

June 9, 1964

R. GARDEL ETAL
CRYING DOLL MECHANISM

3,136,089

Filed July 26, 1962

4 Sheets-Sheet 1

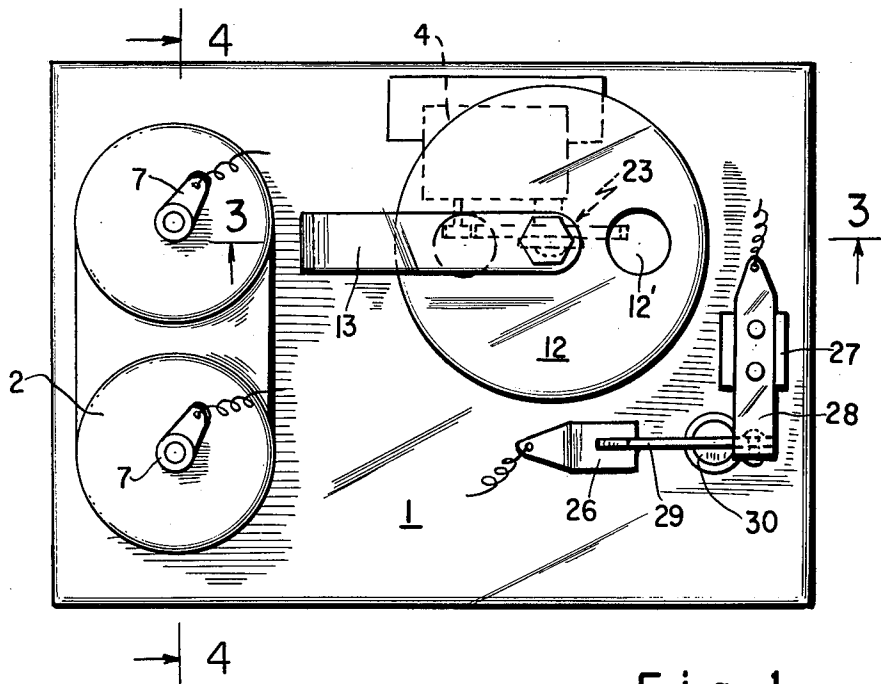


Fig. 1

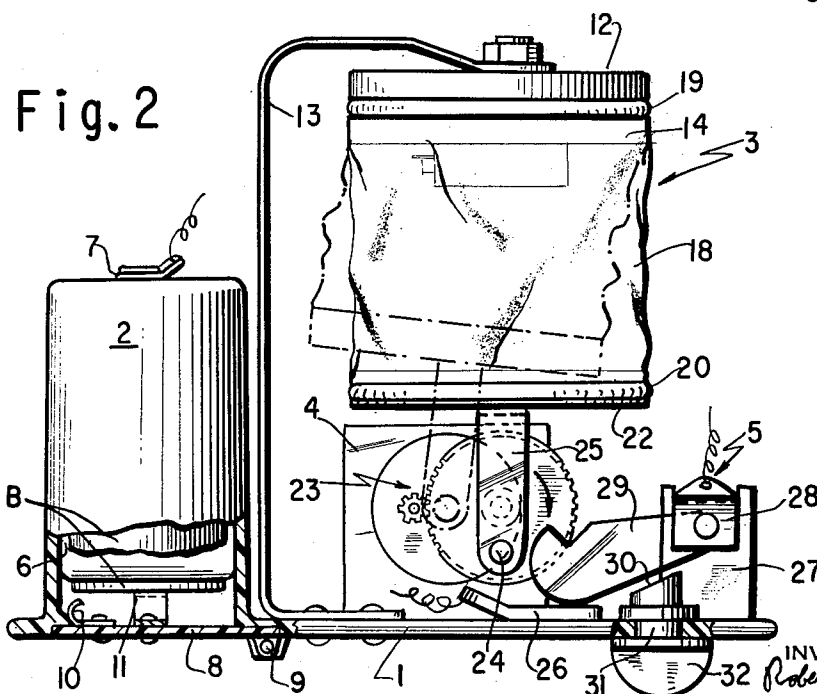


Fig. 2

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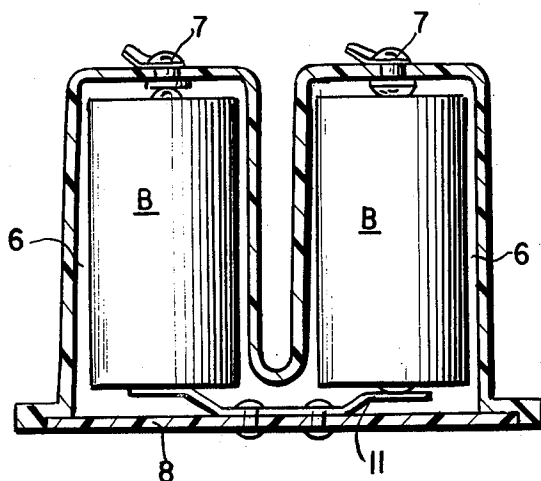
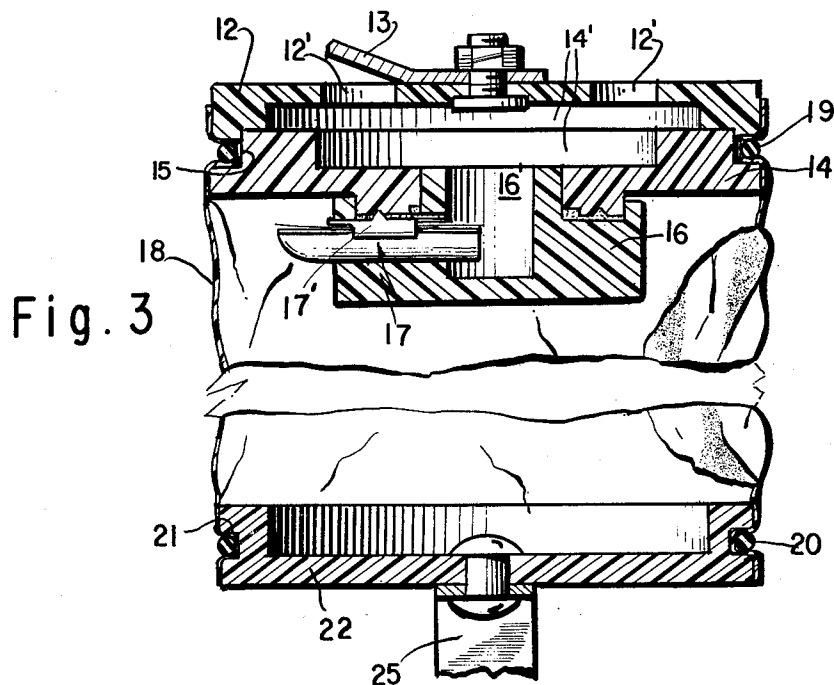
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Fig. 5

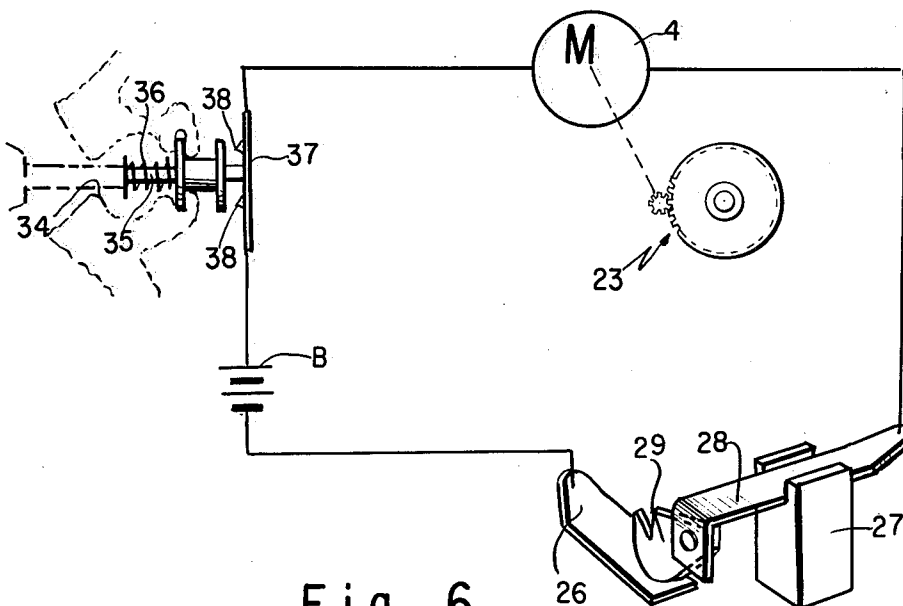
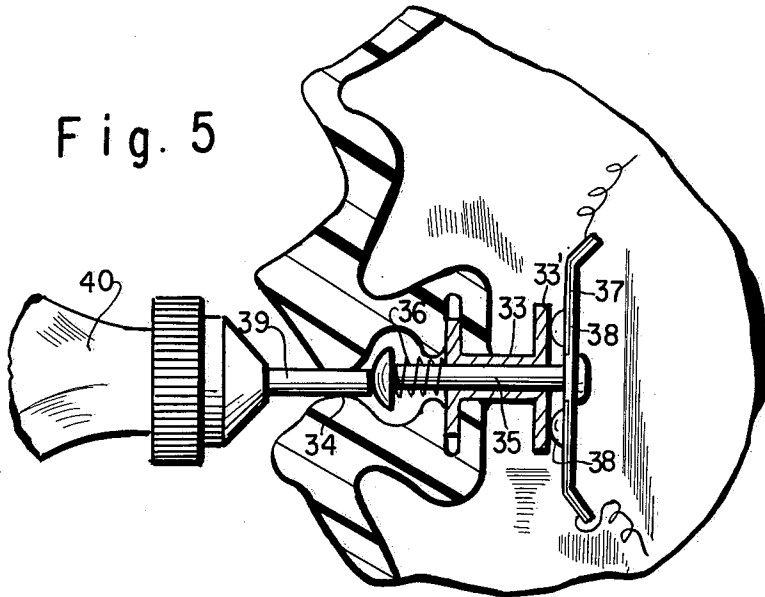


Fig. 6

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Fig. 7

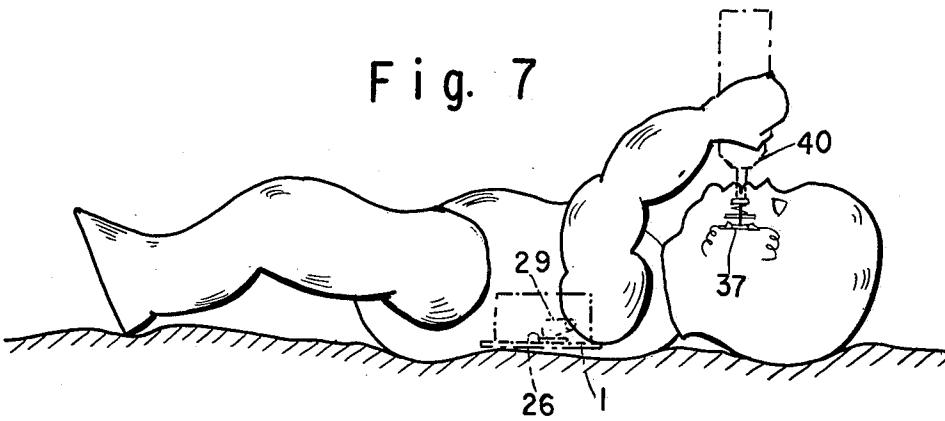


Fig. 8

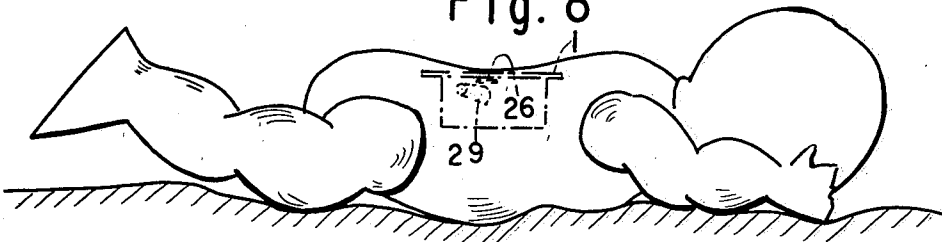


Fig. 9

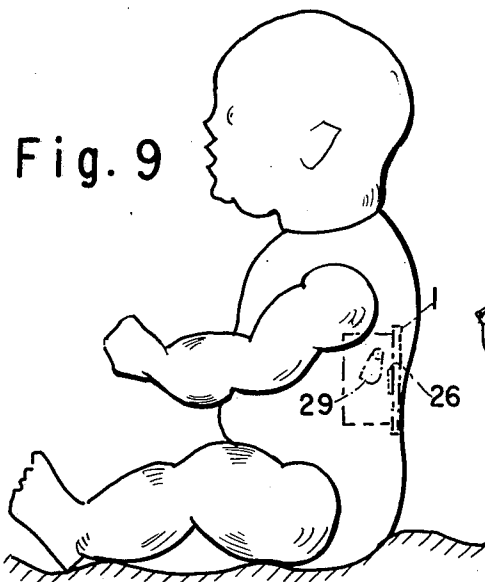
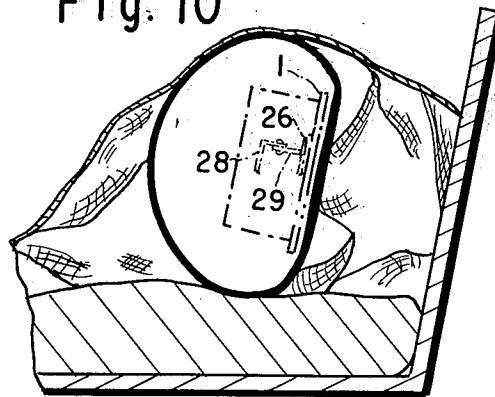


Fig. 10



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CRYING DOLL MECHANISM

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3 Claims. (Cl. 46—232)

This invention relates to a crying doll mechanism, and particularly to such a mechanism which is motor driven.

It is an object of the invention to provide a crying mechanism which is driven by a battery-powered electric motor.

It is a further object to provide such a mechanism in which the motor circuit has a switch which is biased toward circuit-closing position and adapted to be opened by causing the doll to simulate a desired action such as drinking from a bottle.

It is another object to provide such a mechanism in which the motor circuit has a second switch, in series with the switch just mentioned, the second switch being actuated by the force of gravity so as to close or open according to the attitude of the doll in which the mechanism is mounted.

It is a further object to provide means for holding the second switch, just mentioned, in open position regardless of gravity, whereby said means constitutes, in effect, an on-and-off switch.

It is another object to provide an improved sound device, with better reed mounting, better sound and more durable bellows.

It is a further object to provide certain improvements in the form, construction and arrangement of the several parts whereby the above named and other objects may effectively be attained.

A practical embodiment of the invention is shown in the accompanying drawings, wherein:

FIG. 1 represents a plan view of the crying mechanism including base, battery holder, sound device, motor and gravity switch;

FIG. 2 represents a side elevation of the mechanism shown in FIG. 1, parts being broken away and in section, and a transitional position of the sound box bellows being shown in broken lines;

FIG. 3 represents a detail axial section, on an enlarged scale of the sound box and bellows, parts being broken away;

FIG. 4 represents a section through the battery holder, in the plane of the line IV—IV of FIG. 1;

FIG. 5 represents a detail vertical section, on an enlarged scale, of the doll mouth portion, with switch mounted therein and a bottle being applied thereto, parts being broken away;

FIG. 6 is a wiring diagram showing the motor circuit, battery and switches;

FIGS. 7, 8 and 9 show diagrammatically how changes in the position of the doll body can change the condition of the motor circuit, and

FIG. 10 represents diagrammatically a section taken approximately at the doll's waist line showing how the gravity switch adjusts between open and closed positions when the doll is lying on its side.

Referring to the drawings, the crying mechanism is shown as comprising a flat base 1, of non-conductive material such as a suitable plastic, a two cell battery holder 2 which may conveniently be molded as an integral part of the base, a sound device indicated generally at 3, a motor 4 and gravity switch (with lock) indicated generally at 5.

The battery holder 2 (FIGS. 2 and 4) has two cylindrical compartments 6, 6 with terminals 7, 7 fixed in the top of each. The bottom is closed by a door 8 hinged at 9 to the base 1 and having a snap catch 10, providing

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access to the battery compartments for replacement of batteries B, B. A conductive strip 11 is mounted on the door 8 in a position to connect the center terminal of one battery to the metal case of the other so that they will be in series, as is customary.

The sound device (FIGS. 1, 2 and 3) includes a head 12 supported from the base 1 by the bracket 13 and having a recessed under surface, an upper plate 14 secured to the head 12, having a recessed upper surface and so shaped as to form, with the head 12, a peripheral groove 15, a reed support 16 fixed to the plate 14 and having an axial chamber 16' communicating with the chamber 14' formed by the recesses in the head 12 and upper plate 14, and a reed unit 17 firmly gripped between the reed support and the upper plate. A bellows for operating the reed is formed by a flexible plastic (e.g. polyethylene) sleeve 18 having its upper edge portion firmly held in the groove 15 by a rubber ring 19 and having its lower edge portion held by a ring 20 in a similar groove 21 formed around the periphery of the bottom plate 22, this type of securement having been found to be air tight without the need for an adhesive. The head 12 has openings 12' for the passage of air to and from the chambers 14', 16' and the reed unit 17 projects from the support 16 into the bellows and extends also into the recess 16' in the reed support. The reed and tube are held together by means of the clip 17' which is formed with a small upward projection fitting a dent in the plate 14 which positions accurately and firmly the reed unit. The parts 12, 14 and 16 may suitably be made of molded plastic material and cemented together, while the reed unit is of metal.

The motor 4 drives the sound device through reduction gearing 23 the large pinion of which carries a crank pin 24 on which is journaled a rod 25 projecting downward from the middle of the plate 22. As indicated in FIG. 2, the circular movement of the pin 24 will cause compression and expansion of the bellows (in addition to the lateral movement which has no function), the compression stroke blowing air out through the reed unit, causing the reed to vibrate and give off the crying sound for which it is designed, while the suction stroke merely draws air in. The cries will be intermittent, on each compression stroke, as long as the motor operates. The chambers 14', 16' formed in the parts 12, 14 and 16 serve to give the sound unusual reasonance and depth, quite different from the squeaky noises emitted by other sound devices.

The gravity switch comprises a small contact plate 26 fixed on the base 1, a mounting block 27 also fixed on the base, a conductive bar 28 mounted on the block and a tumbler 29 journaled in the end of the bar 28 in such a position that its free end can rest on the plate 26 when the mechanism is in the attitude represented by FIG. 2, for instance. A lock for holding the tumbler 29 out of contact with plate 26 is shown as comprising a cam surface 30 on the inner end of a short shaft 31 journaled in the base 1 and having a finger grip 32 on the outside or bottom. The surface 30 is so disposed adjacent the lower edge of the tumbler 29 that it does not contact said edge in the position shown in FIG. 2 but will, when turned about 90° to 180° in either direction, come into contact with said edge so as to lift the free end of the tumbler 29 off the plate 26. As long as the lock stays in such an interfering position the circuit through the tumbler 29 and plate 26 will remain open.

The crying mechanism described above is preferably mounted in a doll body as indicated in FIGS. 7 to 10, the base 1 being firmly fixed to the back wall of the doll body and at least enough of said back wall being cut away to provide access to the finger grip 32. If desired, the base 1 may replace a corresponding area of the back wall and constitute a panel, removably fixed therein, so as to

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facilitate replacement of the battery cells when needed.

An additional important feature of the invention is the provision of a mouth switch (FIGS. 5 and 6) comprising a conductive sleeve 33 molded into the material of the head just inside the mouth 34, a headed plunger 35 slidable in said sleeve and urged outward by a spring 36, a flat contact support 37 fixed on the inner end of the plunger 35 and a pair of contacts 38 mounted on said support in positions to bear against an inner flange 33' of the sleeve when the plunger is drawn outward by the action of the spring. The contacts 38 are connected in series with the batteries, gravity switch and motor, as indicated in FIG. 6. From the foregoing it will be seen that the gravity switch has no "normal" position (open or closed) but can be locked open, while the mouth switch is normally closed. Means for opening the mouth switch may be a rigid projection 39 on the "nipple" end of a simulated milk bottle 40, or could be a suitable shaped thumb on one of the doll's hands, disposed to be movable into a simulated thumb-sucking position. In either case the introduction of such an element into the doll's mouth pushes in the plunger and breaks the contact between contacts 38 and flange 33'.

In operation, this mechanism is capable of responding interestingly to a variety of conditions. If the lock is turned to an "off" position where the gravity switch is held open, the whole system is kept inactive and the doll cannot be made to cry by any sort of manipulation. When the lock is turned to an "on" position, freeing the tumbler of the gravity switch, there are several possibilities:

Placing the doll on its back, the gravity switch will close (FIG. 7) and the doll will cry. Giving the doll its bottle (FIGS. 6 and 7)—or its thumb—will open the mouth switch and stop the crying.

Placing the doll face downward (FIG. 8) the gravity switch will open and the doll will not cry, regardless of the mouth switch.

Placing the doll upright (FIG. 9) the gravity switch may be open or closed, depending on the inclination of the body. If it inclines backward enough to close the switch, the doll will cry until it is given its bottle or thumb. Alternatively it can be inclined forward, as if playing with its toes or a toy, and the switch will swing open and stop the crying.

Placing the doll on its side (FIG. 10), as in a bed, the

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crying again depends on the inclination of the body; slightly forward, no crying; slightly rearward, crying unless it is stopped by the mouth switch.

A doll having the capabilities described appeals strongly to a child, particularly when the doll seems to start crying almost of its own volition (actually by a slight change in attitude) and then can be quieted by a constructive act on the child's part, as by giving the doll a bottle or turning it to lie face down.

It will be understood that various changes may be made in the form, construction and arrangement of the several parts without departing from the spirit and scope of the invention, and hence I do not intend to be limited to the details herein shown or described except as the same are included in the claims or may be required by disclosures of the prior art.

What we claim is:

1. A crying doll mechanism comprising, a sound device, an electric motor in driving connection with said device, a source of electric current in circuit with said motor, a switch in said circuit movable from closed to open position by the insertion of a suitable shaped solid member in the doll's mouth, and a second switch in series in said circuit, said second switch including an element movable between closed and open positions under the influence of the force of gravity.

2. A crying doll mechanism according to claim 1 which includes also manually operated means for locking said element in circuit opening position.

3. A crying doll mechanism according to claim 1 in which the first named switch includes separable contact points normally biased toward closed position, and a movable element having a portion in a position to be contacted by said solid member, at least one of said points being secured to said movable element.

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