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(54) **SOUND PRODUCING DOLL HAVING BABBLING SOUND**

GERÄUSCHPRODUZIERENDE PUPPE MIT PLAPPERNDEM GERÄUSCH

POUPEE EMETTANT UN SON DE BABILLAGE

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EP 1 117 465 B1

Description

Field of the Invention

[0001] This invention relates generally to dolls and toy figures and particularly to those utilizing sound producing apparatus.

Background of the Invention

[0002] Dolls have been popular with young children throughout recorded history. Perhaps, the first dolls fabricated were crudely shaped by humans for personal use at a time when human civilization was relatively unsophisticated. Within modern times, dolls have proven to be an extremely popular and lucrative line of toy products for practitioners in the art. Notsurprisingly, practitioners in the art have responded to this long term popularity by providing a virtually endless variety of dolls. While such variety defies classification of different doll types, all may be generally described as either soft body or so-called "plush" dolls versus hard plastic dolls such as the ever popular fashion dolls. Dolls also may be generally classified as to size ranging from smaller dolls which tend to be hard plastic to large dolls often depicting human infants or other characters in a fanciful appearance. Dolls have also been provided which are animal like rather than human like and have been provided to mimic different ages ranging from infant to adult appearances.

[0003] Amid all the various dolls provided by practitioners thus far, the advent of sound systems which may be fitted within a doll torso has prompted practitioners in the art to add the feature of sound generation to various dolls. Thus, dolls have been provided which perform sound features such as speaking, crying, laughing, and singing as well as other sounds appropriate to the doll.

[0004] U.S. Patent 5,282,180 issued to Lam, et al. sets forth a TOY DOLL HAVING SOUND GENERATOR WITH OPTICAL SENSOR AND PRESSURE SWITCHES having a torso within which a sound circuit is supported. A first pressure-actuated switch is positioned in the doll's torso while a second pressure-actuated switch also located in the doll's torso provide two different sound outputs in response to triggering each switch. An optical sensor is supported in the mouth of the doll and connected to an integrated circuit located in the torso of the doll. In response to variations of light sensed, the sound circuit produces either laughing or crying.

[0005] U.S. Patents 4,659,919 issued to Price setting forth an OPTICAL SENSING CIRCUIT FOR AUDIO ACTIVATION OF TOYS and 4,675,519 issued to Price and setting forth a TOY HAVING OPTICALLY ACTUATED SOUND GENERATOR set forth a doll having a sound producing circuit therein together with a pair of optical sensors supported in the doll's eyes. The internal circuit includes a comparator for comparing the output of each optical sensor. The sound producing circuit is differentially triggered by the optical sensors.

[0006] U.S. Patent 5,501,627 issued to Ekstein sets forth a CHILDREN'S TOY WITH PEEK-A-BOO ACTIVATION having a pair of optical sensors coupled to a speech trigger circuit which in turn controls a speech synthesizer.

The speech trigger circuit is configured to respond to the relative changes of sensor output characteristic of a head moving in a peek-a-boo fashion with respect to the doll.

[0007] U.S. Patent 5,096,451 issued to Smith, et al. sets forth a TOY MERMAID WITH VOICE UNIT having a body shaped to depict the body of a mermaid, a head, the body and head having generally hollow interiors. Apparatus positioned within the body and the head for providing sound is responsive to an apparatus for initiating sound creation.

[0008] U.S. Patent 5,695,381 issued to Truchsess sets forth a TOY FIGURE WITH RUMP-ACTUATED SOUND GENERATOR having a doll body supporting arm and leg appendages and having a sound producing circuit within the doll body. A trigger switch is positioned at the lower torso or rump of the doll body and operates when the doll is "bounced" upon the user's knee to activate the sound circuit and produce audible sound.

[0009] U.S. Patent 5,324,225 issued to Satoh, et al. sets forth an INTERACTIVE TOY FIGURE WITH SOUND ACTIVATED AND PRESSURE ACTIVATED SWITCHES having a body resembling a small kitten within which a housing supports a motor operatively coupled to the tail of the figure for movement. A sound circuit is also utilized within the figure's body.

[0010] U.S. Patent 4,973,941 issued to Davis, et al. sets forth an ELECTRONIC SOUND GENERATING DEVICE supported within a disk-like housing and having an upper push button actuating switch.

[0011] U.S. Patent 4,810,997 issued to Kudo, et al. sets forth a SMALL SOUND GENERATING DEVICE similar to that set forth in U.S. Patent 4,973,941.

[0012] U.S. Patent 4,820,236 issued to Berliner, et al. sets forth a DOLL WITH SENSING SWITCH having a piezoelectric element which produces an output signal when the doll supporting the element is squeezed or distorted.

[0013] U.S. Patent 5,471,192 issued to Dash sets forth a SOUND-PRODUCING DEVICE STIMULATED BY PETTING having a soft bodied doll supporting a pressure responsive switch and a battery-powered electronic sound circuit such that petting the doll energizes the sound circuit and produces output sound.

[0014] While the foregoing described prior art devices have improved in the art and in some instances enjoyed commercial success, there remains nonetheless a continuing need in the art for evermore improved, interesting and amusing sound producing dolls.

Summary of the Invention

[0015] Accordingly, it is a general object of the present invention to provide an improved sound producing doll. It is a more particular object of the present invention to

provide an improved sound-producing doll which creates a novel sound response to rapid finger movement about the doll's lips.

[0016] In accordance with the present invention, there is provided a doll comprising: a doll body having a torso, a head, a pair of arms and hands and a pair of legs, the head defining a mouth having a light-transmissive portion formed therein; a light sensor supported in proximity to the light-transmissive portion producing a light intensity dependent signal; a sound circuit supported within the body having a processor and a memory operative to produce audio signals from stored audio data stored in the memory and having a first switch and a second switch selecting the audio data; and a transducer coupled to the sound circuit converting the audio signals to audible sound, the sound circuit responding to a rapidly varying level of said light intensity dependent signal when the user moves a finger back and forth in front of the mouth to impose a distortion on the signal to cause the doll to audiblize a babbling distorted version of the audible output of the sound circuit.

Brief Description of the Drawings

[0017] The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

Figure 1 sets forth a front perspective view of a doll constructed in accordance with the present invention;

Figure 2 sets forth a partial section view of the operative mechanism within the present invention doll; and

Figure 3 sets forth a block diagram of the electronic portion of the present invention sound producing doll.

Description of the Preferred Embodiment

[0018] Figure 1 sets forth a front perspective view of a doll constructed in accordance with the present invention and generally referenced by numeral 10. Doll 10 includes a body 11 having a torso 12 supported by a pair of legs 13 and 14. Torso 12 further supports a pair of arms 15 and 16 as well as a head 20. Head 20 is supported upon a neck 17. Head 20 further defines a facial portion having a mouth 21 formed thereon. Mouth 21 includes a light-transmissive portion 22 at the approximate center of the mouth. Light-transmissive portion 22 is preferably formed of a plastic material which is molded along with head 20 but which defines a substantially thinner portion

of head 20. Thus, in the preferred fabrication of the present invention, head 20 is formed of a relatively thick molded plastic material which is generally opaque while light-transmissive portion 22 though formed of the same material is partially light-transmissive due to the reduced thickness of the material at that point within mouth 21. Arm 15 further supports a switch 55 actuatable by squeezing arm 15. In addition, a housing 30 (seen in Figure 2) is supported within torso 11 and extends upwardly through neck 17 to the interior of head 20 as is also shown in Figure 2. Housing 30 further supports a torso switch 67 (seen in Figure 2). Thus, torso switch 67 is actuated by the user simply squeezing inwardly on torso 12.

[0019] In accordance with the present invention and by means set forth below in greater detail, doll 10 produces audible sounds in response to actuation of switch 55 and switch 67. In further accordance with the present invention, the sound output of doll 10 is converted to a babbling sound when the user places finger 23 overlying mouth 21 and moves rapidly up and down in the region of mouth 21 as indicated by arrows 24 and 25. In the preferred fabrication of the present invention, the sound produced by doll 10 under such circumstances corresponds to the sound often made by young children as a single tone is audiblized and the child manipulates a finger back and forth across the lips and mouth opening. For lack of a better term, this sound is referred to herein as "babbling".

[0020] Figure 2 sets forth a partial section side view of the operative mechanism within doll 10. As described above, doll 10, which is shown partially in section and partially in dashed-line, includes a body 11 having a torso 12 and supporting a neck 17. A head 20 is supported upon neck 17. Head 20 defines a mouth portion 21 and a light-transmissive portion 22.

[0021] In accordance with the present invention, a housing 30 is supported within torso 12 and extends upwardly into head 20 through neck 17. Conventional support means are provided in the area of neck 17 upon body 11 to secure housing 30 (support means not shown). Housing 30 further includes an interior cavity 31, a battery supply 65, a torso switch 67 and an on/off switch 66. A conventional speaker 64 is supported within interior cavity 31 in accordance with conventional fabrication techniques.

[0022] Housing 30 further supports a housing 50 having a cone-shaped portion 54. Cone-shaped portion 54 extends through aperture 56 formed in housing 30 and terminates in an aperture 57. A phototransistor 44 is supported within aperture 57 against light-transmissive portion 22 of mouth 21 within cone 54. An elongated brace 45 defines a tapered end 51 which is received within cone-shaped portion 54 and which applies a retaining force against photo-transistor 44. A recess 46 receives a spring 47 which provides a force against brace 45 to maintain the position shown and captivate phototransistor 44. Phototransistor 44 is constructed in accordance

with conventional fabrication techniques.

[0023] A sound circuit 40 includes a printed circuit board 41 supporting a plurality of conventional electronic components such as components such as components 43. Housing 30 forms a pair of grooves 33 and 34 which receive the outer ends of printed circuit board 41 to secure it in place. A pair of wires 60 are coupled between circuit 40 and phototransistor wires 52 and 53 to operatively coupled phototransistor 44 to circuit 40. An additional pair of conductive wires 62 couples circuit 40 to speaker 64 and a pair of wires 61 couples arm switch 15 (seen in Figure 1) to circuit 40. Finally, a pair of wires 63 couples switch 67 to circuit 40.

[0024] Circuit 40 further includes an automatic gain control system 32 which is constructed in accordance with conventional fabrication techniques and which controls the trigger level of phototransistor 44.

[0025] In operation, the user activates doll 10 by turning on/off switch 66 to the on position shown in Figure 2 which in turn couples the electrical energy of battery 65 to circuit 40. Thereafter, circuit 40 may be energized by the user squeezing either switch 67 in torso 12 or switch 55 in arm 15 (seen in Figure 1). In either event, circuit 40 responds to the activation of switch 55 or switch 67 to audibilize a selected one of a plurality of sound messages stored within circuit 40. Circuit 40 is a circuit of the type often referred to as speech circuit or sound circuit and is fabricated in accordance with conventional fabrication techniques and utilizes an internal memory having stored audio data thereon and a microprocessor having a stored instruction set and the stored memory data are utilized by the microprocessor to provide sound signal output. It will be well understood by those skilled in the art that virtually any standard speech circuit may be utilized in place of circuit 40 without departing from the spirit and scope of the present invention. The essential characteristic of circuit 40 is the provision of appropriate signals to speaker 64 for audibilizing a predetermined speech message or sound combination each time a particular switch is pressed. For example, a combination of a microprocessor, read only memory, speech synthesizer and audio output amplifier suitable for the functioning of circuit 40 is formed as a single integrated circuit chip device manufactured by Texas Instruments, Inc. under the device name TMS50C44. However, it will be understood that a variety of standard integrated circuit devices may be utilized for circuit 40.

[0026] Thus, with circuit 40 actuated by squeezing of either switch 55 or switch 67, circuit 40 outputs a selected audio signal at connecting wires 62 which is directed outwardly from speaker 64. In further accordance with the present invention, automatic gain control 42 is entirely conventional in fabrication and is operative to adjust phototransistor 44 to ambient light conditions in the region of mouth 21. Thus, in the event doll 10 is placed in a somewhat darkened environment, the output of phototransistor 44 senses this darkened environment and produces an output signal which is read by automatic

gain control circuit 42 which in turn adjusts the point at which circuit 40 responds to changes of light at phototransistor 44. Conversely, in high ambient light conditions, a reverse setting is made by automatic gain control circuit 42. Thus, the use of an automatic gain control circuit in combination with circuit 40 allows adjustment for ambient light conditions.

[0027] In further accordance with the present invention once circuit 40 has been triggered by switch 55 or switch 67, the user may modulate or superimpose a babbling sound for doll 10 by placing the user's fingertip back and forth across mouth 21 as illustrated in Figure 1. The effect of this movement back and forth causes a relatively fast variation of the light applied to phototransistor 44 through light transmissive portion 22 which in turn modulates the audio signal output of circuit 40. In the preferred fabrication of the present invention, this modulation is a distortion of the speech or other audio output being produced by circuit 40 such that the character of the sound is a combination of the original message and the modulation.

[0028] Figure 3 sets forth a block diagram of sound circuit 40. As mentioned above, sound circuit 40 includes a microprocessor 70 having an associated memory 71. Memory 71 will be understood to store audio data utilized by processor 70 in formulating audio signals together with a stored instruction set which is utilized by microprocessor 70 in responding to inputs from other selection circuitry and circuit elements. A light sensor 44, which in the preferred embodiment of the present invention includes phototransistor 44, is operatively coupled to microprocessor 70. An automatic gain control 42 is operative upon the output of light sensor 44 to provide the above-described ambient light adjustment for the light sensor. A hand switch 55 and a torso switch 67 are coupled to selection inputs of microprocessor 70. An audio amplifier 72 couples the audio output of microprocessor 70 to a speaker 64.

[0029] Thus, microprocessor 70 operates in accordance with conventional fabrication techniques in response to inputs from switch 55 or switch 67 to select a speech output or song output or other previously stored sound for playing through audio amplifier 72 and speaker 64. In accordance with the present invention, the output of light sensor 44 is operative upon microprocessor 70 to cause microprocessor 70 to modulate or composite the selected audio signal with a babbling distortion. As a result and in accordance with an important aspect of the present invention, the initiation of the babbling sound by finger motion across the mouth of the doll as shown in Figure 1 results in a distorted babbling sound which is still recognizable as the originally selected sound message. This is accomplished by simple modulation within microprocessor 70.

[0030] While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim in the appended

claims is to cover all such changes and modifications as fall within the scope of the invention, as defined in the appended claims.

Claims

1. A doll (10) comprising:

a doll body (11) having a torso (12), a head (20), a pair of arms (15) and hands and a pair of legs, said head defining a mouth (21) having a light-transmissive portion (22) formed therein; a light sensor (44) supported in proximity to said light-transmissive portion producing a light intensity dependent signal; a sound circuit (40) supported within said body having a processor and a memory operative to produce audio signals from stored audio data stored in said memory and having a first switch (55) and a second switch (67) selecting said audio data; and a transducer (72) coupled to said sound circuit converting said audio signals to audible sound,

characterised in that,

said sound circuit responds to a rapidly varying level of said light intensity dependent signal when the user moves a finger back and forth in front of said mouth to impose a distortion on said signal to cause said doll to audiblize a babbling distorted version of the audible output of said sound circuit.

2. The doll set forth in claim 1 wherein said sound circuit (40) includes an automatic gain control operative upon said light intensity dependent signal.

3. The doll set forth in claim 2 wherein said light sensor (44) is a phototransistor.

4. The doll set forth in claim 3 wherein said first and second switches (55, 67) are supported within said torso and said hand respectively.

Revendications

1. Poupée (10) comprenant :

un corps de poupée (11) ayant un torse (12), une tête (20), une paire de bras (15) et de mains et une paire de jambes, la dite tête définissant une bouche (21) dans laquelle est formée une partie transmettant la lumière (22) ; un détecteur de lumière (44) supporté à proximité de la dite partie transmettant la lumière et produisant un signal dépendant de l'intensité de la lumière ;

un circuit de son (40) supporté à l'intérieur du dit corps, ayant un processeur et une mémoire servant à produire des signaux audio à partir de données audio stockées dans la dite mémoire, et ayant un premier commutateur (55) et un deuxième commutateur (67) de sélection des dites données audio ; et un transducteur (72) couplé au dit circuit de son pour convertir les dits signaux audio en un son audible ;

caractérisée en ce que

le dit circuit de son répond à un niveau rapidement variable du dit signal dépendant de l'intensité de lumière lorsque l'utilisateur déplace un doigt en va-et-vient devant la dite bouche, de manière à créer une distorsion du dit signal afin que la dite poupée émette une version déformée de babillage audible de la sortie audible du dit circuit de son.

2. Poupée selon la revendication 1, dans laquelle le dit circuit de son (40) comprend une commande de gain automatique agissant sur le dit signal dépendant de l'intensité de la lumière.

3. Poupée selon la revendication 2, dans laquelle le dit détecteur de lumière (44) est un phototransistor.

4. Poupée selon la revendication 3, dans laquelle les dits premier et deuxième commutateurs (55, 67) sont supportés à l'intérieur du dit torse et de la dite main respectivement.

Patentansprüche

1. Puppe (10), umfassend:

- einen Puppenkörper (11) mit einem Rumpf (12), einem Kopf (20), einem Paar Arme (15) und Hände (21) sowie einem Paar Beine, wobei der Kopf einen Mund (21) mit einem darin ausgebildeten lichtdurchlässigen Bereich (22) aufweist;
- einen Lichtsensor (44), der nahe des lichtdurchlässigen Bereichs angebracht ist und der ein von der Lichtstärke abhängiges Signal erzeugt;
- einen Klangschatzkreis (40), der in dem Körper untergebracht ist, einen Prozessor sowie einen Speicher aufweist, die eine Erzeugung von Audio-Signalen aus in dem Speicher gespeicherten Audio-Daten bewirken, und der einen ersten Schalter (55) sowie einen zweiten Schalter (67) zur Auswahl der Audio-Daten umfasst; und
- einen Wandler (72), der mit dem Klangschatzkreis verbunden ist und die AudioSignale in hörbare Töne umwandelt,

dadurch gekennzeichnet, dass

der Klangs Schaltkreis auf ein sich schnell änderndes Niveau des von der Lichtstärke abhängigen Signals anspricht, wenn der Benutzer zum Aufbringen einer Verzerrung auf das Signal vor dem Mund einen Finger vor und zurück bewegt, um die Puppe dazu zu veranlassen, eine brabbelnd verzerrte Version der Tonausgabe des Klangs Schaltkreises hörbar zu machen.

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2. Puppe nach Anspruch 1,**dadurch gekennzeichnet, dass**

der Klangs Schaltkreis (40) eine automatische Verstärkungsregelung umfasst, die auf das von der Lichtstärke abhängige Signal wirkt.

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3. Puppe nach Anspruch 2,**dadurch gekennzeichnet, dass**

es sich bei dem Lichtsensor (44) um einen Phototransistor handelt.

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4. Puppe nach Anspruch 3,**dadurch gekennzeichnet, dass**

der erste und der zweite Schalter (55, 67) in dem Rumpf bzw. in der Hand untergebracht sind.

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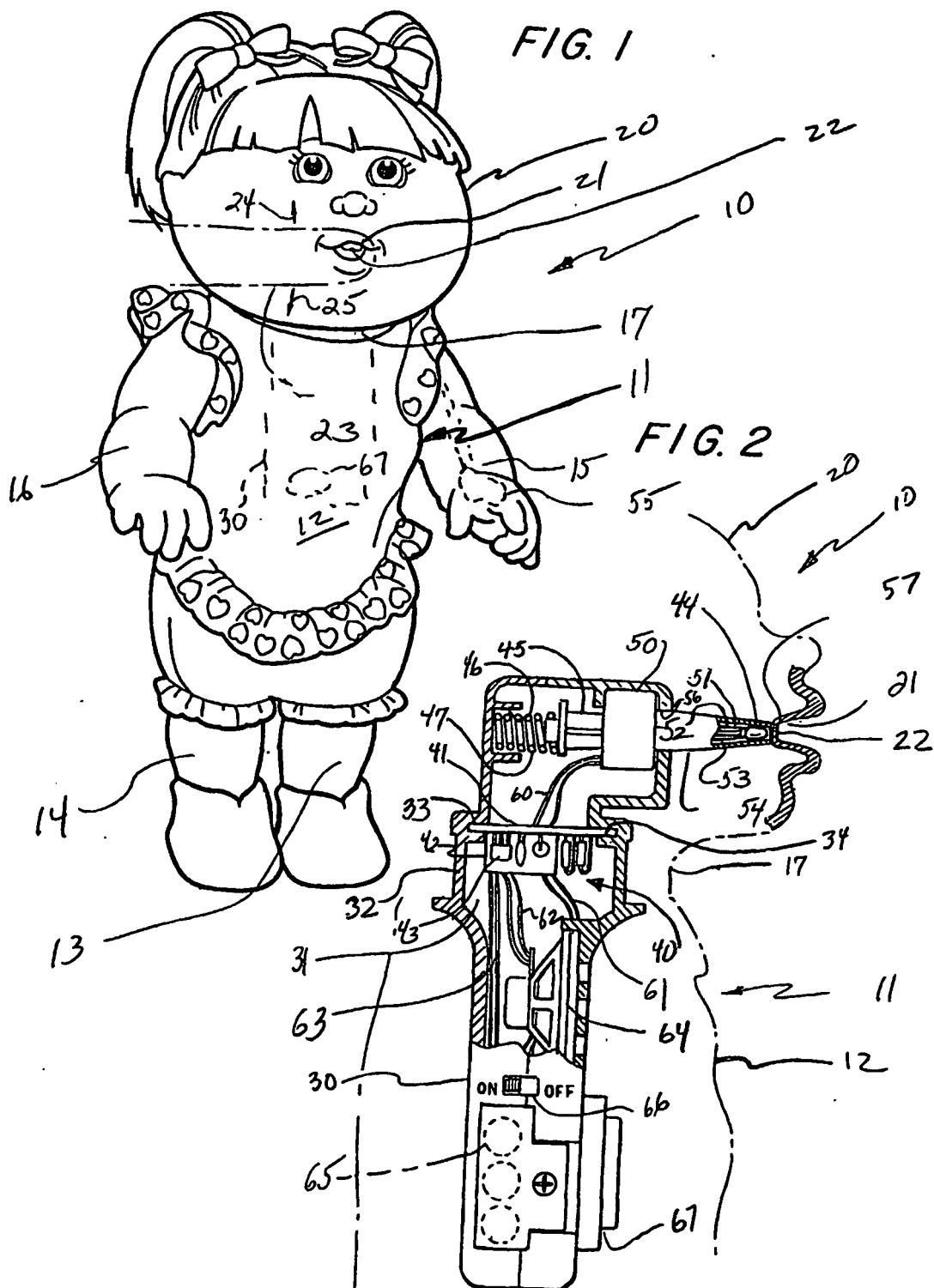
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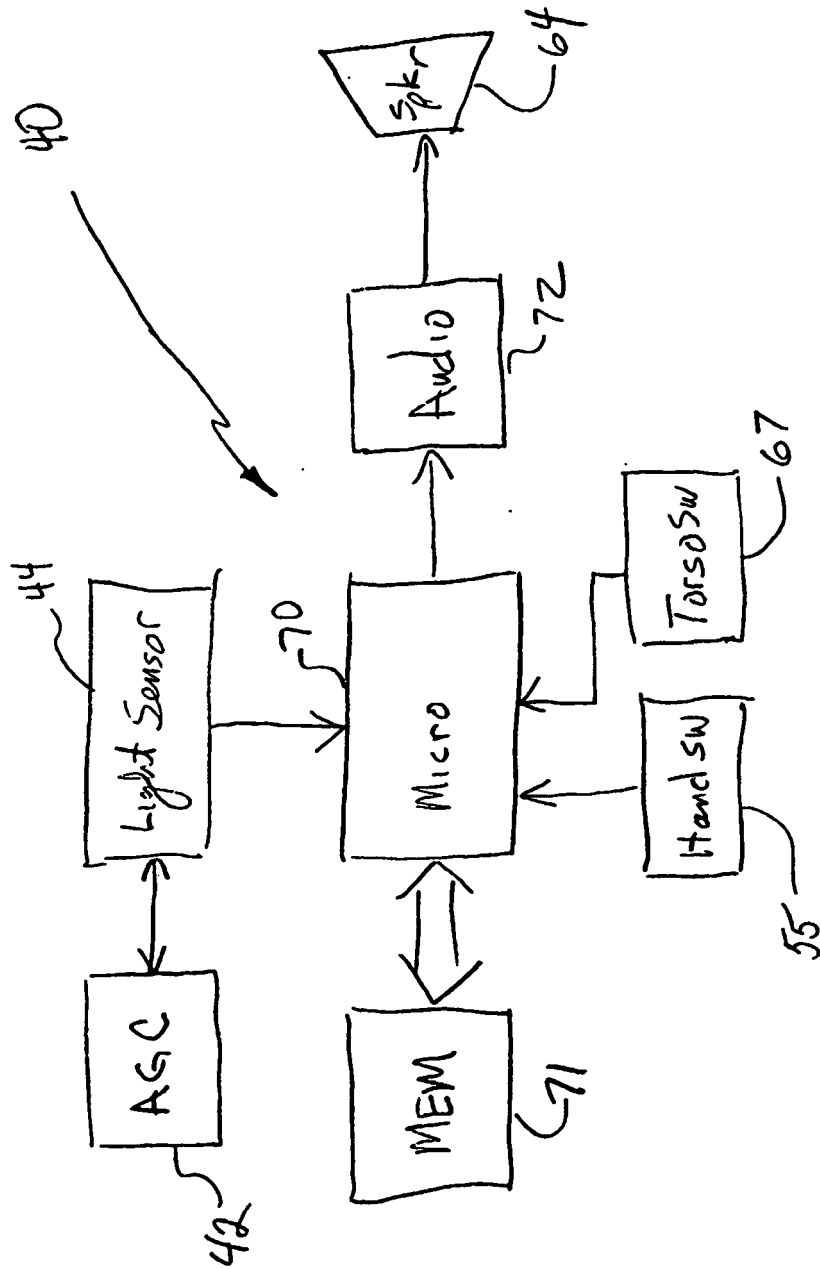


FIG 3