

[54] CHEMILUMINESCENT TOY

[75] Inventor: Louis E. Benjamin, Sr., Livingston, N.J.

[73] Assignee: The Raymond Lee Organization, Inc. a part interest, New York, N.Y.

[22] Filed: May 8, 1972

[21] Appl. No.: 251,350

[52] U.S. Cl. 46/1 R, 240/2.5, 252/301.2 R

[51] Int. Cl. A63h 33/00

[58] Field of Search 46/1 R, 228; 240/2.5; 252/301.2 R; 273/DIG. 24

[56] References Cited

UNITED STATES PATENTS

2,647,222 7/1953 Nieset 46/1 R
3,494,871 2/1970 Clapp 252/301.2 R

3,612,857 10/1971 Beatty 240/2.5

Primary Examiner—Louis G. Mancene

Assistant Examiner—Robert F. Cutting

Attorney—Howard I. Podell

[57] ABSTRACT

A toy which emits chemiluminescent light at a specific location in response to the squeezing of a flexible bulb, or the temporary local creation of pressure. The light in the toy may be produced behind the eyes of a toy animal, or at any decorative spot on the toy. The light produced may be used for signal purposes or for the purpose of simulating rays or beams of radiation.

The chemiluminescent light is produced by combining a gas formed in a squeeze bottle with a wick or pad which is soaked in a fluorescent chemical.

7 Claims, 3 Drawing Figures

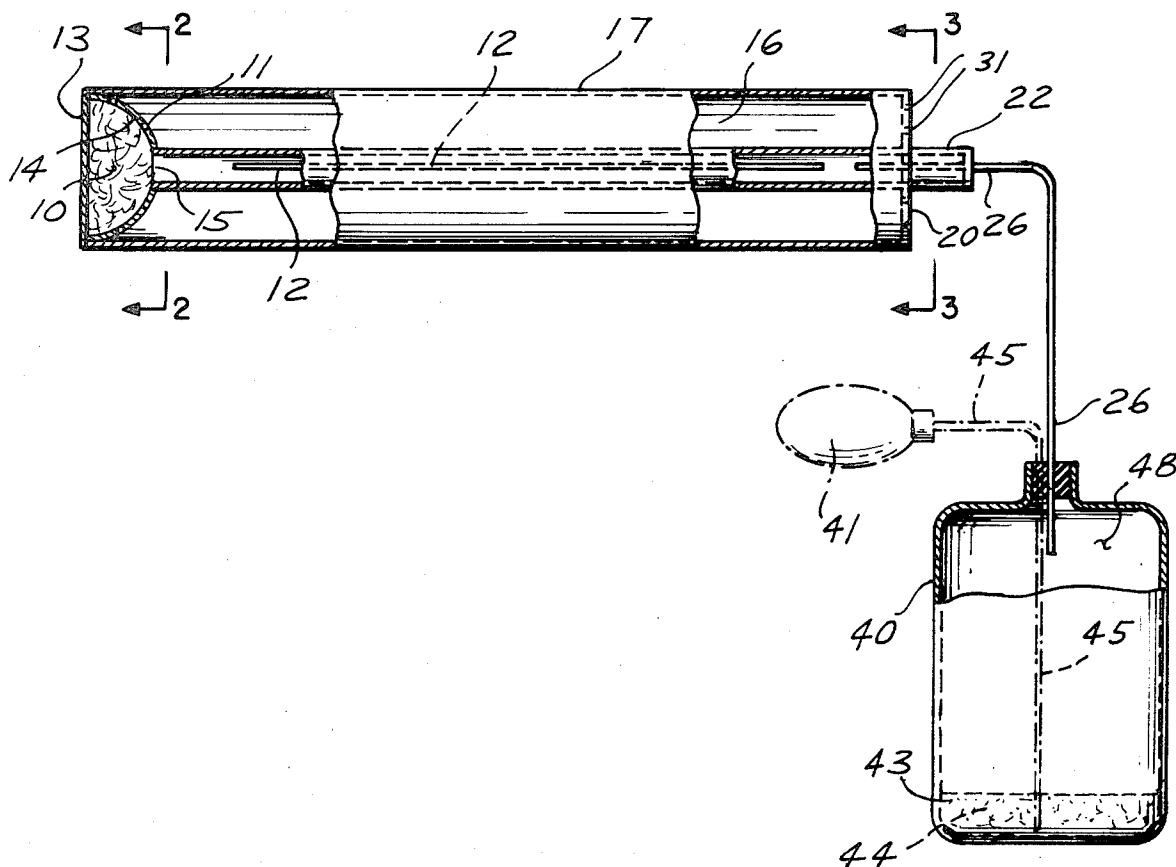


FIG. 1

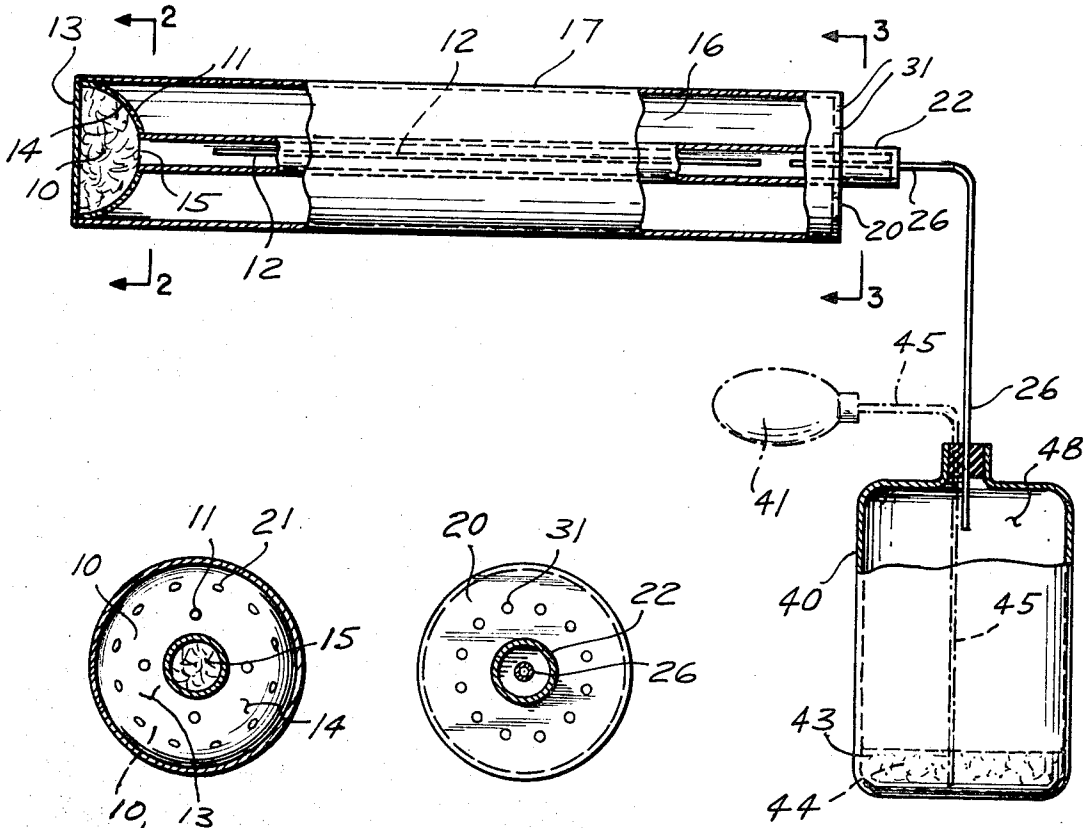


FIG. 2

FIG. 3

CHEMILUMINESCENT TOY

SUMMARY OF THE INVENTION

This invention relates to a means of producing chemiluminescent light at a specific location on a toy, said light being produced in response to the temporary application of pressure on a flexible squeeze bulb.

An advantage of this invention is that the light produced requires no light bulbs, no wires, no batteries or other heat or electrical means.

A further advantage of this invention is that the light produced may be of a desired shape to represent a vital part of the toy. The light may be employed to represent the eyes of a toy animal or the body of an insect such as a firefly. The light may be employed as a signal means in a toy apparatus. Further toy applications of the light produced by this invention may be in the form of toy ray guns, or toy laser beams.

The chemiluminescent light is produced in a pad or wick which has been moistened with a fluorescent chemical such as rubrene, or diphenylanthracene and on which a vapor has been sprayed. The vapor is formed in a squeeze bottle in which a solution of hydrogen peroxide in dimethylphthalate is activated by a small quantity of dinitrophenyl oxalate ester.

The color of the cold light produced is determined by the specific fluorescent chemical used or the color of the enclosing transparent tube. The device may be arranged so that external manual pressure applied to the squeeze bottle results in the mixing of the vapors and the production of the cold light, while release of the squeeze bottle results in discontinuance of the light.

The concentration of 5×10^{-4} moles of fluorescence per liter of dimethylphthalate is used on the wick in the preferred embodiment. A concentration of 0.05 moles per liter of hydrogen peroxide per liter is prepared from 90 percent hydrogen peroxide in dimethylphthalate and then dried over anhydrous magnesium sulfate powder for several hours prior to use. The dinitrophenyl oxalate ester is kept dry until used.

BRIEF DESCRIPTION OF THE DRAWING

The object and features of the invention may be understood with reference to the following detailed description of an illustrative embodiment of the invention, taken together with the accompanying drawing in which:

FIG. 1 is a cross-section in elevation of the apparatus;
FIG. 2 is a cross-section taken at line 2—2 of FIG. 1;
FIG. 3 is a cross-section taken at line 3—3 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now descriptively to the drawing, in which similar reference characters denote similar elements throughout the several views, FIG. 1 illustrates the apparatus for producing chemiluminescent light in a wad 10 of cotton which has been soaked in a solution of a fluorescent chemical. The wad 10 is enclosed at the end of a cylindrical tube 17 in a concave cup 14 with a transparent end housing 13 through which the cold

light produced is visible. End housing 13 may be located in an animal toy so as to simulate the eye of the toy animal.

The reactive vapor 48 is produced in bottle 40 by a solution 43 of hydrogen peroxide in dimethylphthalate which is activated by a small quantity of dinitrophenyl oxalate ester 44. Compression of flexible bulb 41 forces air through tube 45 into the solution 43 resulting in evaporated gas vapor 48 being produced in the air space of bottle 40. This gas vapor 48 is forced, by the pressure produced by compressing the flexible bulb 41, through tube 26 into tube 22 and through orifice 15 which is capped by the wad 10 soaked in the fluorescent material.

Air pressure is relieved, in the compartment in which the wad 10 is located, by perforations 11 and 21 in the concave cup 14 which lead the air through the outer tubular section 16 of cylindrical tube 17 and through perforations 31 in the end cap 20 of cylindrical tube 17.

Where the cold light is desired in the form of a ray as in a toy laser gun, the wad of cotton may be wrapped in the form of a filament 12 inside the tube 22 about a length of aluminum foil.

Since obvious changes may be made in the specific embodiment of the invention described herein, it is indicated that all matter contained herein is intended as illustrative and not as limiting in scope.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A toy in which chemiluminescent light is produced to represent a source of light in the toy, said chemiluminescent light occurring when a flexible squeeze bulb attached to a bottle is compressed to force the reactant vapors in said bottle into contact with a wad of porous material which is soaked with a fluorescent chemical, the gas space of said squeeze bottle being connected by tubing to the transparent container in which the wad of porous material is located.

2. The combination recited in claim 1 in which the container holding the wad of porous material soaked with a fluorescer is vented into a cylindrical tube.

3. The combination recited in claim 2 in which the said cylindrical tube is vented to the atmosphere at a distance from the vent leading to the wad containing the fluorescent chemical.

4. The combination recited in claim 1 in which the wad of porous material is in filament form and is wrapped about a length of aluminum foil so as to produce a linear ray of cold light when the squeeze bulb is compressed.

5. The combination recited in claim 1 in which the cold light produced represents the eye of a toy animal.

6. The combination recited in claim 4 in which the cold light produced represents the ray of a toy laser beam.

7. The combination recited in claim 1 in which the cold light produced is extinguished when the squeeze bulb is released.

* * * * *