July 12, 1966 J. W. RYAN 3,260,015

BABY DOLL BURP MECHANISM

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FIG-1

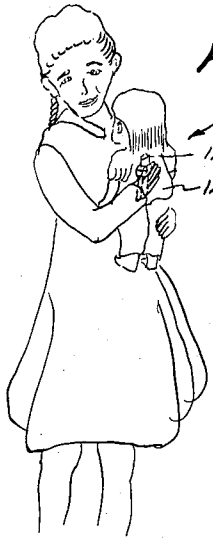


FIG-2

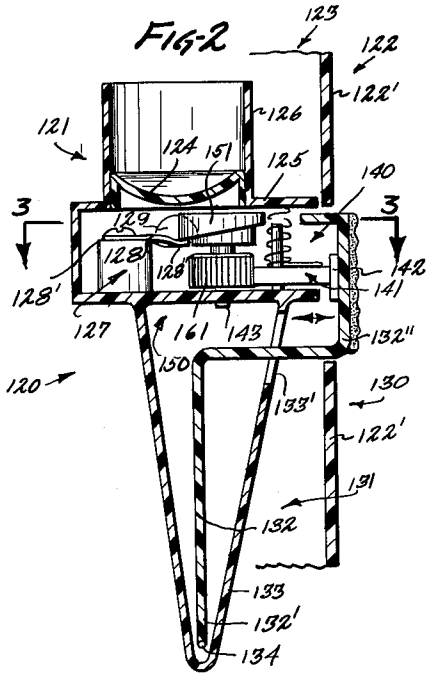


FIG-3

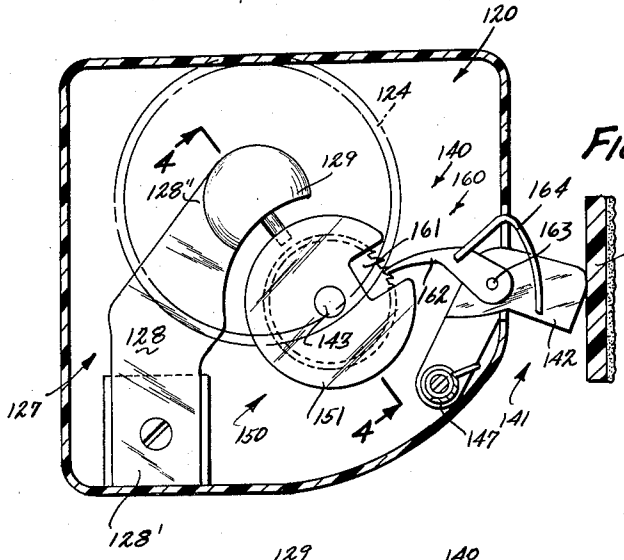
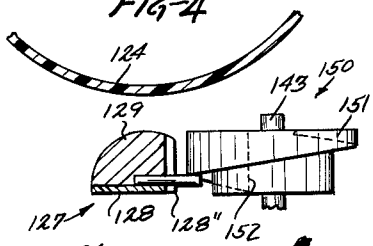


FIG-4



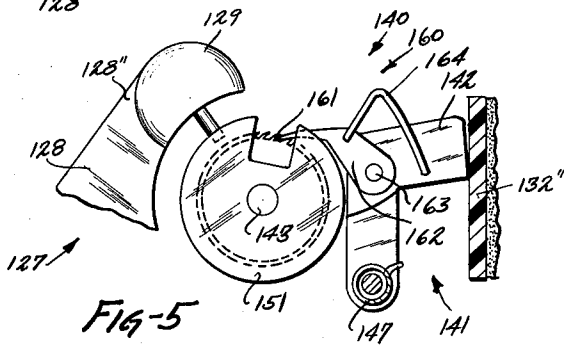


FIG-5

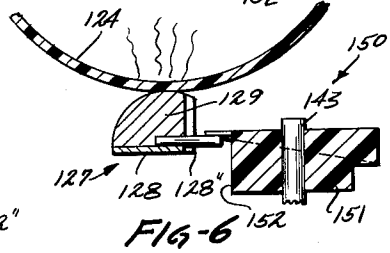


FIG-6

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BABY DOLL BURP MECHANISM

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FIG-8

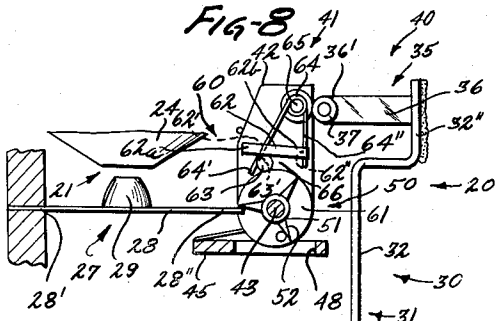


FIG-9

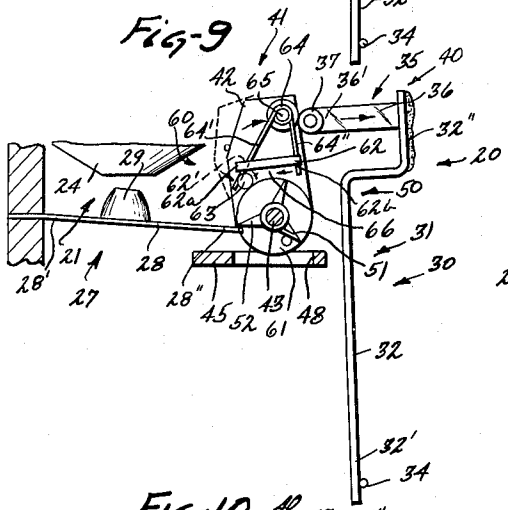


FIG-10

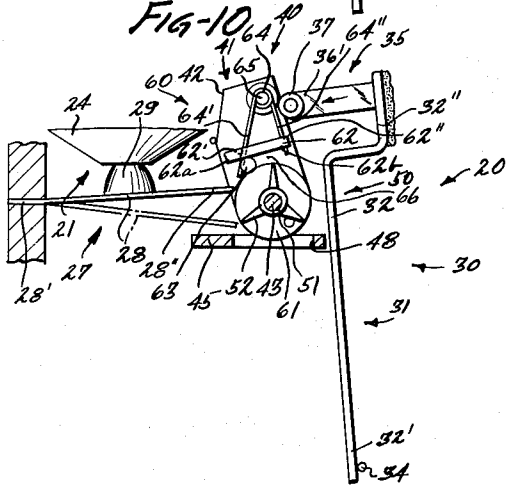
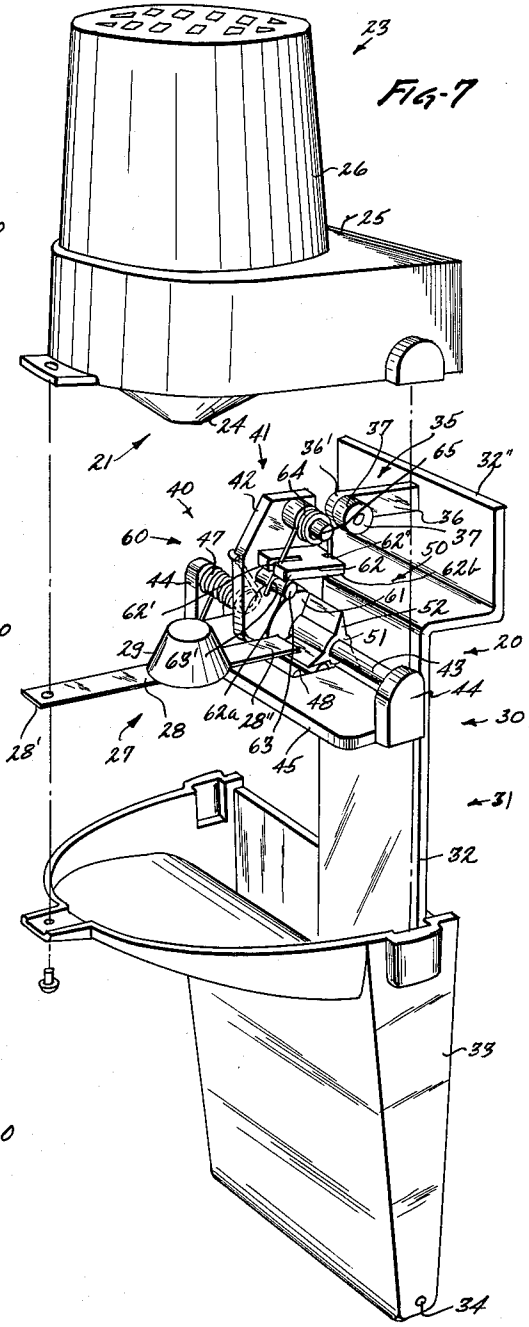


FIG-7



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3,260,015

BABY DOLL BURP MECHANISM

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Filed Apr. 22, 1964, Ser. No. 361,766
9 Claims. (Cl. 46—117)

In general, the present invention relates to a baby doll burp mechanism. More specifically, the present invention relates to a baby doll burp mechanism adapted to be operated by patting the baby doll on the back and to periodically produce a burp sound when operated so as to simulate the actual behavior of a baby.

In recent years there have been substantial advances in the construction of dolls which simulate the physical appearance and behavior of real people. Thus, for example, baby dolls have been constructed which have the capability of emitting a burping sound when operated. However, such prior art baby doll burp mechanisms usually did not achieve a realistic reproduction of the actual burp sound emitted by babies and thus the illusion intended to be created by the doll was impaired. More important, the prior art baby doll burp mechanisms were usually actuated in one brief operation, such as squeezing the doll which is contrary to the normal practice of burping a baby by patting it gently on the back for a period of time to cause the baby to burp. Thus, not only did the prior art fail to operate the burp mechanism in the way that burping is normally obtained in a baby, but also failed to allow for the normal time lag between the initial patting action and the burp which is finally produced.

Consequently, the object of the present invention is a baby doll burp mechanism adapted to be operated by patting the baby doll on the back.

Another object of the present invention is a baby doll burp mechanism adapted to only periodically produce a burp sound when operated by repeated patting on the back of the baby doll.

Still another object of the present invention is a simply constructed and operated baby doll burp mechanism which is adapted to produce a realistic burping sound.

Other objects and advantages of the present invention will be readily apparent from the following description and drawings which illustrate a preferred exemplary embodiment of the present invention.

In general, the present invention involves a baby doll burp mechanism comprising a burp sound means mounted within a baby doll and adapted to emit a burp sound when operated. Also mounted within the baby doll are actuator means which are adapted to be operated by patting the baby doll on the back. Operatively connected between the actuator means and the burp sound means are control means adapted to convert the repeated operation of the actuator means into periodic operation of the burp sound means.

In order to facilitate understanding of the present invention, reference will now be made to the appended drawings of a preferred specific embodiment as well as an alternate specific embodiment of the present invention. Such drawings should not be construed as limiting the invention which is preferably set forth in the appended claims.

In the drawings:

FIGURE 1 illustrates the way a child can operate a baby doll incorporating the present invention;

FIGURE 2 is a longitudinal cross section of a portion of a baby doll illustrating an alternate embodiment of a baby doll burp mechanism of the present invention;

FIGURE 3 is a cross-sectional view of FIGURE 2 taken along the lines 3—3 of FIGURE 2;

FIGURE 4 is a cross-sectional view of FIGURE 3 taken along the lines 4—4 of FIGURE 3 showing an enlarged portion of FIGURE 2 and illustrating the initial operation of the baby doll burp mechanism;

FIGURE 5 is a view similar to FIGURE 3 showing the operation of the baby doll burp mechanism when the back of the baby doll is patted;

FIGURE 6 is a cross-sectional view similar to FIGURE 4 illustrating the operation of the burp sound means of the baby doll burp mechanism;

FIGURE 7 is an exploded perspective view of the preferred embodiment of the present invention;

FIGURE 8 is a side elevation of the device shown in FIGURE 7 illustrating the start of its operation;

FIGURE 9 is similar to FIGURE 8 showing an intermediate stage of the operation of the present invention; and

FIGURE 10 is similar to FIGURE 8 showing the operation of the present invention at the point of the production of the burp sound.

As illustrated in FIGURES 7–10, the preferred embodiment of the baby doll burp mechanism **20** includes a burp sound means **21** mounted within a baby doll (not shown) and adapted to emit a burp sound when operated. Also mounted within the baby doll are actuator means **30** adapted to be operated by patting the baby doll on its back. Operatively connecting the actuator means **30** with the burp sound means **21** is a control means **40** which is adapted to convert the repeated operation of the actuator means **30** into periodic operation of the burp sound means **21**. The burp sound means **21** mounted within the baby doll, as noted above, is adapted to emit a burp sound when operated. Thus, the burp sound means **21** includes a resonator means **23** for emitting a burp sound when struck and a hammer means **27** adapted to strike the resonator means **23** and to be operated by the control means **40**. The resonator means **23** includes a cone **24** having its apex adjacent the hammer means **27** and which is mounted on a frame **25** within the doll **22**. Extending coaxially from the base of the cone **24** is a sound tube **26** which is adapted to modulate the sounds generated by the cone **24**. The hammer means **27** includes a spring arm **28** which is fixed at its first end **28'** and has a second free end **28''** extending adjacent to the control means **40**. Mounted on the spring arm **28** is a hammer head **29** which is adapted to strike the apex of the cone **24** when the hammer means **27** is operated.

Also mounted within the baby doll is an actuator means **30** adapted to be operated by patting the baby doll on its back. The actuator means **30** comprises a lever means **31** operated by patting the baby doll on its back and connecting arm means **35** for transferring the motion of the lever means to the control means **40**. The lever means **31** includes a lever arm **32** which is pivoted on a base **33** which is adapted to support the frame **25** of the burp sound means **21**. More specifically, the first end **32'** of the lever arm **32** is pivoted on an axis **34** mounted on the base **33** and the lever arm **32** has a second free end **32''** which forms an offset flange positioned adjacent the back of the baby doll. A spring (not shown) biases the lever arm **32** into a position with the flange **32''** adjacent the back of the baby doll. The connecting arm means **35** comprises a post **36** mounted on the free end **32''** of the lever arm **32** and extending inwardly with its free end **36'** adjacent to the control means **40**. Mounted on the free end **36'** of the post **36** is a connecting roller **37** which is adapted to contact the drive means **40** when the lever arm **32** is moved inwardly by a pat on the back of the baby doll.

Operatively connecting the actuator means **30** with the burp sound means **21** is a control means **40** which is adapted to convert the repeated operation of the actuator means **30** into periodic operation of the burp sound means **21**. The control means **40** comprises drive means **41** adapted to perform oscillatory motion when operated by the actuator means **30** and regulator means

50 for periodically operating the burp sound means 21. A clutch means 60 translates the oscillatory motion of the drive means 40 into unidirectional motion of the regulator means 50. The drive means 41 comprises a drive arm 42 rotatably mounted on an axle 43 which in turn is mounted between a spaced pair of columns 44. The columns 44 are mounted on the base 33 and have a brace 45 also extending therebetween. The drive arm 42 is biased into contact with the connector roller 37 of the actuator means 30 by a drive spring 47 mounted on the axle 43 between one of the columns 44 in the drive arm 42. Thus, the initial position of the drive arm 42 is adjoining the actuator means 30 when the actuator means 30 is in its initial position. Also, when the lever arm 32 of the actuator means 30 is returned to its initial position by the biasing spring (not shown), the drive spring 47 of the drive means 41 returns the drive arm 42 to its initial position.

The regulator means 50 comprises a paddle wheel 51 rotatably mounted on the axle 43 with a spaced series of paddles 52 extending outwardly therefrom around its circumferences and received in a slot 48 in the brace 45. Each of the paddles 52 is adapted to cause a single operation of the burp sound means 21 during the rotation of the paddle wheel 51 by engaging the free end 28'' of the spring arm 28, bending it so that the hammer head 29 moves away from the apex of the cone 24 and then suddenly releasing it so that the hammer head 29 strikes the apex of the cone 24.

The clutch means 60 comprises a drum 61 rotatably mounted on the axle 43 and fixedly connected to the paddle wheel 51 of the regulator means 50. Also, the clutch means 60 includes block 62 fixedly connected to the drive arm 42 of the drive means 40 and adapted to rotate about the drum 61. Positioned on the drum 61 between the drum 61 and the block 62 is a clutch roller 63 which is adapted to fixedly connect the drum 61 and the block 62 during the rotation of the block 62 in one direction, i.e. a counter-clockwise direction, as illustrated in FIGURE 8, and disconnect the drum 61 from the block 62 during rotation of the block in the opposite direction. The clutch roller 63 is maintained in such position by means of spring 64 wound around a post 65 mounted on the drive arm 42 and extending adjacent the block 62. The first end 64' of the clutch spring 64 extends through a first slot 62' in the block 62 and is received in a circumferential groove 63' in the clutch roller 63. The second end 64'' of the clutch spring 64 is received in a second slot 62'' in the block 62 and is braced therein. The gap 66 between the block 62 and the drum 61 is decreased in width at one end of the block whereby the roller 63 is wedged therein during the rotation of the block 62 in the one direction, i.e. counterclockwise direction. Conversely, the gap 66 is increased in width at the opposite end of the block so that during the rotation of the block 62 in the opposite direction, the result is that the roller freely rotates therein. As illustrated in FIGURE 9, such range in gap width is attained simply by positioning the block 62 at an angle with respect to the roller 61 so that one end of the block is closer to the roller 61 than the other end of the block.

The operation of the present invention is illustrated in FIGURES 8–10; as shown therein when a child strikes the back of the baby doll, the back pushes the lever arm 32 of the actuator means 30 inwardly because of the contact of the back with the flange 32'' of the lever arm 32. Such movement is translated via the post 36 and the roller 37 to the drive arm 42 so that the drive arm 42 in turn is rotated inwardly. The inward rotation of the drive arm 42 rotates the block 62 inwardly so that its first end 62*a* which is slightly farther from the drum 61 moves the clutch roller 63. Concurrently, the first end 64' of the spring 64 mounted on the drive arm 42 maintains the clutch roller 63 in position on the drum 61 so that the clutch roller 63 becomes wedged between the block 62 and the roller 61 during the aforementioned motion of the block 62. Thus, the block 62 becomes fixedly connected to the drum 61 and the inward rotation of the block 62 causes the drum 61 to rotate counterclockwise about its axle 43. Such rotation of the drum 61 in turn rotates the paddle wheel 51 so that paddle 52 moves towards engagement with the free end 28'' of the hammer spring 28.

When the child then removes its hand in preparation to pat the back of the baby doll, the drive spring 47 rotates the drive arm 42 outwardly back to its initial position. Such rotation of the drive arm 42 in turn rotates the block 62 so that its second end 62*b* slightly closer to the drum 61 moves away from the clutch roller 63. Such movement of the block 62 effectively increases the gap width between the block 62 and the drum 61 so that the clutch roller 63 becomes freely rotatable therein while being maintained in position on the drum 61 by the spring 64. Thus, the block 62 is disengaged from the drum 61 while the clutch roller 63 maintains the position achieved by the drum 61 during the forward rotation of the drive arm 42. Concurrently, the lever arm 32 is returned to its initial position by a spring bias so that the flange 32'' keeps contact with the back of the baby doll.

When the child again strikes the back of the doll and then removes his hand during the patting of the doll back, the aforementioned sequence of events again occurs so that the paddle 52 on the paddle wheel 51 continues to move toward engagement with the hammer spring 28. After a few pats, the paddle 52 engages the free end 28'' of the hammer spring 28 and bends the hammer head 29 away from the apex of the cone 24. Continued rotation of the paddle 52 caused by continued patting of the doll back finally causes the paddle 52 to bend the hammer spring 28 to the point that the free end 28'' slip past the paddle 52 and causes the hammer head 29 to strike the apex of the cone 24 to cause the burp sound means to emit a burping sound. Continued patting of the baby doll 22 then causes the same sequence of events to occur so that after the time delay involved in a series of pats, a burping sound is produced and successive burping sounds are produced only after successive series of pats.

An alternative embodiment of the present invention is illustrated in FIGURES 1–6 wherein the baby doll burp mechanism 120 is positioned adjacent the back 122' of the baby doll 122. Similar to FIGURES 7–10, the burp sound means 121 includes a resonator means 123 for emitting a burp sound when struck. The resonator means 123 comprises flexible hemispherical membrane 124 mounted within a sound tube 126 which is in turn mounted on a frame 125. The burp sound means 123 also include a hammer means 127 which is adapted to strike the resonator means 123 and to be operated by the control means 140. The hammer means 127 includes a hammer spring 128 fixed at its first end 128' with its free end 128'' extending adjacent to the control means 140. Mounted adjacent the free end 128'' of the hammer spring 128 is a hammer head 129 which is adapted to strike the resonator means 123 of the burp sound means 121.

The actuator means 130 of the burp sound mechanism 120 in FIGURES 1–6 comprises a lever means 131 operated by patting the baby doll on the back. Lever means 131 includes a lever arm 132 pivotally mounted on a base 133 with its first end 132' pivoted on a pivot bar 134 connected to the base 133 and a second end 132'' extending through an aperture 133' in the base 133 and forming an offset flange which adjoins the back 122' of the baby doll 122. Unlike the baby doll mechanism illustrated in FIGURES 7–10, the actuator means 130 is in direct contact with the control means 140 without an intervening connecting arm means.

The control means 140 of the baby burp mechanism 120 comprises a drive means 141 which is operated by the actuator means 130 and comprises a rotatably mounted drive arm 142 with a drive spring 147 adapted to maintain

the contact with the drive arm **142** and the back **122'** of the baby doll **122**. Unlike the baby burp mechanism **20** illustrated in FIGURES 7–10, the baby burp mechanism **120** has regulator means **150** which comprise a cam wheel **151** rotatably mounted on an axle **143** which in turn is mounted on the base **133**. The cam wheel **151** has at least one shoulder **152** which is adapted to cause a single operation of the burp sound means **121** during the rotation of the cam wheel **151**.

Similar to the baby doll burp mechanism **20** in FIGURES 7–10, the baby doll burp mechanism **120** includes a clutch means **160** for translating the oscillatory motion of the drive means **141** into unidirectional motion of the regulator toy means **150**. However, unlike the baby doll burp mechanism **20**, the clutch means **160** comprises a cog wheel **161** rotatably mounted on the axle **143** and fixedly attached to the cam wheel **151**. The cog wheel **161** is adapted to be rotated in one direction by the inward movement of the drive means **141** and unaffected by outward movement of the drive means **141**. Thus, as illustrated, the clutch means **160** includes a connecting pawl **162** pivotally connected to the drive arm **142** by pivot pin **163** and maintained in engagement with the cog wheel **161** by means of a connecting spring **164** braced between the connecting pawl **162** and the drive arm **142**.

The operation of the baby doll burp mechanism **120** involves the rotation of the cam wheel **151** by the inward movement of the pawl **162** caused by the inward movement of the drive arm **142**. Such rotation of the cam wheel **151** gradually bends the hammer head **129** away from the membrane **124** due to the movement of the free end **128''** of the hammer spring **128** with the inclined portion of the cam wheel **151**. The outward movement of the drive arm **142** caused by releasing the back **122'** of the baby doll **122** does not affect the rotation of the cam wheel **151** since the pawl **162** rides freely over the cog wheel **161**. In addition, the frictional engagement of the free end **128''** of the hammer spring **128** with the cam wheel **151** maintains the position of the cam wheel **151** during the outward movement of the pawl **162** with respect to the cog wheel **161**. When the cam wheel **151** rotates to the point where the free end **128''** of the hammer spring **128** drops off the shoulder **152**, the hammer head **129** strikes the membrane **124** causing the burp sound means **121** to emit a burp sound.

Many other specific embodiments of the present invention will be obvious to one skilled in the art in view of this disclosure. For example, as set forth above, a variety of burp sound means and actuator means, as well as various control means, may be utilized in the burp sound mechanism. Specifically, illustrated in FIGURES 1–10, various drive means, regulator means and clutch means may be utilized. In addition, other variations are possible for interconnecting the actuator means with the drive means portion of the control means. Thus, for example, a single spring biasing means on one of the two elements could be used to return them to their initial position.

There are many features in the present invention which clearly show the significant advance the present invention represents over the prior art. Consequently, only a few of the more outstanding features will be pointed out to illustrate the unexpected and unusual results attained by the present invention. One feature of the present invention is a baby burp mechanism adapted to be operated merely by patting the baby doll on the back in a fashion similar to the actual handling of a real baby. Another feature of the present invention is a baby burp mechanism wherein the burp sound is produced only after a period of patting of the baby doll on the back and each succeeding burp sound is preceded by a period of patting. Such behavior accurately reflects the behavior in real life of handling the baby and burping it. Still another feature of the present invention is a burp sound means which accurately reproduces the usual burp sounds made by a baby. Still another feature of the present invention is a simplified control means portion of the baby burp mechanism wherein oscillatory motion is translated into unidirectional motion without requiring the usual ratchet wheel and pawl arrangement. Thus, the construction and operation of such control means may be simplified.

It will be understood that the foregoing description and examples are only illustrative of the present invention and are not intended that the invention be limited thereto. All substitutions, alterations, and modifications of the present invention which come within the scope of the following claims or to which the present invention is readily susceptible without departing from the spirit and scope of this disclosure are considered part of the present invention.

What is claimed is:

1. A baby doll burp mechanism adapted to be operated by patting the baby doll on the back and to periodically produce a burp sound when operated so as to simulate the actual behavior of a baby comprising:

(a) a burp sound means mounted within a baby doll and adapted to emit a burp sound when operated;

(b) actuator means mounted within said baby doll and adapted to be operated by patting said baby doll on the back; and

(c) control means operatively connecting said actuator means with said burp sound means and being adapted to convert the repeated operation of said actuator means into periodic operation of said burp sound means; said control means comprising drive means adapted to perform oscillatory motion when operated by said actuator means, regulator means for periodically operating said burp sound means, clutch means for translating the oscillatory motion of said drive means into unidirectional motion of said regulator means, said clutch means comprising a rotatably mounted drum fixedly connected to said regulator means, a block fixedly connected to said drive means and adapted to rotate about said drum, a roller positioned on said drum between said drum and block and adapted to fixedly connect said drum and block during the rotation of said block in one direction and disconnect said drum and block during rotation of said block in the opposite direction while maintaining the position of said drum.

2. A baby doll burp mechanism as in claim **1** wherein the gap between the block and the drum is decreased in width at one end of the block whereby said roller is wedged therein at said block end and the gap is increased in width at the opposite end of the block whereby said roller freely rotates therein at said block end.

3. A baby doll burp mechanism adapted to be operated by patting the baby doll on the back and to periodically produce a burp sound when operated so as to simulate the actual behavior of a baby comprising: means mounted within the doll figure for emitting a sound simulating a burping sound, means for actuating the burp sound means comprising an actuator positioned to be activated by patting the baby doll on the back, control means for controlling the emission of sound by the burp means, and means whereby the control means is activated only in response to several pats of the actuator means to produce a burping sound, said control means including a movable member and means holding said member against return to its initial position upon being activated until it has been activated an indeterminate number of times to produce said burping sound.

4. A device as in claim **3** wherein said burp sound means comprises an intermittently actuated device, said movable member control means comprises a rotor and mechanism to move said rotor in steps in response to movement of said actuator means whereby a burping sound is produced after an undetermined number and degree of actuations of the actuator member.

5. A device as in claim **3** wherein said movable member control means comprises a rotor, a lever means having engagement therewith for moving the rotor in steps

and means whereby the lever means moves the rotor in unpredetermined amounts in response to movements of the actuating member.

6. A baby doll burp mechanism adapted to be operated by patting the baby doll on the back and to periodically produce a burp sound when operated so as to simulate the actual behavior of a baby, comprising: sound producing means within a baby doll and adapted to emit a burp sound when operated; control means in said doll arranged to operate said sound producing means in response to only a predetermined total stimulus applied thereto; actuator means responsive to patting the body of said baby doll for applying to said control means a stimulus less than said predetermined total stimulus; said control means including means for accumulating successive stimuli from said actuator means to thereby actuate said sound producing means.

7. A mechanism as defined in claim 6 wherein said sound producing means comprises a resonator and hammer means arranged to strike said resonator; said control means including a movable member arranged to operate said hammer upon completion of a predetermined extent of movement in one direction; said actuator means being connected to said control means to impart successive increments of movement thereto only in said one direction and in response to successive acts of patting said doll, each said increment being less than said predetermined extent of movement.

8. A mechanism as defined in claim 7 wherein said movable member is a rotatable element and said actuator means is a pivoted lever; said lever being connected to said element by one-way drive means whereby oscillatory movements of said lever rotate said element in only one direction.

9. A mechanism as defined in claim 8 wherein said rotatable element comprises a cam engageable with said hammer.

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