

SPECIFICATION

A toy including a light emissive eye

- 5 This invention relates to a toy including a light emissive eye.

According to this invention, there is provided a toy including: a light emissive eye, which eye comprises a plurality of light emission diodes, arranged within an outline defining the pupil of the eye; electrical switch means; and an electrical power source, the said switch means being connected between the power source and the said diodes for causing the emission of light by operation of the said switch means, in which toy the said diodes are arranged in groups with each group comprising a plurality of light emission diodes which emit light of a colour different from the other groups and the said electrical switch means includes a plurality of individual switch means, arranged at different parts respectively of the body of the toy, each for activating the diodes of an associated one of the groups of diodes, whereby operating any one of the said individual switch means activates the diodes of the associated one of the groups of diodes.

The said outline defining the pupil of the eye could be within a portion defining the white of the eye to make up the eye-ball of the eye, the eye further including a transparent cover over the said groups of diodes and the said portion.

For at least one of the said groups of diodes, the associated individual switch means could comprise a respective pressure-operable switch, there being, at a location different from this switch, a further pressure-operable switch which may be operated to de-activate the associated group of diodes if the first-mentioned switch has been operated to activate the group of diodes, the first-mentioned switch being operable by a pressure of a magnitude which is different from that needed to operate the further switch.

Each of the plurality of individual switch means could comprise an individual pressure-operable switch, at least one of these switches being operable by a pressure which is different from the pressure needed to operate the or each other of these switches.

There could be, for at least one of the plurality of individual switch means, a coil connected therewith and having first and second switches which close if the coil is energised, the arrangement being such that, in response to operation of the individual switch means, the coil is energised, one of the first and second switches of the coil being connected to maintain energisation of the coil when closed despite cessation of operation of the individual switch means and the other of the first and second switches of the coil activating the associated group of diodes when closed.

60 The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a toy duck provided with light emissive eyes;

65 Figure 2 is a perspective magnified view of an eye

of the toy duck shown in Figure 1; and

Figures 3 and 4 show diagrams of electrical circuitry for the toy duck shown in Figure 1.

Referring to Figure 1, the toy duck shown in one manufactured after the manner of a caricatured duck, using conventional electromotive, mechanical and/or manual toy manufacturing techniques.

Referring to Figure 2, the eye shown comprises an eye-ball 2 and a transparent cover 1, for protecting the eye-ball 2. The eye-ball 2 may be movable or fixed and comprises a pupil 3 and a portion 4 surrounding the pupil 3 like the white of an ordinary eye. The pupil 3 comprises, within an outline defining the pupil, groups of light emission diodes (LED's) such as groups LED1, LED2 and LED3 (see Figure 3). When activated, the diodes of each group emit light of a colour respective to the group, such as red for group LED1, green for group LED2 and yellow for group LED3. Thus, the pupil 3 comprises, for example, a red light emission diode group, a green light emission diode group and a yellow light emission diode group, the groups being regularly interspersed in the pupil 3.

Referring to Figures 3 and 4, light emission diode groups LED1, LED2 and LED3 are connected in electrical circuitry including a switch S_s , touch control switches S_{41} and S_{21} , magnetic switches S_{11} , S_{12} , S_{13} and S_{31} , a source V and a resistance R. Individual light emission diodes of the light emission diode groups LED1, LED2 and LED3 are conventional light emission diodes. For example, if light emission diodes are used which are energised at a voltage of 2.5 volts (in the range from 2.0 to 2.8 volts), it is convenient that source V is a 3 volt battery, its voltage being dropped by the resistance R of an appropriate value. The battery V may be inserted in the body of the toy duck through an opening provided on the body such that the battery V is interchangeably housed therein. A lid 5 (see Figure 1) is fitted to the body to cover this opening.

Assuming that the light emission diode group LED1 is capable of emitting red light, the group LED1 is energised to emit red light immediately after the switch S_s and the magnetic switch S_{11} are closed. The magnetic switch S_{11} is operated in association with the touch control switch S_{21} (Figure 4). A plurality of switches similar to the switch S_{21} are used for respective ones of the other diode groups. The switch S_{21} and its equivalents are housed inside different soft portions respectively of the body of the toy duck and each may be operated by a blow given to the respective soft portion by a child playing with the toy duck, with displeasure, or a touch given thereto with affection. The red colour of light emitted by group LED1 is generally indicative of fury and, therefore, the switch S_{21} for activating the red light emission diode group LED1, should preferably have a greater gap or stroke such that the group LED1 will not emit a red light unless the soft portion of the body housing the switch S_{21} is subjected to a pressure exceeding a certain level, higher than that needed to operate the other touch control switches. Thus, the switch S_{21} will not be closed unless a higher pressure is applied, or greater blow is given, to the body of the toy duck. As can be seen from the



above, the emission of red light from the eyes of the toy duck can be effected separately from the emission of green or yellow light by the selection of a particularly switch. In the same manner, the emission of green light can be effected separately from that of yellow and red light by the touch control switch for the group LED2 being at a different location inside the body from the touch control switch for the group LED3 and the touch control switch S₂₁.

- 10 Referring to Figure 4, when the switch S₂₁ is closed, a coil C₁ is energised to close the magnetic switches S₁₁ and S₃₁, whereby red light emission diode group LED1 is energised to indicate fury, as long as the touch control switch S₁₁ (a "normally on" type switch) is not opened for an instant by the application of an external pressure thereto. If it is desired to stop the emission of red light, it is necessary to cut the electric current through coil C₁ by opening the switch S₁₁ for an instant by means of tenderly stroking the toy duck's head in which the switch S₁₁ is housed for example. The group LED1 is thus switched-off and the red light is extinguished. In a similar manner to the group LED1, the group LED2, for emitting green light, and group LED3, for emitting yellow light, are respectively arranged and, together with the group LED1 for emitting red light, thereby enable the eyes of the toy duck to appear angry, joyful, sad, etc.

It is, of course, possible to use circuitry which is adapted such that of two or more colours can be emitted at the same time.

- The power source for the circuitry can be one or more batteries, usually dry batteries, or a combination of an A.C. power source and a suitable commercial adapter instead.

CLAIMS

1. A toy including: a light emissive eye, which eye comprises a plurality of light emission diodes, arranged within an outline defining the pupil of the eye; electrical switch means; and an electrical power source, the said switch means being connected between the power source and the said diodes for causing the emission of light by operation of the said switch means, in which toy the said diodes are arranged in groups with each group comprising a plurality of light emission diodes which emit light of a colour different from the other groups and the said electrical switch means includes a plurality of individual switch means, arranged at different parts respectively of the body of the toy, each for activating the diodes of an associated one of the groups of diodes, whereby operating any one of the said individual switch means activates the diodes of the associated one of the groups of diodes.

2. A toy according to claim 1, wherein the said outline defining the pupil of the eye is within a portion defining the white of the eye to make up the eye-ball of the eye, the eye further including a transparent cover over the said groups of diodes and the said portion.

3. A toy according to claim 1 or 2, wherein, for at least one of the said groups of diodes, the associated individual switch means comprises a respective pressure-operable switch, there being, at a location different from this switch, a further pressure-

operable switch which may be operated to deactivate the associated group of diodes if the first-mentioned switch has been operated to activate the group of diodes, the first-mentioned switch being operable by a pressure of a magnitude which is different from that needed to operate the further switch.

4. A toy according to claim 3, wherein the further switch is operable by a pressure which is less than that needed to operate the first-mentioned switch.

5. A toy according to any preceding claim, wherein each of the plurality of individual switch means comprises an individual pressure-operable switch, at least one of these switches being operable by a pressure which is different from the pressure needed to operate the or each other of these switches.

6. A toy according to claim 5, wherein at least one of the individual pressure-operable switches is operable by a pressure which is greater than the pressure needed to operate the or each other of these switches.

7. A toy according to any preceding claim, including, for at least one of the plurality of, individual switch means, a coil connected therewith and having first and second switches which close if the coil is energised, the arrangement being such that, in response to operation of the individual switch means, the coil is energised, one of the first and second switches of the coil being connected to maintain energisation of the coil when closed despite cessation of operation of the individual switch means and the other of the first and second switches of the coil activating the associated group of diodes when closed.

8. A toy, substantially as herein described with reference to the accompanying drawings.

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- 10 Referring to Figure 4, when the switch S_{21} is closed, a coil C_1 is energised to close the magnetic switches S_{11} and S_{31} whereby red light emission diode group LED1 is energised to indicate fury, as long as the touch control switch S_{41} (a "normally on" type switch) is not opened for an instant by the application of an external pressure thereto. If it is desired to stop the emission of red light, it is necessary to cut the electric current through coil C_1 by opening the switch S_{41} for an instant by means of tenderly stroking the toy duck's head in which the switch S_{41} is housed for example. The group LED1 is thus switched-off and the red light is extinguished. In a similar manner to the group LED1, the group LED2, for emitting green light, and group LED3, for emitting yellow light, are respectively arranged and, together with the group LED1 for emitting red light, thereby enable the eyes of the toy duck to appear angry, joyful, sad, etc.

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3. A toy according to claim 1 or 2, wherein, for at least one of the said groups of diodes, the associated individual switch means comprises a respective pressure-operable switch, there being, at a location different from this switch, a further pressure-

operable switch which may be operated to deactivate the associated group of diodes if the first-mentioned switch has been operated to activate the group of diodes, the first-mentioned switch being operable by a pressure of a magnitude which is different from that needed to operate the further switch.

4. A toy according to claim 3, wherein the further switch is operable by a pressure which is less than that needed to operate the first-mentioned switch.

5. A toy according to any preceding claim, wherein each of the plurality of individual switch means comprises an individual pressure-operable switch, at least one of these switches being operable by a pressure which is different from the pressure needed to operate the or each other of these switches.

6. A toy according to claim 5, wherein at least one of the individual pressure-operable switches is operable by a pressure which is greater than the pressure needed to operate the or each other of these switches.

7. A toy according to any preceding claim, including, for at least one of the plurality of, individual switch means, a coil connected therewith and having first and second switches which close if the coil is energised, the arrangement being such that, in response to operation of the individual switch means, the coil is energised, one of the first and second switches of the coil being connected to maintain energisation of the coil when closed despite cessation of operation of the individual switch means and the other of the first and second switches of the coil activating the associated group of diodes when closed.

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