March 15, 1966 J. H. FORKNER 3,239,961

DOLL WITH ELECTRICAL ACTUATION

Filed April 2, 1963

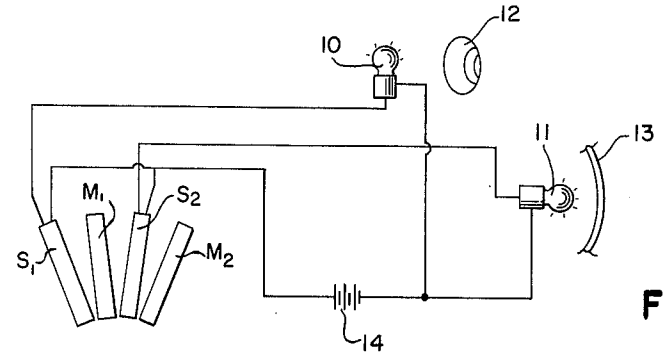


FIG. 1

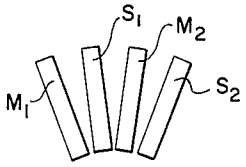


FIG. 2



FIG. 3

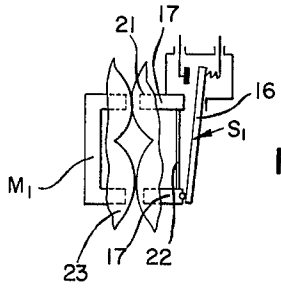


FIG. 4

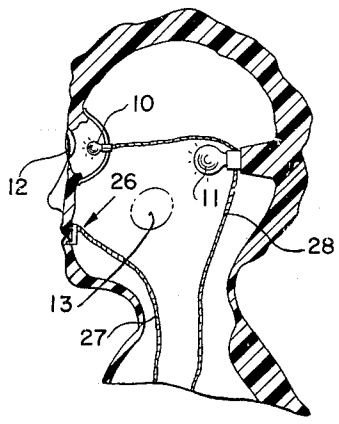


FIG. 5

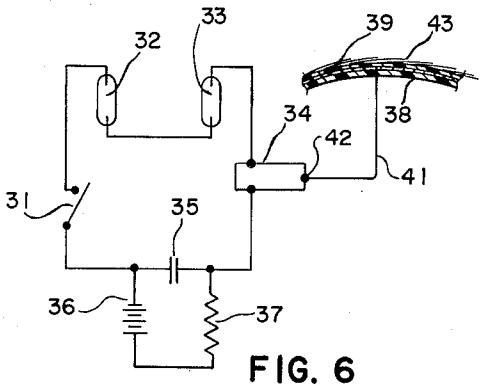


FIG. 6

INVENTOR.
JOHN H. FORKNER

BY Flehr and Swain

ATTORNEYS

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DOLL WITH ELECTRICAL ACTUATION

John H. Forkner, 6870 W. Herndon, Fresno, Calif.

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This invention relates generally to dolls of the type having one or more response devices adapted to be activated by application of an electrical current.

In general it is an object of the invention to provide a doll having novel realism in its responses.

Another object of the invention is to provide a doll which automatically effects a realistic response when another properly equipped doll is brought into its proximity.

Additional objects and features of the invention will appear from the following description in which the preferred embodiments have been set forth in detail in conjunction with the accompanying drawing.

Referring to the drawing:

FIGURE 1 is a schematic view with a circuit diagram illustrating one embodiment of my invention.

FIGURE 2 schematically illustrates a pattern of magnetic devices associated with another doll for operating the arrangement of FIGURE 1.

FIGURE 3 schematically illustrates how magnetic devices can be associated with the lip portions of a doll head.

FIGURE 4 is a detail in section likewise indicating how a magnetic switch can be associated with the lip portions.

FIGURE 5 illustrates a doll head in section, with the head being equipped with the arrangement illustrated in FIGURE 1.

FIGURE 6 schematically illustrates another embodiment of the invention.

It is old to provide dolls with various types of response devices to lend realism. For example, electric lamps have been associated with the eyes whereby when a concealed switch is manually operated, the eyes are illuminated or caused to blink. Also sound reproducing devices, operating from a sound record, have been employed with manual means for their operation. The present invention likewise uses one or more desired response devices, but these devices are actuated by electrical means including a magnetic switch which is mounted in such a fashion that it is sensitive to the approach of an external magnetic field. In the preferred embodiment described, a magnetic switch is located in the general region of the lip portions of the doll whereby when such region is contacted by a like region of another doll equipped with permanent magnet means, the switch is operated to activate the response device.

The arrangement schematically illustrated in FIGURE 1 consists of electric lamps **10** and **11** that are located within a doll head. Lamp **10** is positioned so that it illuminates the translucent eyes **12**, while lamp **11** illuminates wall portion or portions **13**, which are translucent. The portions **13** may, for example, correspond to the cheeks of the doll and the lamp **11** may provide a red light whereby the cheeks are caused to redden when the lamp is illuminated.

The lamps **10** and **11** are associated with magnetically operated switches **S1** and **S2**. The simple electrical circuitry between the switches **S1** and **S2** and the lamps **10** and **11**, is such that the terminals of switch **S1** are connected in series with the lamp **10** and the battery **14**. The terminals of switch **S2** likewise connect in series with the lamp **11** and the same battery **14**. Thus when the contacts of switch **S1** are closed, lamp **10** is illuminated, and when switch **S2** is closed, lamp **11** is illuminated.

In FIGURE 4 switch **S1** has been shown comprising the hinged magnetic armature **16**, associated with pole pieces

17 of magnetic material. The terminals connect respectively to a stationary contact, and a movable contact mounted upon the free end of the armature **16**. The pole pieces **17** are shown mounted in the lip portions **21** of the doll head, in such a manner that they are readily influenced by the presence of an adjacent exterior magnetic field.

Assuming that a plurality of magnetically operated switches are employed, together with two or more response devices, the switches can be grouped as shown in FIGURE 1. The intervening magnets **M1** and **M2** may be simple permanent magnets of the Alnico type. The fields of the magnets may be suitably shielded, whereby they do not affect the nearby switches **S1** and **S2**. Instead of or in addition to magnetic shielding, the switches **S1** and **S2** can be neutralized with respect to magnets **M1** and **M2**, by the use of a small permanent bridging magnet **22** between the pole pieces **17**, whereby in effect the magnetic field of an adjacent permanent magnet is neutralized, without however rendering the switch insensitive to an exterior magnetic field which is applied to the pole pieces **17**.

The exterior magnetic field is provided by another like doll, as indicated schematically in FIGURE 4. The lip portions **23** of this doll are provided with the permanent magnet **M1**, whereby when the lips of the two dolls are placed in proximity to simulate a kiss, the field of magnet **M1** serves to operate the switch **S1**, thus illuminating the light **10**. Assuming that the second doll has only a single permanent magnet, then there must be some shift in the positioning of the lips to bring the field of this magnet into cooperative position with either one of the two switches **S1** and **S2**.

Preferably the second doll is provided with two magnets **M1** and **M2**, as shown schematically in FIGURE 2, whereby in one positioning of the second doll with respect to the first, the field of both magnets **M1** and **M2** can be caused to operate the switches **S1** and **S2**, thus illuminating both the lights **10** and **11**. Here again however by shifting one doll with respect to the other, the responses can be provided separately. Again as indicated in FIGURE 2, the second doll may be provided with both the magnets **M1** and **M2**, and the switches **S1** and **S2**, all in a pattern similar to that in the first doll. The second doll is provided with response devices and circuitry, which may be the same as in the first doll. It will be evident that with this arrangement of two dolls, the responses will vary depending upon the positioning between the dolls, whereby both lights can be illuminated in each doll, or the lamps illuminated separately.

While in the foregoing I have referred to the use of electric lamps for obtaining desired responses, it will be appreciated that other types of response devices can be used, which are either directly actuated, or driven by motor means which can be initiated into operation by application of an electrical current. For example sound reproducing devices can be employed, which are either directly operated by an electrical motor, or which have manually wound spring means released by application of an electrical current.

FIGURE 5 illustrates a complete head which is equipped with magnetically operated switches and magnets and lights **10** and **11**. The light **10** (or two lights if desired), shines upon the back sides of the translucent eyes **12**. The light **11** is arranged generally to illuminate the interior of the head, and illuminates the translucent cheek portions **13**, which are either thinner than the remainder of the head walls, or made of more translucent material. The switches and electromagnets are indicated generally at **26**, and are set into the lip portions in the manner previously described. The flexible electrical con-

ductors 27 and 28 extend down into the body of the doll for connection with a suitable battery.

FIGURE 6 schematically illustrates an embodiment in which certain electrostatic effects are obtained when a magnetic switch is closed. Thus in this instance a magnetically operated switch 31, which may be located and operated in the manners previously described, is connected in series with a circuit including the two glow discharge tubes 32 and 33, the voltage transformer 34 and the condenser 35. A small battery 36, of the multiple cell type, is connected across the condenser 35 in series with the resistor 37. Assuming that the voltage of the battery 36 is properly selected with relation to the capacity of condenser 35 and the value of resistor 37, such circuit functions are as follows. The battery 36 maintains the condenser 35 charged, by virtue of current supplied through the resistor 37. When the switch 31 is closed, currents surging from the condenser 35 passes through the glow discharge tubes 32 and 33 whereby these tubes are flashed. Tubes 32 and 33 are automatically extinguished because of the relatively high value of the resistor 37. Immediately after tubes 32 and 33 have flashed, recharging of condenser 35 commences and continues until completed.

Member 38 represents a portion of a doll head which is made of suitable dielectric material, such as molded synthetic resins. A metallic electrode 39 is embedded within the head portion 38 and is connected by conductor 41 to the high voltage terminal of the voltage transformer 42. The other terminal of the high voltage transformer 42 is assumed to be electrostatically grounded. As indicated at 43, the head of the doll is provided with hair made of natural or synthetic filaments capable of taking an electrostatic charge.

Operation of the embodiment shown in FIGURE 6 is as follows. The glow discharge tubes 32 and 33 take the place of the lamps 10 of FIGURE 5 and are mounted in conjunction with the eyes of the doll. When the switch 31 is momentarily closed, the eyes of the doll are flashed and at the same time a high voltage pulse of negligible current value is applied to the electrode 39, thereby causing the filaments of the hair to assume an electrostatic charge. This serves to cause the filaments of hair to repel each other and to give the appearance of "standing on end." The charge can be dissipated as by contacting the hair with the hand.

In place of the simple circuitry shown in FIGURE 6, known types of transistor circuitry can be used for the same purpose. For example, I can use the circuitry disclosed in Root 2,829,257, by inserting a suitable switch in series with the energizing battery, together with a voltage transformer corresponding to the transformer 34.

When an arrangement such as shown in FIGURE 6 is employed to obtain an electrostatic effect on the hair, the doll can be supplied with a condition whereby the electrostatic properties can be temporarily modified. The condition may, for example, be a simple aqueous liquid which is non-toxic and which can be appled to the har like a "hair oil," with brushing or combing to reduce its electrostatic properties, thus permitting the hair to be groomed as desired. When the liquid evaporates, the electrostatic properties are restored. Also I may supply combs or brushes made of metal or metalized, whereby when applied to the hair a static charge is removed. Other conditions may increase the electrostatic effect, such as resin powders and the like.

Although the foregoing description refers to dolls that simulate human beings, it is to be understood that the features of my invention can be applied to various figurines, such as figures of animals and the like.

I claim:

1. In a doll, a structure forming a doll figure with a head having lip portions, a magnetic switch concealed within the head and associated with the general region of the lip portions, said switch including magnetic pole means extending in proximity with the exterior surfaces of the lips and being operated by proximity of an external magnetic field adjacent said region, a response device within the doll structure, and electric circuit means including a source of current serving to connect the switch means with the response device whereby when a magnetic field is located in proximity with said region of the head, said switch is operated to activate the response device.

2. A doll as in claim 1 in which said pole means includes two spaced magnetic poles, one pole being disposed within each of the two lips of the head.

3. A doll as in claim 1 in which two of said magnetic switches are provided, the pole means of both said switches being disposed within the lip portions, together with at least two response devices adapted to afford different responses, and circuit means including a source of current serving to connect the two switch means with the two response devices, whereby said response devices are selectively activated when a magnetic field is located in proximity with the pole means of a particular switch.

4. A doll as in claim 3 in which the response means consists of electric lamps disposed to illuminate different portions of the doll head.

5. A doll as in claim 3 together with at least one permanent magnet having pole means located within the lip portions, said permanent magnet supplying a magnetic field for the operation of a like doll.

6. In a doll, a structure forming a figure with a head, magnetic switch concealed within the figure, said switch having magnetic pole means adjacent but covered by one exterior surface area of the structure and having contacts within the figure operated by proximity of an exterior magnetic field, said magnetic pole means also being located in the general region of the lip portions of the doll head, a response device within the doll structure, and electrical circuit means including a source of current serving to connect the switch means with the response device whereby when a magnetic field is located in proximity with said pole means said switch is operated to close said contacts to activate the response device.

7. A doll as in claim 6 in which the doll includes hair-like filaments having electrostatic properties and the response device applies an electrostatic charge to the filaments.

8. A doll as in claim 6 in which a plurality of said magnetic switches are provided with the magnetic pole pieces of the same disposed in one general area, and in which a plurality of response devices are provided, together with a plurality of circuits connected between the respective contacts of the switch means and the response devices, whereby said response devices are selectively activated by operation of said switch means.

9. A doll as in claim 6 in which a plurality of said magnetic switches are provided, with the magnetic pole means thereof located in the lip portions of the doll head, and in which a plurality of response devices are provided together with a plurality of circuit means connecting said contacts of said switch means with said response devices, each of said response devices affording a different response.

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DELBERT B. LOWE, *Primary Examiner.*

RICHARD C. PINKHAM, *Examiner.*