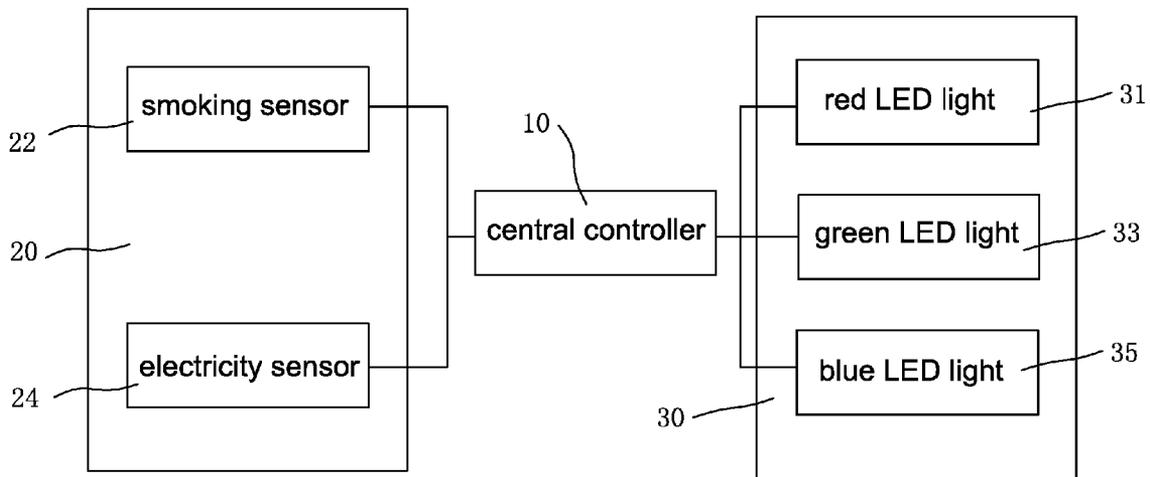


FIG. 1

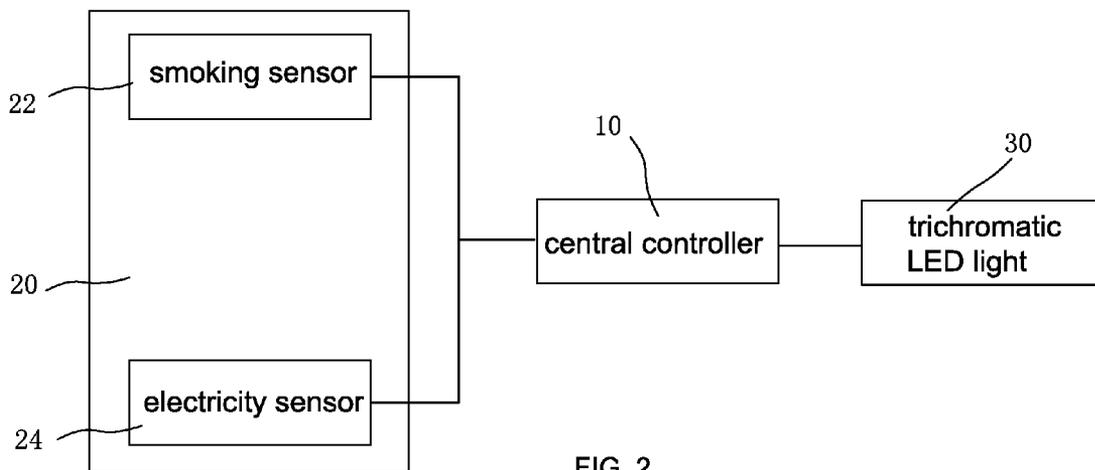


FIG. 2

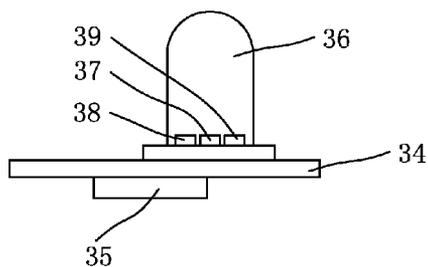


FIG. 3

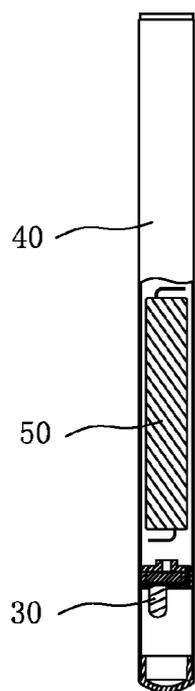


FIG. 4

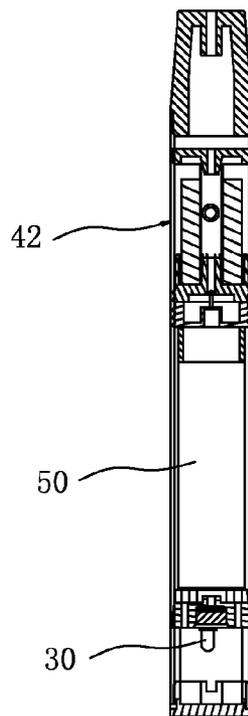


FIG. 5

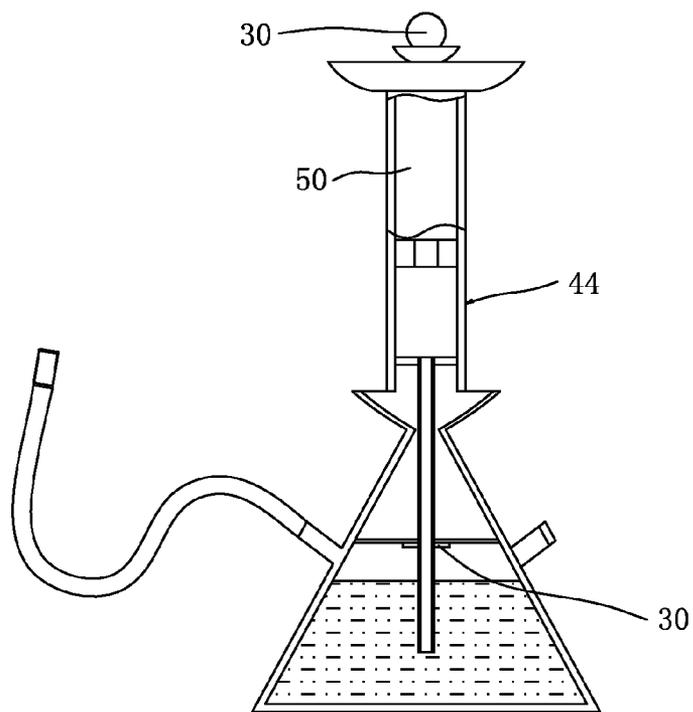


FIG. 6

| color of light | remaining charge |
|----------------|------------------|
| red            | 0%               |
| orange         | 25%              |
| yellow         | 50%              |
| chartreuse     | 75%              |
| green          | 100%             |

FIG. 7

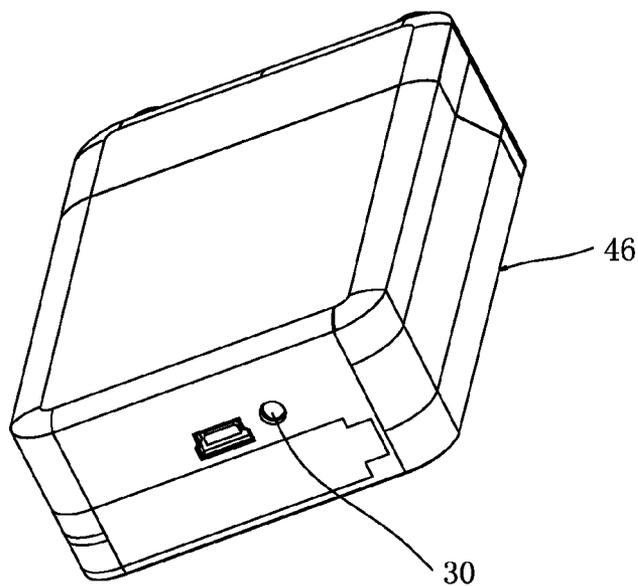


FIG. 8

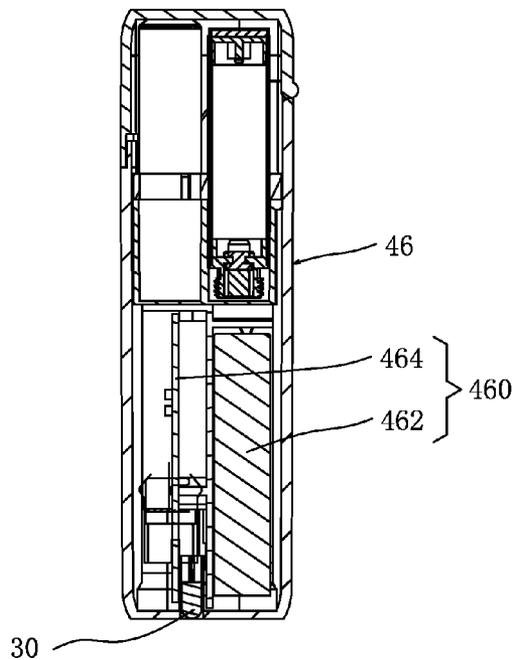


FIG. 9

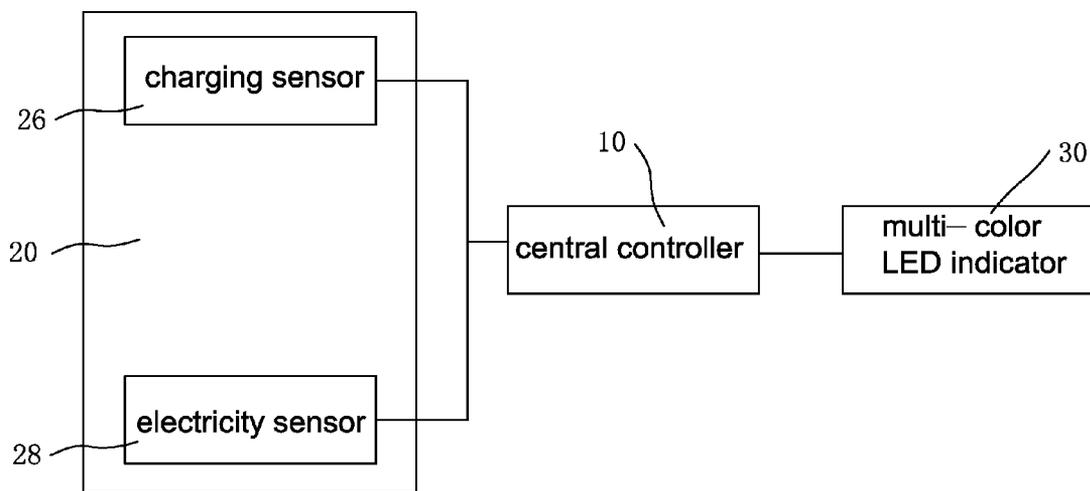


FIG. 10

**ELECTRONIC CIGARETTE DEVICE**

**TECHNICAL FIELD**

[0001] This invention relates to electronic simulating cigarette technologies, and particularly relates to an electronic cigarette device having state indication function.

**DESCRIPTION OF BACKGROUND**

[0002] Currently, electronic cigarette devices such as electronic cigarettes, electronic cigars, electronic hookah and electronic cigarette case, have equipped with the monochrome LED lights as an indicator, for indicating the working state of the electronic cigarette devices. Since the light emitted from the monochrome LED lights is monotonous in color, the indication effect is not prominent and gorgeous enough. Furthermore, because the monochrome LED lights can only emit light of one color, they are unable to effectively indicate multiple different working states, and hardly meet actual requirements.

**SUMMARY**

[0003] The technical problems can be solved by the present invention is: to provide an electronic cigarette device which can distinctively indicate working states of the electronic cigarette device.

[0004] To solve the above technical problem, the present invention provides an electronic cigarette device which comprises a central controller, a sensor for detecting a working state of the electronic cigarette device, and a multi-color LED indicator capable of emitting a variety of different colors of light. The central controller controls the multi-color LED light to work in different modes for respectively indicating various working states of the electronic cigarette device according to signals detected by the sensor.

[0005] Furthermore, the multi-color LED indicator comprises multiple monochromatic LED lights which emit different colors of light.

[0006] Furthermore, the multiple monochromatic LED lights at least comprise a red LED light, a green LED light and a blue LED light.

[0007] Furthermore, the multi-color LED indicator is a trichromatic LED light, the trichromatic LED light is positioned on a PCB substrate, and a control chip is set up on the PCB substrate to control light emitting of the trichromatic LED light, and the trichromatic LED light comprises a red LED chip, a green LED chip and a blue LED chip integrally encapsulated by a transparent package.

[0008] Furthermore, the electronic cigarette device is an electronic cigarette, an electronic cigar or an electronic hookah, and the electronic cigarette device is provided with a rechargeable battery therein.

[0009] Furthermore, the sensor comprises a smoking sensor for detecting whether the electronic cigarette device is working in a smoking state and an electricity sensor for detecting a remaining charge of the rechargeable battery.

[0010] Furthermore, the multi-color LED indicator is provided at top, middle or bottom of the electronic cigarette device.

[0011] Furthermore, the electronic cigarette device is an electronic cigarette case for storing an electronic cigarette or an electronic cigar therein, in which a power supply unit is provided to charge the electronic cigarettes or the electronic cigar.

[0012] Furthermore, the power supply unit comprises a rechargeable battery and a charging control circuit, the sensor comprises a charging sensor for detecting whether the electronic cigarette case is working in a state of charging the electronic cigarette or the electronic cigar stored therein, and an electricity sensor for detecting the remaining charge of the rechargeable battery of the power supply unit.

[0013] Furthermore, the multi-color LED indicator is provided at top, middle or bottom of the electronic cigarette device.

[0014] The technical benefits of the electronic cigarette device of the present invention is that: the multi-color LED indicator provide at the electronic cigarette device can indicate the working states of the electronic cigarette device by different working modes thereof, for example, to indicate the smoking mode of the electronic cigarette device, such as, electronic cigarette, electronic cigar and electronic hookah or the charging mode of the electronic cigarette case which is charging the electronic cigarette or the electronic cigar stored therein, by the way of stroboscopic mode, or to indicate the remaining charge of the rechargeable battery of the electronic cigarette device by different colors of light so as to allow users to know about the electricity and charge promptly.

[0015] The present invention would be further described in detail as follows.

**DESCRIPTION OF THE DRAWINGS**

[0016] FIG. 1 is a block diagram of an electronic cigarette device in accordance with a first embodiment of the present invention.

[0017] FIG. 2 is a block diagram of an electronic cigarette device in accordance with a second embodiment of the present invention.

[0018] FIG. 3 is a schematic diagram of a trichromatic LED light of the second embodiment installed to a PCB substrate.

[0019] FIG. 4 is a schematic diagram of an electronic cigarette device which serves as an electronic cigarette.

[0020] FIG. 5 is a schematic diagram of an electronic cigarette device which serves as an electronic cigar.

[0021] FIG. 6 is a schematic diagram of an electronic cigarette device which serves as an electronic hookah.

[0022] FIG. 7 is a table for illustrating the corresponding relationship of the remaining charge of the electronic cigarette device with the colors of the light emitted from a multi-color LED indicator.

[0023] FIG. 8 is an isometric view of an electronic cigarette device which serves as an electronic cigarette case.

[0024] FIG. 9 is a cross-sectional view of an electronic cigarette device which serves as an electronic cigarette case.

[0025] FIG. 10 is a circuit block diagram of an electronic cigarette device which serves as an electronic cigarette case.

**DETAILED DESCRIPTION OF THE EMBODIMENTS**

[0026] It should be noted that various embodiments and characteristics of this application can be mutually combined if without conflict, the invention would be described in detail as follows in combination of drawings and specific embodiments of the present invention.

[0027] As shown in FIG. 1, an electronic cigarette device provided in an embodiment of the present invention comprises a central controller 10, a sensor 20 for detecting a

working state of the electronic cigarette, and a multi-color LED indicator 30 capable of emitting a variety of different colors of light.

[0028] According to signals detected by the sensor 20, the central controller 10 controls the multi-color LED indicator 30 to work in different modes for respectively indicating various working states of the electronic cigarette device.

[0029] In the embodiment as shown in FIG. 1, the multi-color LED indicator 30 comprises multiple monochromatic LED lights which emit different colors of light. The multiple monochromatic LED lights at least comprise a red LED light 31, a green LED light 32 and a blue LED light 33, and the multiple monochromatic LED lights respectively work independently under the control of the central controller 10.

[0030] In the embodiment as shown in FIG. 2, the multi-color LED indicator 30 is a trichromatic LED light. As shown in FIG. 3, the trichromatic LED light comprises a red LED chip 37, a green LED chip 38 and a blue LED chip 39 integrally encapsulated by a transparent package 36. The trichromatic LED light is positioned on a PCB substrate 34, and a control chip 35 is set up on the PCB substrate 34 to control light emitting of the trichromatic LED light.

[0031] In the three embodiments as shown in FIG. 4 to FIG. 6, the electronic cigarette devices are respectively corresponded to an electronic cigarette 40, an electronic cigar 42 and an electronic hookah 44, and the electronic cigarette devices are all provided with a rechargeable battery 50 therein. Accordingly, the sensor 20 comprises a smoking sensor 22 for detecting whether the electronic cigarette device is working in a smoking state and an electricity sensor 24 for detecting the remaining charge of the rechargeable battery 50. Specifically, the smoking sensor 22 may be a pneumatic-type sensor, which generates a corresponding smoking signal by detecting the air pressure changes during smoking; or the smoking sensor 22 may be a push-button-type sensor, which generates a corresponding smoking signal when the electronic cigarette device switches into a smoking state by pressing the push-button-type sensor. The multi-color LED indicator 30 is provided at top, middle or bottom of the electronic cigarette device. In the embodiment as shown in FIG. 6, the electronic hookah is respectively provided with a multi-color LED indicator 30 at top and middle thereof. After the electronic cigarette device is turned on, the central controller 10 distinctively indicate the electricity of the rechargeable battery 50 by different colors of light, according to the remaining charge of the rechargeable battery 50 detected by the electricity sensor 24. The color of the light emitted from the multi-color LED indicator 30 is changed in gradient according to the change of the remaining charge, for example, changed in turn from green to yellow and then to red. FIG. 7 illustrates the corresponding relationship of the remaining charge with the colors of the light. When the smoking sensor 22 detects that the electronic cigarette device is working in smoking mode, the central controller 10 thus controls the multi-color LED indicator 30 to work in a stroboscopic mode by the way of multi-color cycle or monochromatic flashes.

[0032] In the embodiment as shown in FIG. 8 to FIG. 10, the electronic cigarette device is an electronic cigarette case 46 for storing an electronic cigarette or an electronic cigar therein, in which a power supply unit 460 is provided to charge the electronic cigarettes or the electronic cigar. The power supply unit 460 comprises a rechargeable battery 462 and a charging control circuit 464. The sensor 20 comprises a charging sensor 26 for detecting whether the electronic cig-

rette case 46 is working in a state of charging the electronic cigarette or the electronic cigar stored therein, and an electricity sensor 28 for detecting the remaining charge of the rechargeable battery 462 of the power supply unit 460. The multi-color LED indicator 30 is provided at top or bottom of the electronic cigarette device. After the electronic cigarette device is turned on, the central controller 10 distinctively indicate the electricity of the rechargeable battery 50 by different colors of light, according to the remaining charge of the rechargeable battery 462 detected by the electricity sensor 28. The color of the light emitted from the multi-color LED indicator 30 is changed in gradient according to the change of the remaining charge. The corresponding relationship of the remaining charge with the colors of the light can also be referenced in FIG. 7. When the charging sensor 26 detects that the electronic cigarette device is working in charging mode, the central controller 10 thus controls the multi-color LED indicator 30 to work in a stroboscopic mode by the way of multi-color cycle or monochromatic flashes.

[0033] Although embodiments of the present invention are shown and described above, for the persons of ordinary skill in this field, it can be understood that various changes, modifications, substitutes and variants to the embodiments within the spirit of the present invention can be made, and the scope of this invention is determined by the appended claims and their equivalents.

What is claimed is:

1. An electronic cigarette device, wherein the electronic cigarette device comprises a central controller, a sensor for detecting a working state of the electronic cigarette device, and a multi-color light emitting diode (LED) indicator capable of emitting a variety of different colors of light, the central controller controls the multi-color LED light to work in different modes for respectively indicating various working states of the electronic cigarette device according to signals detected by the sensor.

2. The electronic cigarette device as described in claim 1, wherein the multi-color LED indicator comprises multiple monochromatic LED lights which emit different colors of light.

3. The electronic cigarette device as described in claim 2, wherein the multiple monochromatic LED lights at least comprise a red LED light, a green LED light and a blue LED light.

4. The electronic cigarette device as described in claim 1, wherein the multi-color LED indicator is a trichromatic LED light, the trichromatic LED light is positioned on a PCB substrate, and a control chip is set up on the PCB substrate to control light emitting of the trichromatic LED light, and the trichromatic LED light comprises a red LED chip, a green LED chip and a blue LED chip integrally encapsulated by a transparent package.

5. The electronic cigarette device as described in claim 1, wherein the electronic cigarette device is an electronic cigarette, an electronic cigar or an electronic hookah, and the electronic cigarette device is provided with a rechargeable battery therein.

6. The electronic cigarette device as described in claim 5, wherein the sensor comprises a smoking sensor for detecting whether the electronic cigarette device is working in a smoking state and an electricity sensor for detecting a remaining charge of the rechargeable battery.

7. The electronic cigarette device as described in claim 5, wherein the multi-color LED indicator is provided at top, middle or bottom of the electronic cigarette device.

8. The electronic cigarette device as described in claim 1, wherein the electronic cigarette device is an electronic cigarette case for storing an electronic cigarette or an electronic cigar therein, in which a power supply unit is provided to charge the electronic cigarettes or the electronic cigar.

9. The electronic cigarette device as described in claim 8, wherein the power supply unit comprises a rechargeable battery and a charging control circuit, the sensor comprises a charging sensor for detecting whether the electronic cigarette case is working in a state of charging the electronic cigarette or the electronic cigar stored therein, and an electricity sensor for detecting the remaining charge of the rechargeable battery of the power supply unit.

10. The electronic cigarette device as described in claim 8, wherein the multi-color LED indicator is provided at top, middle or bottom of the electronic cigarette device.

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