June 22, 1965 B. KARDON 3,190,038

WETTING DOLL WITH ELECTRICAL SOUNDING ALARM

Filed Nov. 13, 1962

Fig. 1

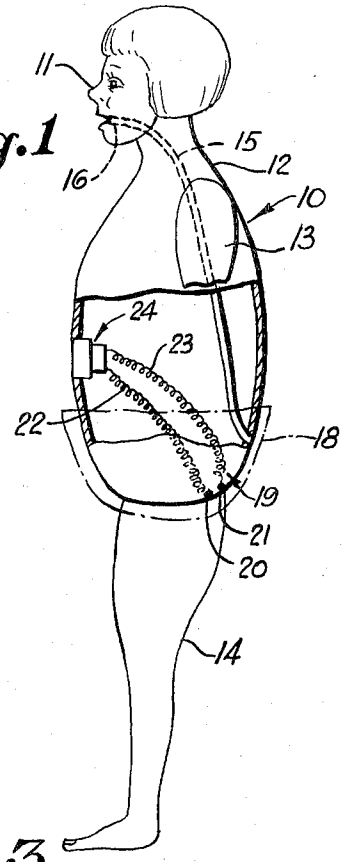


Fig. 2

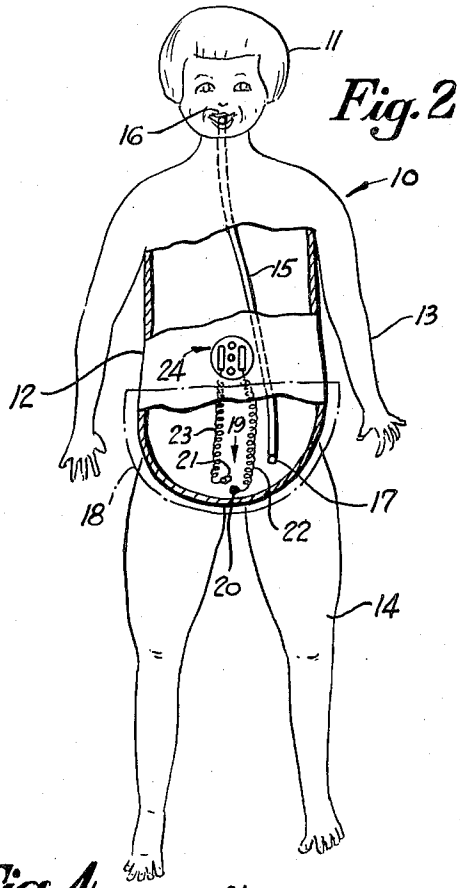


Fig. 3

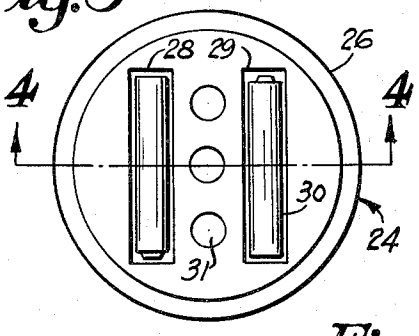


Fig. 4

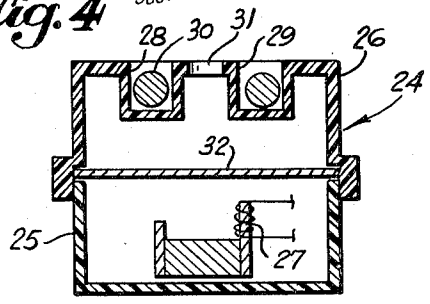
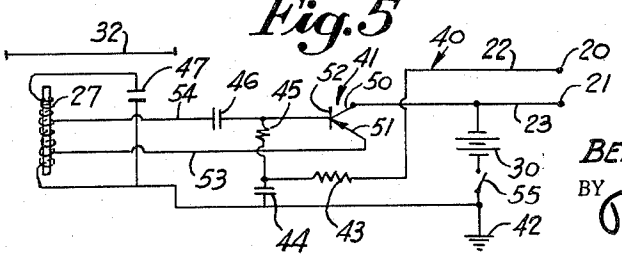


Fig. 5



INVENTOR.
BERNARD KARDON
BY Richards & Geier
ATTORNEYS

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WETTING DOLL WITH ELECTRICAL SOUNDING ALARM

Bernard Kardon, 80 Vaughn Ave., New Rochelle, N.Y.
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This invention relates to a doll and refers more particularly to a wetting doll which cries upon a wetting of its diaper and continues to cry until the wet diaper is removed.

It is known to make dolls which simulate the actions and mannerisms of real babies. For example, one type of doll construction provides for bottle feeding water or other liquid to the doll which results in the doll wetting its diaper after the fashion of a real baby. Furthermore, it is known to make dolls which simulate the crying of a real baby. In the case of the foregoing however, both of these actions are provided independently of each other. Thus, in prior art dolls, no means have been provided whereby a doll may be fed liquid, (usually water), wet itself, start to cry and continue to do so until the wet diaper is removed. From the viewpoint of achieving as much realism as possible in simulating the actions of a real baby, it thus becomes desirable to provide a doll which will start to cry in response to a wetting of its diaper and further will require a diaper change to stop its crying as it generally the case with real babies.

It is, therefore, a primary object to provide a doll which simulates some of the actions of a real baby.

Another object is to provide a doll which will start to cry in response to wetting its diapers, the simulated cry continuing as long as the diaper is wet.

Still another object is to provide a doll which will not wet itself and hence start to cry until a reasonable delay in time after feeding.

A further object is to provide an improved doll construction.

Other objects of the present invention will become apparent in the course of the following specification.

In achieving the aforementioned objectives of the present invention, it was found advantageous to provide a doll with a feed tube extending from the doll's mouth to a point near the bottom of the torso through which water or other liquid may be fed. A sensor element is located in the lower torso a distance away from the terminal end of the feed tube. Water or liquid issuing from the latter, will soak a diaper pinned to the lower torso and in time will saturate the sensor element. The latter action will activate the sensor to close an electronic circuits, the components of which are carried in a casing in the torso. The electronic circuit includes devices which will in response to the sensor signal generate a modulated sound simulating the cry of a real baby. The crying will continue as long as the sensor element is wet and hence it will be necessary to change the wet diaper in order to stop the doll's crying.

Th invention will appear more clearly from the following detailed description when taken in conjunction with the accompanying drawing showing by way of example, a preferred embodiment of the inventive concept.

In the drawings:

FIGURE 1 is a side elevational view of a doll constructed in accordance with the principles of the present invention.

FIGURE 2 is a front elevational view of FIGURE 1.

FIGURE 3 is a front elevational view of the casing which carries the sound producing components.

FIGURE 4 is a sectional view as taken along line IV—IV of FIGURE 3.

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FIGURE 5 is a wiring diagram of the various elements comprising the sound generating device.

Throughout the specification, like reference numerals are used to indicate like parts.

Referring now in greater detail of FIGURES 1 and 2, the doll 10 has a head 11, torso 12, arms 13 and legs 14. The doll is provided with a feed tube 15 which extends from an opening in the doll's mouth 16 to a discharge opening 17 at the back a small distance above the bottom of the torso. The feed tube may be made of various materials as for example, plastic, rubber, metal etc. Furthermore the tube may be provided with sections of reduced diameter to retard flow therethrough. The exact location of discharge opening 17 will be pre-determined so that water dischcarging therefrom into the absorbent diaper 18 will take some period to saturate the diaper in the region of the after described sensor element 19. This factor coupled with the absorption quality of the diaper material will retard wetting of the sensor element until a reasonable time lapse after initially feeding water or other suitable liquid into the doll's mouth. For the latter purpose a "doll's bottle" of a type old and well known in the art may be utilized. The time lapse will generally be computed to correspond to the actions of a real baby. That is to say wetting will occur only some time after feeding.

The sensor element 19 comprises metallic buttons 20 and 21 which may also be plain rivets to which are connected respectively conductor wires 22 and 23. The buttons 20, 21 are preferably located at the lowermost point of the torso at the rear. The conductor wires 22, 23 extend upwardly toward the front of the torso near the middle and pass through carrier 24 which is supported in the torso, and are connected in the after described electronic sound generating circuitry.

The carrier 24 comprises a cup-like base member 25 and a cover 26. The base member 25 houses some of the electronic circuit components shown in FIGURE 5 as for example, the electromagnet 27. Cover member 26 fits over base 25 and is provided with recessed portions 28 and 29 for recessing dry cell batteries 30. The cover member 26 is also provided with a number of openings 31. A diaphragm disc 32 is supported between base 25 and cover member 26.

In use, a quantity of water or other suitable liquid may be fed into the doll. By means of feed tube 15, this liquid will flow out opening 17 and will wet diaper 18. In time the saturation of diaper 18 will spread to the area around sensor buttons 20, 21. These buttons which are in the electronic sound generating circuit 40 and which circuit is normally open, will be connected by the moisture in the diaper and the circuit will be closed. The electronic circuit will generate a sound simulating a baby's by which sound will be emitted as long as the diaper is wet and in contact with the sensor element. Thus the diaper needs to be removed to silence the cries of the doll.

The construction and function of the electronic sound generating circuit 40 is illustrated in FIGURE 5. Now referring thereto in greater detail, the electronic sound generating circuit comprises sensor buttons 20, 21 and their respective conductor wires 22, 23, a transistor 41, batteries 30, ground connection 42, leak-off resistor 43, storage condenser 44, bias resistor 45, coupling condenser 46, tuning condenser 47, diaphragm 32 and electromagnet 27. The circuit illustrated is commonly referred to as a "blocking Hartley Oscillator" the latter, being a "Hartley Oscillator" which includes provision for blocking or stopping the electrical oscillations and hence the diaphragm vibrations at a controlled rate.

In normal inoperative condition of circuit 40, that is to

say when the diaper 18 is dry, only a very slight current flows from battery 30 to the collector 50 of the transistor and across to the emitter 51. This slight amount of current passes into the electromagnet 27 but its effect thereon is nil, the current passing out to ground 42. On the other hand, when the doll has been fed a quantity of liquid, the diaper is wetted and the liquid establishes continuity between sensor buttons 20, 21. Current now flows from the battery through leak-off resistor 43, through bias resistor 45 and through transistor base 52. By virtue of the switch-like action of transistors, this causes a large amount of current to pass from battery 30 through transistor collector 41, then through transistor emitter 51, and lead 53 to the electromagnet 27, which component attracts diaphragm 32. The increasing magnetic flux in the electromagnet causes a back E.M.F. to be generated and applied via lead 54 and coupling condenser 46 to the transistor base 52, in such polarity as to cancel out the forward bias, applied via bias resistor 45. This effectively shuts off the current flow in the transistor collector-emitter circuit, which results in the collapse of the electromagnet's flux, and the elimination of the back E.M.F. bias. At this point, the cycle repeats itself, at a rate determined by the resonant circuit formed by the electromagnet 27 and tuning capacitor 47. In practice a vibration of the diaphragm of approximately 800 c.p.s. was found to emit a realistically sounding cry.

In time, the back E.M.F. generated in lead 54 charges up storage condenser 44, preventing the application of forward bias via leaking resistor 43 and bias resistor 45 to base 52. The transistor collector-emitter circuit is thereby shut off, and the diaphragm ceases to vibrate. Since however, the diaper will remain wet for some time, the cycle repeats with current flowing back to transistor base 52, into the electromagnet etc. The rapid changes from full current flow in base 52 to a collapsed potential therein, causes alternately, the vibrating and shutting of diaphragm 32. The pulsating noise emitted therefrom thus sounds just like the cry of a real baby.

The foregoing continues until diaper 18 dries or is removed from the doll. For the purpose of deactivating the circuit 40 when the doll is not being played with and in order to lengthen the life of batteries 30, a manually operated switch 55 is connected in series with the batteries. The switch may be located at any convenient accessible location on the torso.

It is seen therefore that the present invention provides a doll construction which is most realistic in that the doll will cry if its diaper is wet and will continue to do so until changed.

While there is described above the use of a battery powered, sound generating device for simulating the cry of a real baby, other means may be employed to accomplish the same result. For example, the batteries 30 may be eliminated and dissimilar metals, for example gold and silver, used for sensor buttons 20, 21. Thus if salt water is used for feeding, the salt water will effect an electrolysis action between the sensor buttons. The current flowing

therebetween powers the circuit 40. Other non-electrical means may also be used to create the crying sound. For example, a disc having an absorbent strip on one side and a non-absorbent strip on the other side may be placed on the torso. When wet, the strip will bend as one side will stretch. This bending of the strip may be used to regulate a valve for allowing air to flow from an air accumulator housed in the doll's torso. The air flow may also be used in part to dry the strip so that the sound action may be cycled. Furthermore, a chemical pellet which generates a gas in response to wetting thereof may be used, the generated gas being expelled at a controlled rate to simulate a cry. It is also possible to use a spring wound phonograph with a record to create a crying sound while employing one of the electrical or mechanical sensing devices above described for the purpose of triggering the phonograph.

While there are disclosed but some embodiments of the doll, it is possible to produce others within the scope of the inventive concept herein disclosed.

What is claimed is:

1. In combination with a doll comprising a head having a mouth opening, a torso having a rear opening, a feed tube extending from said mouth opening to said rear opening and a diaper removably attachable to the bottom portion of said torso and covering said rear opening, said diaper being composed of an absorbent material adapted to absorb liquid discharged from said rear opening; two spaced metal members carried upon the bottom portion of said torso adjacent said rear opening and adapted to be covered by said diaper, electrical current supplying means located within said torso and connected with said metal members, said current supplying means constituting an electrical circuit containing said spaced metal members, said spaced metal members constituting the terminals of a switch which is closed by the liquid absorbed by the diaper, and electronic sound generating means located within said torso and operatively connected with said current supplying means, said sound generating means being actuated to produce an audible sound when the circuit of said current supplying means is closed between said metal members.

2. A doll in accordance with claim 1, wherein said metal members consist of metallic buttons.

3. A doll in accordance with claim 1, wherein said sound generating means comprise means generating intermittent sounds.

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DELBERT B. LOWE, *Primary Examiner.*

RICHARD C. PINKHAM, *Examiner.*