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(54) **ILLUMINATED TRAMPOLINE**

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(76) Inventor: **Samuel Chen, Kowloon (CN)**

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Correspondence Address:

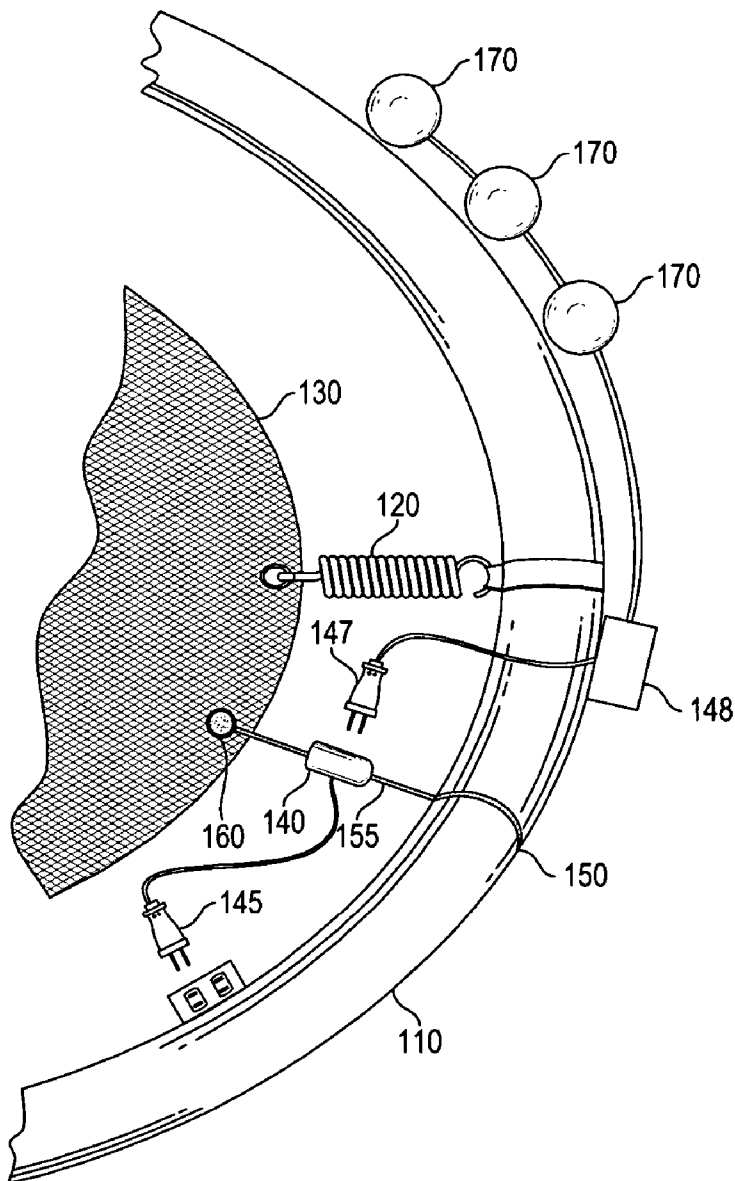
**LAW OFFICES OF CLEMENT CHENG**  
**17220 NEWHOPE STREET #127**  
**FOUNTAIN VALLEY, CA 92708 (US)**

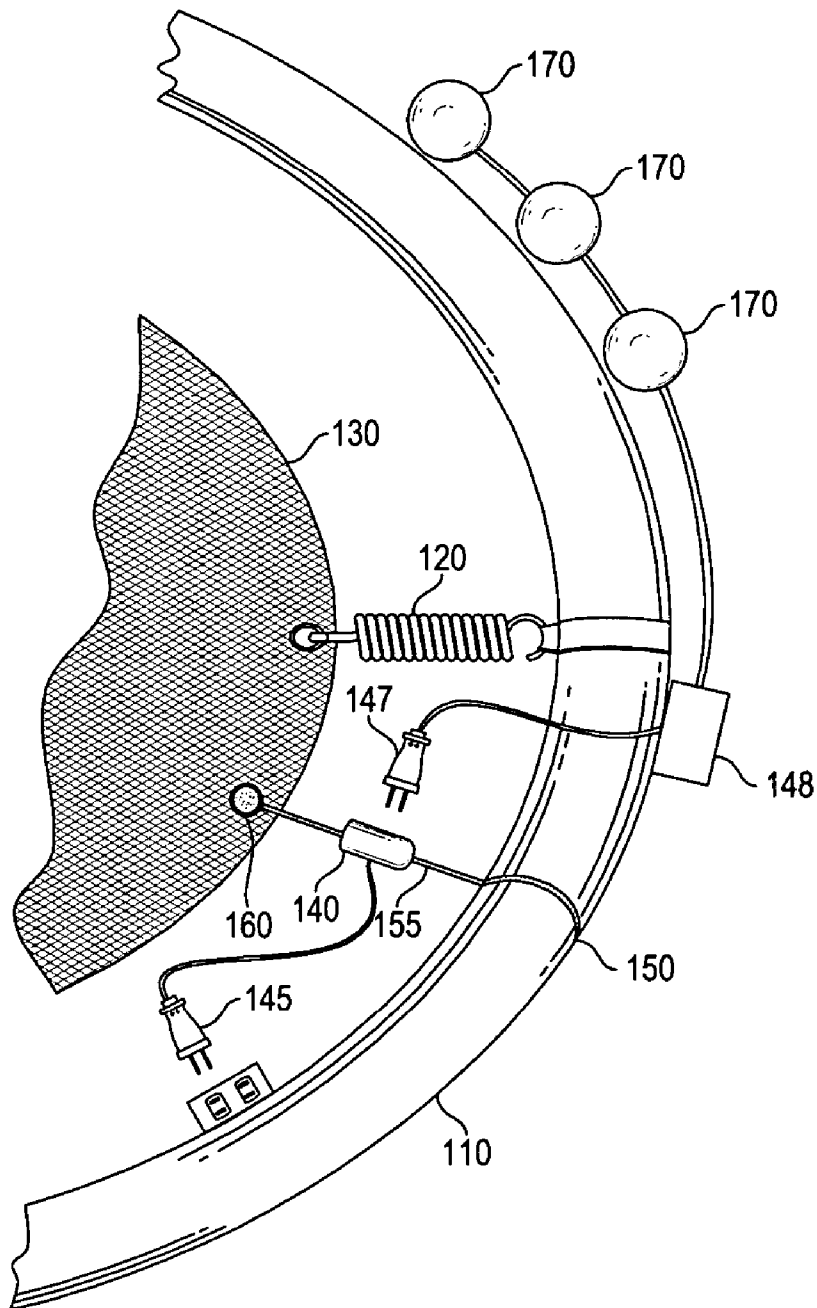
(57) **ABSTRACT**

A trampoline having a frame, a bounce member and a bounce sensor, sensing bounces activates lights and provide sounds for entertainment and training purposes. A control box interprets a variety of inputs from the bounce sensors and outputs a variety of lights and sounds.

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*Fig. 1*

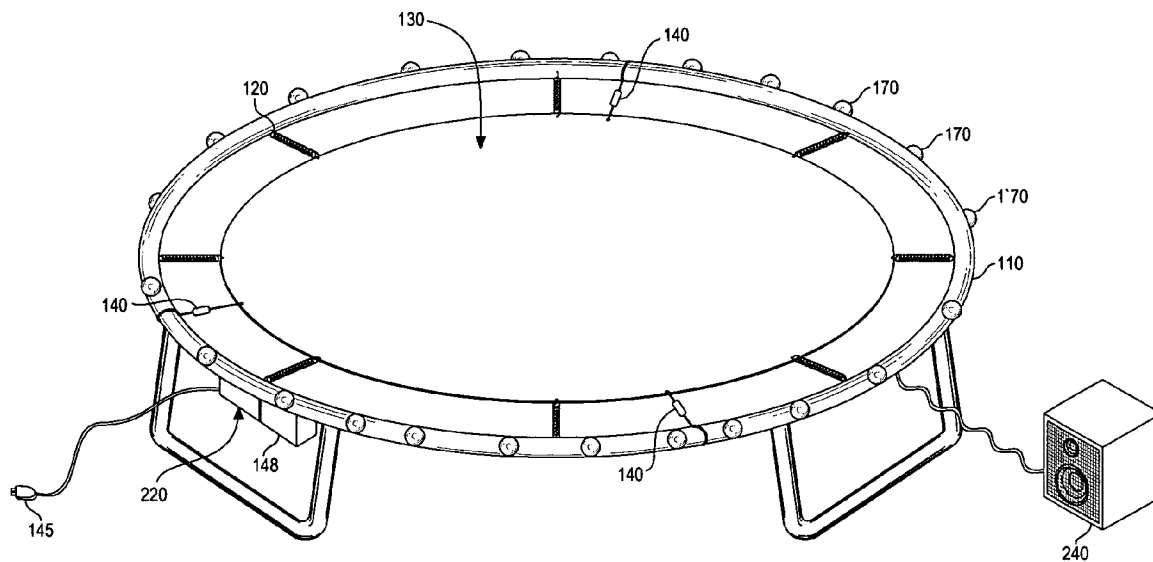


Fig. 2

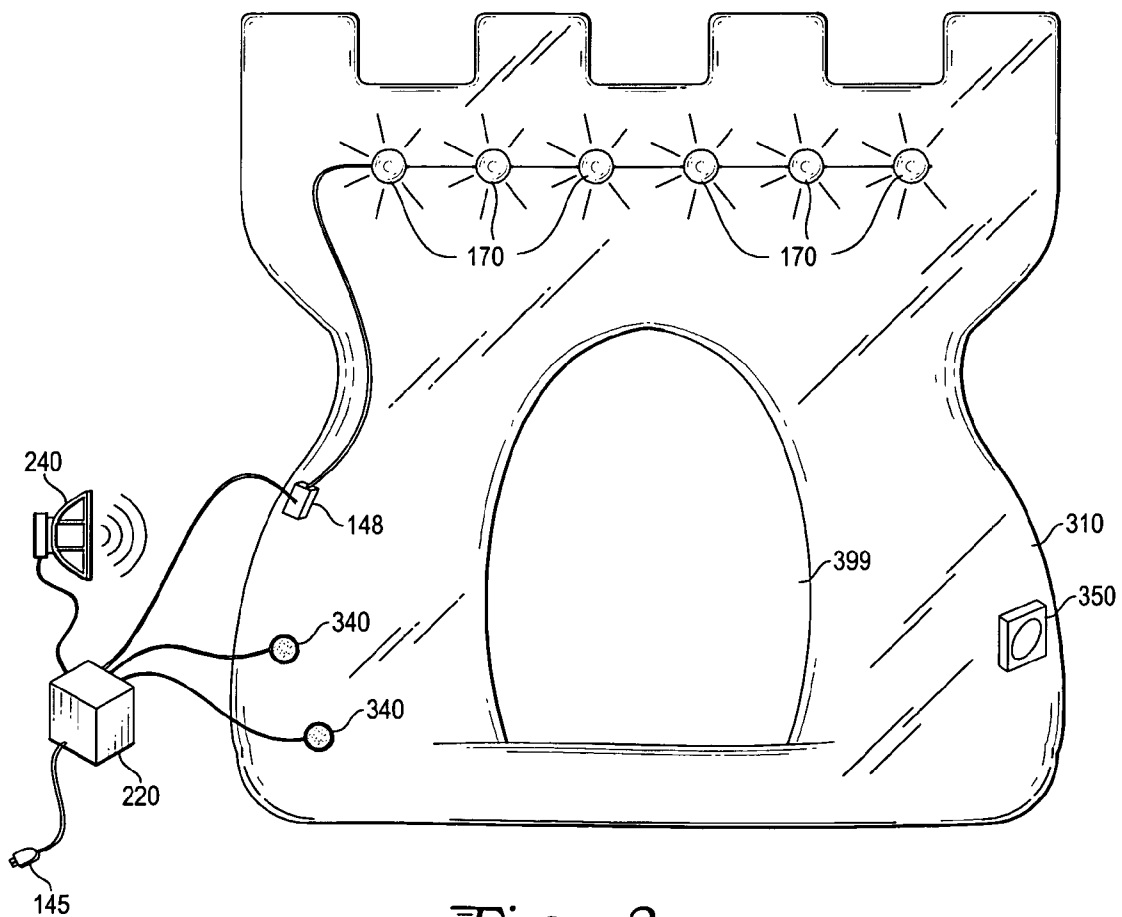


Fig. 3

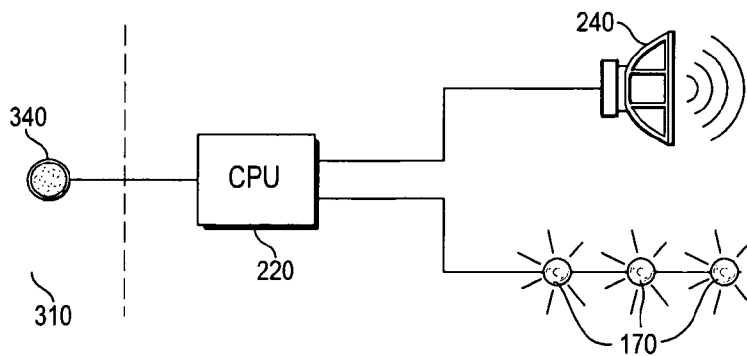


Fig. 4

## ILLUMINATED TRAMPOLINE

### DISCUSSION OF RELATED ART

[0001] Trampolines have been a fun and exciting backyard exercise. Learning to trampoline requires learning timing. A variety of somersaults, flips and pikes can be learned and developed into a choreographed routine.

[0002] A variety of trampoline structures have been created since the traditional steel frame trampoline with nylon sheet supported by springs. One of the newer structures includes inflatable bounce member having air bounce replacing springs. In either case, trampoline instruction is specialize and individual personal training services are expensive. Therefore, trampoline aids and accessories are oftentimes helpful for the amateur backyard enthusiast.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIG. 1 is a close up view of the bounce sensor mounting.

[0004] FIG. 2 is a prespective system view of the trampoline.

[0005] FIG. 3 is diagram of an inflatable trampoline having a castle theme.

[0006] FIG. 4 is an electrical diagram.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0007] The invention includes lights and sound created when a bounce sensor on the bounce member senses a bounce. For the traditional steel frame and sheet supported by springs, a bounce sensor can be formed as an electrical switch, a pressure gauge, a strain gauge or a piezoelectric element. The preferred mode is a pull switch mounted to the spring or sheet. Pull switches are commonly sold having two positions and may include a brass body and knob mounted on a washer and nut threaded portion. The switches often contain stainless steel springs for durably.

[0008] Although these switches are commonly known and commonly available in electrical supply stores, new designs for these switches have appeared in United States patents. For example, Dutkiewicz U.S. Pat. No. 6,743,996 issued Jun. 1, 2004 provides a pull chain switch having a spring of a first stiffness mounted with a spring of a second stiffness. U.S. Pat. No. 6,743,996 is incorporated herein by reference. In any case, a pull switch of old design or new design is sufficient as long as it acts as a sensor of the bounce.

[0009] FIG. 1 shows a perspective view of a trampoline. The frame 110 is connected to a spring 120 that is connected to a bounce member 130 formed as a sheet commonly made of nylon material. When a user lands on the trampoline bounce member 130 a plurality of springs 120 retain potential energy and bounce the user. A switch 140 can be attached to the frame at a frame switch connection 150. The frame switch connection 150 is preferably an elastic cord 155. The switch can be attached to the bounce member 130 by a bounce member switch connection 160. An elastic cord 155 can also make the bounce member switch connection 160.

[0010] When the user lands on the trampoline bounce member 130, the switch 140 is pulled so that it completes a

circuit. The switch 140 if based on standard 120V AC power can be plugged into a standard socket. The switch can also have a standard socket capable of receiving a standard plug 147. In the preferred embodiment, the plug 147 is attached to a voltage former 148 that transforms the electricity to DC power. The electricity is then used to light lighting elements 170 that can be mounted on the frame 110. The lights can be of commonly available LED's, incandescent or fluorescent technology.

[0011] Figure two is an alternate view of the invention, showing 3 bounce sensors 140 that are pull switches. Three bounce sensors 140 should be used so that differences in spring rigidities 120 may have less impact on sensor calibration. Also, having three sensors 140 allows backup in case of sensor failure. In the case of multiple pull switch bounce sensors, the placement of the bounce sensors are preferably around the periphery of the trampoline between the trampoline frame and the trampoline bounce member formed as a sheet. Using multiple pull switch bounce sensors of low sensitivity allows a user to selectively activate bounce sensors. A user jumping in the middle of the trampoline may be able to activate all bounce sensors when the user is making large jumps and bounces. A user jumping off center at one side of the trampoline may be able to selectively activate only the bounce sensors closer to the one side. A control box may process input from selective activation of bounce sensors and output selective activation of light elements. The control box can optionally activate light elements mounted on the frame close to the activated sensors. Thus, a user may control activation of light elements.

[0012] The pull switch sensors can be tuned in sensitivity. Internal springs within the pull switch sensors can be calibrated for variation in sensitivity. Alternatively, the sensors can be calibrated in sensitivity by having a pair of attachment points, a first attachment attaching to the frame and a second attachment point and attaching to the bounce member formed as a sheet. A user uses highly elastic cord connection for lower sensor sensitivity and low elastic cord connection for higher sensor sensitivity.

[0013] The additional element shown in figure two is a control box 220 having a CPU that is preferably an integrated circuit or circuit board such as a PCB to control the logic of the light illumination 170. Typical pull switches complete a circuit when the switch pull is pulled. Some switches complete a circuit on a first pull and open a circuit on a second pull. Therefore, a control box 220 having a CPU can accommodate different switches and provide different outputs.

[0014] Also, bounce sensors have varying levels. A bounce sensor such as a pull switch may sense a strong pull and a weak pull. Also, the control box 220 may count the number of pulls before activating lights. The control box may also activate the lights in a flashing, intermittent, constant or random mode. For example, the control box may be programmed to provide no light output on a first pull, a short flash of light output on a second pull, a continuous on light on a fourth pull and a reset of the program on an eighth pull. The control box can thus be programmed to remind a user of the number of bounces. In a random mode, the control box 220 can provide for example, no light output on a first pull a random number of flashes of light output on a

second pull, and from 3 to 7 flashes of light on a fourth pull. The random mode can be used for entertainment purposes. With multiple sensitivities and sensor thresholds, the control box can activate light elements at a first sensor threshold and sound and a second sensor threshold.

[0015] In the inflatable trampoline embodiment, the bounce sensor is a differential pressure switch. A variety of pressure sensors are also commonly available. Commonly available pressure transducers have a wide temperature range and can output a wide voltage range depending on application. Such sensors are small and can measure pressures from vacuum to thousands of PSI. Although pressure transducers are basically equivalent to switches, they do not need to be mounted to the wall of the bounce member and could be placed inside the bounce member. Because of the current application, the pressure sensor does not need to be of high accuracy as compared to other industrial applications.

[0016] Figure three shows an inflatable trampoline having a castle theme. The entrance 399 is shaped as a drawbridge suggesting a castle shape. The inflatable castle has a fan 350 inflating the frame enclosure 310 and bounce member 130. The bounce member is preferably connected to the frame enclosure 310 such that air communicates between the frame enclosure 310 and bounce member 130. Oftentimes, the frame enclosure and bounce member are integrally formed and lacking perceptible demarcation. the air pressure sensor 340 can be placed inside the inflatable portion, or mounted on the wall of the inflatable enclosure. The air pressure sensor sends input data to a control box 220. The control box plugs into electricity by plug 145. The control box optionally sends output to a voltage transformer that controls lights mounted on the inside or outside of the frame enclosure 310. The control box 220 also outputs audio signal to a speaker 240. In the case of an inflatable trampoline, the bounce member and inflatable frame are often semi translucent. Thus, illumination elements 170 can be placed within the bounce member or in inflatable frame.

[0017] The control box can be programmed to provide light when it is sensing a bounce, or provide a certain number of minutes of uninterrupted light upon a bounce, or switch the lights on and off with each bounce, or a wide variety of different user selected outputs.

[0018] The control box can also provide a sound output 240 from a speaker 240. The sound can be stored on flash memory in the control box 220. The control box can provide a simple beat, music, classical music, thematic music, rock-and-roll or other genres. In entertainment modes, the control box can provide sound effects such as animals "moo," "baa," "roar", machinery sounds, cartoon sounds "boing," "gong", celebrity voices & phrases or other user recorded sounds.

[0019] The sounds preferably correlate to the bounce sensor input to provide training, or entertainment. For example, a beat can be used in conjunction with light flashing in a training mode. When a user lands on the beat, the lights activate to show proper timing. Optionally, different colored lights such as red, yellow and green lights activate when a user bounces so that a red light activates designating an offbeat bounce, a yellow light activates showing slightly offbeat bounce and a green light activates showing on beat bounce.

[0020] In an entertainment mode, an animal sound such as a roar can activate on a number of bounces. The animal

sound roar sound can be thematically tied to an inflatable trampoline having a lion theme such as a cartoon lion head or otherwise lion decorated inflatable trampoline. Theme music can also be activated on a specified number of bounces and cease when no bounce is detected for a certain amount of time.

[0021] The FIG. 4 shows a circuit diagram of the trampoline. The trampoline body or frame 310 has a bounce sensor 340 mounted on it sending data to an optional control box 220 having a CPU. The control box sends outputs to a speaker 240 and light or illumination elements 170.

CALL OUT LIST OF ELEMENTS

- [0022] 110 Trampoline Frame
- [0023] 120 Trampoline Spring
- [0024] 130 Bounce Member
- [0025] 140 Bounce Sensor
- [0026] 145 Plug For Switch
- [0027] 147 Plug For Light Elements
- [0028] 148 Electrical Transformer
- [0029] 150 Bounce Sensor Connection To Frame
- [0030] 155 Elastic Cord
- [0031] 160 Bounce Sensor Connection To Switch
- [0032] 170 Light Elements

1. A trampoline comprising:
  - a trampoline frame;
  - a bounce member; the bounce member connected to the frame;
  - a bounce sensor, sensing bounces;
  - a light element activated when the bounce sensor senses a bounce.
2. The trampoline of claim 1 further comprising: a control box electrically connected to the bounce sensor and light element, wherein the control box receives input signals from the bounce sensor and wherein the control box controls activation of the light element.
3. The trampoline of claim 2 wherein the control box activates the light element every time it receives an input signal from the bounce sensor.
4. The trampoline of claim 2 wherein the control box activates the light element for a set amount of time after it receives an input signal from the bounce sensor.
5. The trampoline of claim 2 wherein the sounds comprise a beat and the control box activates the light element when a user lands on the trampoline on a beat.
6. The trampoline of claim 2 wherein the sounds are thematic and wherein the control box activates the light element after a specified number of bounces and deactivates the light element when no bounce is detected after a certain amount of time.
7. The trampoline of claim 1 wherein the trampoline frame is inflatable and the bounce sensor is a pressure sensor mounted to the bounce member to monitor the bounce member pressure.

**8.** The trampoline of claim 1 wherein the trampoline frame is rigid and the bounce sensor is a pull switch mounted to the bounce member and frame.

**9.** A trampoline comprising:

a trampoline frame;

a bounce member connected to the frame;

a bounce sensor;

an audio sound activated when the bounce sensor senses a bounce.

**10.** The trampoline of claim 9 further comprising: a control box electrically connected to the bounce sensor and light element, wherein the control box receives input signals from the bounce sensor and wherein the control box controls activation of the audio sound.

**11.** The trampoline of claim 10 wherein the control box activates the audio sound every time it receives an input signal from the bounce sensor.

**12.** The trampoline of claim 10 wherein the control box activates the audio sound for a set amount of time after it receives an input signal from the bounce sensor.

**13.** The trampoline of claim 10 wherein the sounds comprise a beat and the control box activates sounds when a user lands on the trampoline on a beat.

**14.** The trampoline of claim 10 wherein the sounds are thematic and wherein the control box activates the sounds after a specified number of bounces and deactivates the sounds when no bounce is detected after a certain amount of time.

**15.** The trampoline of claim 9 wherein the frame and bounce member are inflatable and the bounce sensor is a pressure sensor mounted to the bounce member to monitor the bounce member pressure.

**16.** The trampoline of claim 9 wherein the trampoline frame is rigid and the bounce sensor is a pull switch mounted to the bounce member and trampoline frame.

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