

Jan. 18, 1966

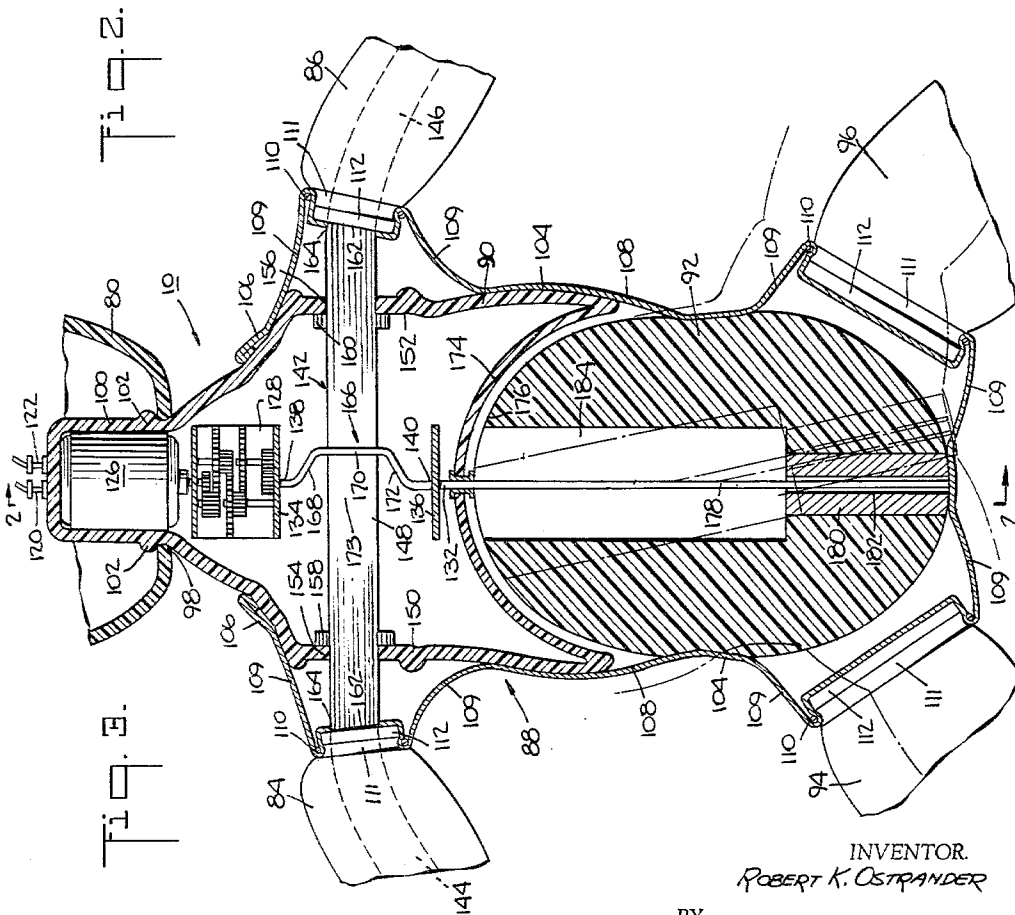
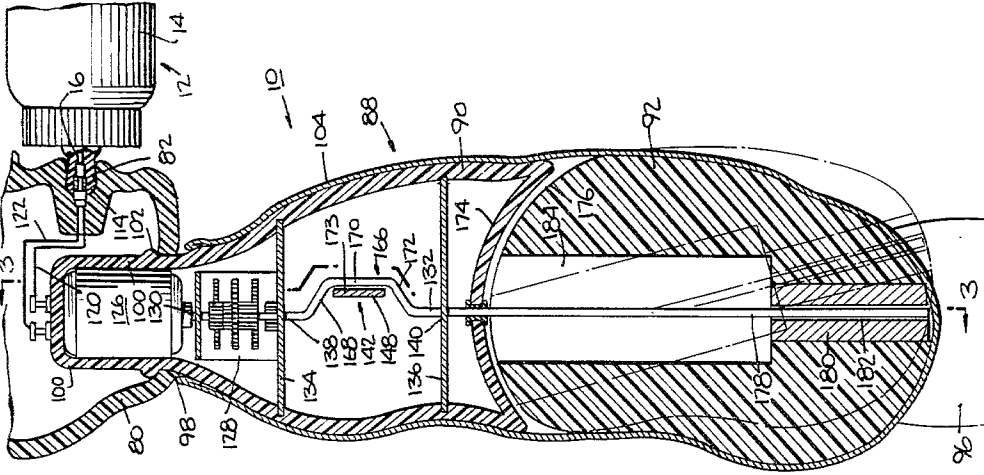
R. K. OSTRANDER

3,229,421

POWER OPERATED DOLLS

Filed Feb. 20, 1963

2 Sheets-Sheet 2



INVENTOR.
ROBERT K. OSTRANDER
BY
Kritschstein, Kritschstein & Ollinger
ATTORNEYS

1

3,229,421

POWER OPERATED DOLLS

Robert K. Ostrander, 497 Prospect St., Maplewood, N.J.

Filed Feb. 20, 1963, Ser. No. 260,005

13 Claims. (Cl. 46—247)

This invention relates to power operated dolls and in its preferred form to battery operated dolls.

It is an object of my invention to provide a power operated doll having an internal motor driven mechanism for imparting a function to the doll wherein the mechanism will be caused to operate in the course of a child's play with the doll without knowing manipulation of an electrical connection as an electric switch, push button or the like.

It is a further object of my invention to provide a power operated doll wherein the doll is caused to function by a child's use of a doll's lifelike accessory item in play with the doll, said item containing a concealed source of stored energy.

It is another object of my invention to provide a doll of the character described wherein a child by simulated feeding of the doll as through the use of a doll's feeding bottle can cause the doll to move in a humanoid manner imitative of the physical movements displaying pleasure effected by a baby when being fed.

It is a further object of my invention to provide a doll of the character described wherein the battery or other source of energy is external to the doll and is concealed from view yet is conveniently located for access for purposes of selectively replacing or recharging said battery or stored energy source.

It is a further object of my invention to provide a doll of the character described wherein the batteries or the like are located external to the doll to allow use of a standard doll body in a preferred embodiment of my invention.

It is another object of my invention to provide a doll of the character described wherein the batteries or the like are in a concealed position in a life-like accessory item which is natural for a child to use in connection with her play with said doll.

Battery operated dolls have been on the toy market for several years. Yet the problem of replacement or recharging of the batteries by a user of the doll has been long standing and unsolved by the designer. If a doll was to have its batteries supported in the interior of the doll torso, a specially designed and manufactured doll body had to be utilized which allowed access thereto. Not only was the cost of such a doll body increased but the replacer, the user of the doll, who wished to substitute fresh batteries or to recharge them if they were of the rechargeable type usually had to undress the doll to gain access to the opening in the doll body whereby to reach the batteries. Another disadvantage was that the illusion desired to be conveyed to a child wherein the doll was a life-like baby for play would be destroyed if a child visibly and physically realized that she (or her parents) had to change or recharge the batteries within the doll in order to keep the doll operating. The location of batteries within the doll made the procedure of getting to them complicated and destructive of the esthetic aspects of the doll.

When these batteries were occasionally incorporated external to the doll, they were ungainly and usually a cord or a flex cable led from a box containing such batteries to the doll, and an electrical switch or push button was mounted on the box to control operation. Although battery replacement thereby was simplified, a new problem was created because the batteries or their containing box and electrical switch could now readily be seen

2

by the user, destroying the desired and intended life-like illusion for the doll. To solve these various problems I have incorporated batteries or other source of stored energy, e.g. a windup spring motor, in a container which is disguised to simulate a doll's lifelike accessory item which is natural for use by a child in playing with said doll. A preferred embodiment of this accessory item is a baby's feeding bottle.

It is a further object of my invention to provide a doll of the character described wherein batteries or the like are contained in a doll's accessory item which also functions to provide an electrical connection or mechanical coupling to operate the mechanism within said doll without visible power apparatus external to the doll. My invention preferably contemplates providing a container for batteries, disguising said container as a life-like accessory item for a child's natural play with a doll and also having concealed within the container and the doll the necessary electrical connections so that when an accessory item is appropriately used according to its imitative function with my doll, a utilization mechanism internal of the doll for providing a function to the doll will be energized.

Thus it is a further object of my invention to provide a doll of the character described wherein a child playing with my accessory item and my doll will naturally join (couple) such two items in normal play and thereby cause operation of the doll. This use will not only provide pleasure for the child but in addition will complete an appropriate electrical connection to actuate the motor driven utilization mechanism in my doll, which mechanism will impart a function to such doll. In other words, the child will complete an electrical connection without knowing it; the doll will be caused to operate while preserving its humanoid illusion.

It has been long known by artisans in the toy art, and particularly in the doll field, that a motor driven mechanism within a doll is capable of giving to the doll a wide variety and versatility of functions. The doll designer is aware that when he is allowed to place a motor driven mechanism within a doll, a wide range of mechanical functions are open for him to impart to the doll, for example, speaking, crying, changing facial expressions, crawling, walking, movement of the arms and the like. He need not in this way depend upon inertial or windup mechanisms or squeeze-operated mechanisms in the doll upon which to base actuation of the doll. Designers have been long inhibited in their full development of this concept, based primarily upon the necessity for finding a suitable location for batteries somewhere in the doll.

Such batteries are of relatively small size and capacity and must be replaced or recharged upon occasion in order to continue the desired functioning of the doll. Such batteries are often of the small flashlight variety and because of contemplated excessive usage of the doll for long periods of play time, the changing or recharging of such batteries is not infrequent. Likewise if the batteries are of the rechargeable type, the batteries must be located so that the recharging thereof from a power outlet can be conveniently done.

Upon the foregoing considerations, I have placed my batteries in a hollow container imitative of a baby's feeding bottle as a desirable form of an accessory item which a child would naturally use in play with her doll. The batteries are thus hidden from view, and the esthetic and non-mechanical attributes of the doll are maintained. The use of such a lifelike accessory item as a container for the batteries allows me another advantage. The accessory item not only houses the batteries, but its physical coupling in play with the doll is the manipula-

tive step by which the batteries are enabled to supply energy to the motor within the doll. Thus, in the illustrated embodiment herein, when the bottle is applied to the doll's mouth, a twin electrical connection is thereby made and the intended function imparted to the doll via its internal actuative mechanism.

To further heighten the illusion created by my invention, I have found it desirable to impart movements to the doll's arms, legs and torso which suggest the stirring of a small child when being fed. Such movements desirably will occur only when the feeding bottle is placed to the doll's mouth, and are warmly suggestive to the child of a baby's physical movements manifesting enjoyment and satisfaction from such feeding. Sufficient power is supplied, as with the aid of a reduction gear train, to prevent the action, i.e. movement, of the doll's torso from being easily stopped so that the torso will continue to shift about even when the child grasps or hugs the doll in a manner tending to impede such movement. Even if the child holds the doll firmly enough to restrict such movement, she will still feel the doll stirring in her arms in a lifelike manner. Moreover the arms are driven through a yieldable element so that even if they are held still while the motor continues to operate leakage will be avoided.

Other objects of my invention in part will be obvious and in part will be pointed out hereinafter.

My invention accordingly consists in the features of construction, combinations of element and arrangements of parts which will be exemplified in the doll and related accessory item hereinafter described, and of which the scope of application will be indicated in the appended claims.

In the accompanying drawings, in which I have shown one of the various possible embodiments of my invention.

FIG. 1 is a full length view of my doll showing a child's hand inserting my battery-containing baby's feeding bottle into the doll's mouth;

FIG. 2 is a front-to-back cross-sectional view of my doll taken along the longitudinal center line thereof as indicated by the line 2—2 of FIG. 3, and showing my baby's feeding bottle inserted into the doll's mouth;

FIG. 3 is a cross-sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is a perspective view of my doll actuating mechanism;

FIG. 5 is a view showing my baby's feeding bottle in partial section and near the sectionally illustrated mouth cavity of my doll;

FIG. 6 is a schematic circuit of the rechargeable battery pack incorporated in my baby's feeding bottle;

FIG. 7 is an exploded view of said battery pack and the bottom of the feeding bottle; and

FIG. 8 is an enlarged sectional view of the electrical coupling means for effecting a simple push twin connection between the power leads in the feeding bottle and the power leads in the doll's mouth cavity.

To achieve the several objects of my invention in the preferred embodiment thereof I utilize a standard doll in which I have placed a motor driven mechanism that is designed and constructed to impart a function to the doll. This mechanism is actuated by an electric motor likewise disposed within the doll and connected by circuit means to an electrical twin connector in the mouth cavity in the head of the doll.

As my battery-carrying accessory item I utilize in the shown embodiment a container imitative of a baby's feeding bottle having secured in the interior thereof a battery and providing means for allowing selective access to the interior of the container and to such battery when it is desired to change or recharge the same. In the tip or nipple imitative portion of my baby's feeding bottle I mount a first electrical twin connector which is connected by circuit means to said battery. When the baby's

feeding bottle with its tip is inserted into the mouth cavity in the doll the electrical twin connector in the nipple and a second electrical twin connector in the mouth cavity are interengaged to close both legs of an electrical circuit causing electrical energy to flow from the battery into the electric motor so as to activate the internal mechanism of said doll and thereby to impart a desired function to the doll.

In lieu of the battery in the detachably couplable container and the electric motor in the doll, I may provide a windup spring motor in said container which motor drives one half of a detachably interengageable connector the other half of which is mounted on the doll and drivingly engages the motor driven mechanism, the two halves of the connector being interengaged when the container is coupled to the doll, e.g. the tip of the bottle inserted between the parted lips of the doll.

Referring now in detail to the drawings, the reference numeral 10 denotes a doll embodying the present invention and the reference numeral 12 denotes a container imitative of a baby's feeding bottle for use with said doll.

It will be realized by artisans skilled in the doll trade upon a reading and understanding of the disclosure herein that containers in various forms of doll's lifelike accessory items can be used for the purposes discussed and shown. It is to be understood that the term "lifelike accessory item" encompasses a multitude of merchandise items possessed by adults for household, entertainment or sport use and which artisans in the doll trade would envision to be natural items (in scaled dimensions) for a child's play with her doll. I have found a baby's feeding bottle to be a useful and attractive embodiment of the accessory item concept of my invention. However, it will be fully appreciated that there are many other objects which can be used for like purposes. For example, the container may be in the form of a doll's plaything such as a doll's handbag which will make an appropriate electrical connection when said handbag is placed on the doll's arm or hand. The container also may be in the form of a cigar or pipe, ice cream cone, or candy cane, all of which will actuate said doll when such an object is placed to the doll's mouth. Another embodiment of this aspect of my invention would be the utilization of a container in the form of a fishing rod with the battery contained in the handle of said rod. These illustrations demonstrate that my invention is designed to encompass the placement of a battery or batteries or other suitable source of stored energy in any lifelike accessory item which would be naturally coupled to the doll by a child playing with her doll.

Turning first to the detailed construction of the baby's feeding bottle, the structure thereof is best seen in FIGS. 5, 6, 7 and 8. My baby's feeding bottle 12 is designed and constructed to have a configuration generally imitative of standard baby's feeding bottles. The bottle has a hollow, thin-walled body portion 14 and a nipple imitative protuberance or tip 16. The bottle is preferably formed from a thermoplastic synthetic material, as by injection molding, thereby imparting to the bottle the qualities of lightness, durability and strength with some resiliency, of being pleasantly colored in manufacture and of being washable.

A battery secured within the interior of the body portion is provided to supply electrical energy to the doll and means is provided to give selective access to the interior of the container and thereby to the battery. Although one or two replaceable batteries may be secured within the bottle by simple mechanical means as by spring clips, I have shown placed within the body portion 14 a removable rechargeable battery pack 18 which has a housing 20 of such contour and dimension that it is frictionally engaged within the bottom interior portion of the bottle. The use of such housing provides means giving selective access to the battery pack. The housing 20 contains rechargeable batteries 21 and a related cir-

cuit. The housing 20 has a rear end wall 22 with a peripheral flange 24 thereon which serve as the exterior bottom face of the bottle and act to properly position the pack 18 in the bottle interior. Protruding from the front end wall 25 of the housing 20 internally into the bottle interior are two parallel male prongs 26 of the type which will readily fit into a home A.C. electrical power outlet. Adjacent the male prongs on the front end wall 25 of the housing are mounted two female electrical receptacles 28. Fixed within the interior of the body portion 14 of the feeding bottle is a transversely disposed interior wall 32 having two apertures 30 there-through. When the pack 18 is held within the body portion 14, the front end wall 25 of the housing 20 is adjacent the interior wall 32. Two electrically conductive pins 34 are carried by this interior wall and extend therefrom toward the battery pack 18. The apertures 30 and the pins 34 on the interior wall 32 are positioned to align respectively with the prongs 26 and the receptacles 28 carried by the housing 20 on the front end wall 25, so that when the housing 20 is held within the body portion 14 in a position in which the prongs 26 pass through the apertures 30, the receptacles 28 will engage the pins 34.

FIG. 6 shows the schematic diagram of the electrical and mechanical components discussed above. The components appearing inside of the rectangular dotted line 36 in FIG. 6 are all held within the housing 20. These include two rechargeable batteries 21 connected in parallel. A lead 38 runs from one terminal 40 of the one battery 21 to a similarly poled terminal 42 of the second battery. From the terminal 42 a lead 44 runs to a junction 46. From this junction a lead 48 runs to one female electrical receptacle 28. A further lead 50 runs from said junction 46 to a similarly poled D.C. terminal of a charging rectifier-transformer 52.

Proceeding now to the opposite side of the circuit, a lead 54 runs from the second terminal 56 of one battery 21 to the second terminal 58 of the other battery 21. A lead 60 runs from the terminal 58 to a junction 62. From said junction 62 a lead 64 runs to a similarly poled D.C. terminal of the charging rectifier-transformer 52. A lead 66 runs from the junction 62 to the second female electrical receptacle 28.

A two-lead electrical connector, such as a two-contact coaxial electrical socket 72 is located and mounted within the tip 16 of the bottle so that said connector is substantially concealed (not noticeably visible); and circuit means are provided to connect the batteries 21 to this socket. Lead wires 68, 70 run from the pins 34 internally of the body portion 14 to the electrical socket 72 within the tip 16. The socket 72 is a female electrical receptacle of a standard type as shown most clearly in FIG. 8 and opens, i.e. faces, forwardly. Lead wire 68 runs to the inner small diameter electrically conductive sleeve 74 of the socket 72 while lead wire 70 runs to the exterior large diameter electrically conductive open-ended shell 76 of the receptacle. The sleeve 74 is disposed coaxially of the shell 76 and extends rearwardly thereof. The sleeve and shell are electrically insulated from one another and held in their described mutual relationship by a spacer 78 of electrically insulating material.

Turning now to the doll 10, the same includes a head 80 with natural features of eyes, nose and mouth thereon, the latter including a flexible mouth cavity 82. The head preferably is made of a soft material, e.g. a dead soft polyvinyl chloride in order to obtain a flexible mouth cavity. The doll has limbs including a right arm 84 and a left arm 86, and a torso 88 including an upper torso portion 90 and a lower torso portion 92. The doll further includes a right leg 94 and a left leg 96. The torso and limbs are stiff yet resilient and are desirably molded from a synthetic thermoplastic material such being well known and common practice in the doll industry. The doll's head 80 has a neck orifice 98 which is mounted

on a hollow upright protuberance 100 unitary with the torso which by means of an annular retaining rib 102 on the protuberance rotatably holds the head onto the torso.

A sheath 104 encompasses major portions of the torso 88 including the upper torso portion 90 and the lower torso portion 92. The sheath is preferably made of a flexible limp material such as fabric. The sheath is the means by which the various limbs are loosely and articulately joined to the torso 88. For this purpose the sheath has extensions 109 in the form of short hollow tubes at each of the shoulder areas and hip areas of the torso. Spring metal rings 110 are used in conjunction with the sheath extensions 109 and annular grooves 111 in cylindrical members 112, one cylindrical member being included in each limb at the proximal end thereof. Each ring 110 clamps a terminal portion of its affiliated sheath extension into the associated groove 111 thereby flaccidly joining the limbs to the doll body. A joint of the type preferred for use herein is more fully disclosed and is claimed in my copending application, Serial No. 118,381, filed June 20, 1961.

A length of flexible malleable metal wire may be used in place of each spring ring 110. In this case the wire is somewhat longer than the ring 110 and is tightened about the member 112 simply by twisting its two ends together until the desired tension necessary to secure the sheath extension 109 to the cylindrical member 111 is achieved.

An electrical connector such as a twin-contact male plug 114 is mounted to extend forwardly within the mouth cavity 82 and is constructed and arranged selectively to mechanically engage and electrically connect to the twin-contact electrical socket 72. Due to its location in the mouth cavity the plug is substantially concealed (not noticeably visible). The plug 114 has a small diameter electrically conductive central tongue 116 and a larger diameter electrically conductive cylindrical base 118. The tongue 116 and the base 118 are coaxially disposed, the tongue protruding forwardly from the base. The tongue and base are insulated from one another and held in the described relationship by a spacer 124 of electrically insulative material.

The exterior diameters of the tongue 116 and the base 118 are respectively matched to the interior diameters of the sleeve 74 and the shell 76 of the socket 72, and the axially spaced relationship of the tongue to the base is complementary to the axially spaced relationship of the sleeve to the shell. When the nipple is inserted into the mouth cavity the plug 114 thereby is inserted into the socket 72 so that there is frictional engagement and electrical connection between the sleeve 74 and the tongue 116 and, insulated therefrom, similar contact between the shell 76 and the base 118.

Within the torso and conveniently within the hollow protuberance 100 is mounted a miniature D.C. electric motor 126. Circuit means connects the electrical male plug 114 to the motor 126. A lead wire 120 runs from the base 118 to one terminal of the motor, and a lead wire 122 runs from the tongue 116 to the other terminal of the motor.

Means engages the motor to at least one limb. An appropriate gear reduction (transmission) mechanism 128 is directly coupled to the output shaft 130 of the motor. A drive shaft 132 extends downwardly from the gear reduction mechanism into the torso of the doll. The drive shaft 132 is rotatably supported by two spaced brackets 134, 136 in the torso of the doll, said brackets having aligned holes 138, 140 in which the shaft is journaled. The bracket 134 also supports the gear reduction mechanism 128. As seen in FIGS. 2 and 3 the drive shaft extends through the upper torso portion 90 and into the lower torso portion 92.

Means connects the power actuated mechanism within the doll to a limb to impart movement thereto. Said means includes an elongated member in the form of a

leaf spring 142 that extends transversely across the torso and has terminal portions 144, 146 respectively within and engaging each of the arms 84, 86. The leaf spring includes an intermediate forwardly humped portion 148 disposed internally of the torso between opposite side walls 150 and 152 at the shoulder areas. The leaf spring has a curved W-shape, as shown in full lines in FIG. 4 being so configured that when relaxed (unstressed) the doll's arms 84 and 86 are held slightly forwardly by the winged terminal portions 144, 146 of the spring as shown in full lines in FIG. 1. The leaf spring 142 passes through vertical slots 154, 156 in the torso side walls 150, 152. Adjacent these slots internally of the torso the leaf spring has shoulder protruberances 158, 160 which serve to retain the leaf spring within the torso and to prevent undue longitudinal displacement of said spring. A vertical through slot 162 is disposed in the closed proximal end of each of the cylindrical members 112 and an aligned vertical through slot 164 is disposed in the shoulder area of the limp sheath 104 adjacent the cylindrical members 112 affiliated with the doll's arms to allow the terminal portions 144, 146 of the leaf spring 142 to pass from the shoulder areas of the doll into the arms 84, 86 of the doll.

Cam means is on the drive shaft 132 to cause oscillation or forward and back rocking of the intermediate humped portion 148 of the leaf spring 142 so that when the drive shaft is rotated by the electric motor 126 the terminal portions 144, 146 of the leaf spring 142 are reciprocally flexed or rocked. The cam means comprises an offset crank section 166 of the drive shaft 132 located in the upper torso portion 90. The offset crank section includes a short radial portion 168 which is unitary with the shaft and is inclined to the longitudinal axis thereof. A somewhat longer vertical portion 170 parallel to the axis of rotation of the shaft is radially displaced therefrom and is joined to the short portion 168. A further short radial portion 172 is joined to the vertical portion 170 and is inclined to rejoin the longitudinal axis of the drive shaft 132.

The vertical portion 170 of the offset crank section describes a cylindrical path when the drive shaft 132 is rotated by the electric motor 126. The leaf spring is so positioned in relation to the intermediate portion 148 that the central segment 173 of said humped intermediate portion 148 in its relaxed position intersects the path described by the rotation of the vertical portion 170 of the offset crank section 166, whereby the offset crank section in its rotation will for at least part of that rotation variably depress the central segment of the leaf spring.

As best seen in FIG. 4, the relaxed shape of the leaf spring, shown in full lines in FIG. 4, in a preferred embodiment of my invention is so configured as to follow three reversed turns. Starting from any end of the leaf spring, the leaf spring through about the first third of its length (a terminal portion 144 or 146) describes a forwardly concave path, in its middle third the spring describes a forwardly convex path (the humped intermediate portion 148) and for its last third the leaf spring again describes a forwardly concave path.

The torso 88 includes the upper torso portion 90 and the lower torso portion 92. Means is provided to swiveledly join these two torso portions. To this end the bottom wall 174 of the upper torso portion is shaped to define a downwardly facing concavity that comprises substantially the entire bottom wall and is of a segmentally approximately spherical shape. The lower torso portion 92 has its top wall 176 in the form of an upwardly facing convexity that matches in dimension and contour the concavity of the bottom wall 174. The concavity and the convexity heretofore mentioned serve as a swivel joint for relative motion between said torso portions, the sheath 104 loosely mating these portions to effectuate said swivel joint and thereby allowing the upper and lower torso

portions to move relative to one another within the sheath envelope.

The lower torso portion 92 has the shape of the lower part of an infant's body. In my preferred embodiment, the lower torso portion is made of a foamed plastic material which has been molded to the desired shape. However, my invention also may be carried out by fabricating the lower torso portion 92 as a suitably shaped hollow shell of thermoplastic material. The motor operated drive shaft 132 extends deeply into the lower torso portion 92. Initiating at approximately midway through said lower torso portion the drive shaft has an offset portion which is a drive shaft extension 178 unitary with the shaft and inclined to its longitudinal axis. The extension 178 describes a conical downwardly flaring path when the drive shaft 132 is rotated.

Collar means is provided to impart oscillating movement from the drive shaft extension 178 to the lower torso portion 92. The collar means constitutes a cylinder 180 having a narrow through bore 182 on its longitudinal axis, said cylinder being fixedly secured within the bottom of the lower torso portion 92. The through bore 182 is of a diameter slightly greater than the diameter of the drive shaft extension 178. The drive shaft extension 178 is disposed within the bore and is free to rotate in relation thereto, so that the cylinder 180 follows the conical path of the drive shaft extension 178 when the drive shaft 132 is rotated. A cylindrical well 184 is formed in the lower torso portion 92 above the cylinder 180 in order to clear the eccentric path of the extension 178 and the drive shaft as said shaft turns.

In operation, the baby's feeding bottle 12 serves as the power source for the operation of my doll. Ordinary dry cell batteries may be used within the bottle, or, if desired, I may employ a rechargeable battery unit, utilizing, for example, nickel cadmium batteries. When it is desired to recharge such batteries the housing 20 of the rechargeable battery pack 18 is removed from the body portion 14 of the bottle by conventionally gripping and pulling the end wall 22 of the housing, which housing is held in the bottle end interior by frictional engagement. Thereafter the male prongs 26 of the housing 20 are plugged into an A.C. outlet in the home. A.C. current is thereby led from the home source through the prongs 26 into the charging rectifier-transformer 52. This unit then provides a charging voltage to the batteries 21 causing them to be recharged.

When sufficient time has been allowed to recharge the batteries, the housing 20 with its prongs 26 is removed from the house outlet and replaced in the interior of the body portion 14 of the bottle 12 where the housing 20 is held in frictional engagement. The apertures 30 in the interior wall 32 of the housing are entered by and guide the male prongs 26 so as to properly align the receptacles 28 on the housing 20 with the pins 34 on the internal wall 32. In addition, the flange 24 by contacting the walls of the body portion stops the housing when it has entered into the body portion 14 to a proper depth.

After the housing 20 is replaced in the body portion 14 of the bottle, voltage is thereby applied from the batteries 21 to the female receptacles 28. The male pins 34 electrically contact the female receptacles 28 and through the lead wires 68, 70 are electrically connected to the forwardly facing female twin-contact socket 72 which is located and mounted in the tip 16 of the bottle. When the housing 20 is within the bottle 14, the charging prongs 26 no longer serve as part of the operative circuit.

Within the mouth cavity 82 of the doll the recessed twin-contact male plug 114 is constructed and arranged to be engaged by and be electrically connected to the recessed female socket 72. By placing the tip of the bottle 12 in the mouth cavity 82 of the doll, the child easily, automatically and conveniently makes the necessary electrical connection by engaging and electrically connecting the socket 72 (which is facing forwardly from the

tip 16 of the bottle) to the male plug 114 (which is in the mouth cavity 82 facing outwardly from the doll).

It will be appreciated from the foregoing description that the tip 16 of my doll's baby's bottle 12 has mounted within it a female electrical connector (a socket) 72 which is hidden from view in the tip. The mouth cavity 82 of my doll has mounted within it, and also concealed from view by virtue of its depth in the cavity, a male electrical connector (a plug) 114. When the bottle tip 16 is placed into the mouth cavity 82 of the doll, the mentioned electrical connections thereby are simultaneously connected. The lead wires 120, 122 run from the male plug 114 to the electrical motor 126 and carry electrical energy thereto. Power is thus supplied from the batteries to the interior of the doll. The same principle may be readily utilized when a different type of lifelike accessory item as a cigar, an ice cream cone or a candy cane is placed to the mouth cavity of a doll suitable for use therewith.

The gear reduction mechanism 128 connected to the output shaft 130 of the motor 126 slows down the rotation of the drive shaft 132 so that it will actuate the doll at a rate sluggish enough to imitate the movements of an infant's limbs and body. The gear reduction mechanism also provides mechanical advantage from the electrical motor 126 to the drive shaft 132 so that this shaft will rotate and overcome restrictive pressure applied by a child who is grasping or hugging the doll while it is operating. As the drive shaft turns the offset crank section 166 presses rearwardly against the central segment 173 of the intermediate forwardly convex humped portion 148 of the leaf spring 142, the shoulder protuberances 158, 160 in connection with the slots 154, 156 in the side walls 150, 152 of the torso act as pivot means about which the leaf spring will rock or oscillate. Accordingly when the center of the leaf spring is forced backwards the concave terminal portions 144, 146 of the leaf spring 142 are rocked forwardly. As the offset section 166 subsequently rotates forwardly the normal W (triple-curved) shape of the leaf spring at repose will be gradually resumed. Thus, as shown in the solid and dotted lines in FIG. 4, the terminal winged portions of the leaf spring will be oscillated or rocked forwardly and backwardly by rotation of the offset section 166, and the arms 84, 86 secured to the terminal portions 144, 146 of the leaf spring loosely joined to the torso will correspondingly reciprocally move forwardly and backwardly. The flaccid sheath extensions 109 in the shoulder areas of the torso allow relatively free arm movement. Due to the flexible nature of the leaf spring, a smooth motion (rather than a jerky mechanical movement) will be transmitted to the arms. This arm motion is shown in the solid and dotted lines outlining the arms in FIG. 1. In addition, the arms can be manually moved by a child when the mechanism within the doll is or is not battery actuated. The spring is strong yet flexible so that the child can freely move the arms back and forth against the force of the spring without exceeding its elastic limit thereby permitting excessive handling of the arms and even stoppage thereof while the motor is running without harming the doll.

Upon a child's feeding the doll with the described feeding bottle it will appear to him that the baby's arms are moving in a grasping or hugging manner as if the child were happy and responsive to the feeding action being carried on by the child.

As the arms are moved by the motor in the manner above described, the lower torso portion 92 is slowly swivelled in synchronism to shift the doll's body on its horizontal support and thereby imitate the languorous body stirring of a contented infant during bottle feeding. Swivelling of the lower torso portion will also impart movement to the flaccidly attached legs. Because of the gear reduction mechanism, there is sufficient power supplied to the movable torso part so that if the child hugs or grasps the doll with sufficient strength to restrict motion while power is being supplied thereto, the doll will stir in his arms and thereby impart a feeling of life.

It thus will be seen that I have achieved the several objects of my invention and have adapted my device to meet the conditions of practical use.

As various possible embodiments might be made of the above invention and as various changes might be made in the embodiment above set forth, it is to be understood that all matters herein described or shown in the accompanying drawings are to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and useful, and desire to secure by Letters Patent:

1. For use with a child's doll having a head and having an internal motor driven mechanism for imparting a power actuated function to a doll, that improvement comprising: a hollow container, said container having the outward configuration of a doll's lifelike accessory item designed and constructed for natural use in a child's play with said doll, said container having a tip, a two terminal battery secured within said container, a first electrical twin-contact connector mounted on said tip, circuit means connecting the two terminals of said battery to said first twin-contact connector, an electric motor within the doll arranged to drive said mechanism so as when energized to impart said function to the doll, a mouth cavity recessed in the head of said doll, said cavity being shaped to match the shape of the tip of the container and to snugly receive the same, a second electrical twin-contact connector mounted in the mouth cavity and concealed from view therein, said second twin-contact connector being constructed and arranged to selectively engage and electrically connect to said first twin-contact connector when the top of the container is inserted into the mouth cavity by a child's manipulation that couples the container to the doll, said first twin-contact connector being then located within the mouth cavity wholly concealed from view therein, and circuit means connecting said second twin-contact connector to the terminals of said motor so that only when the tip of the container is placed into the doll's mouth the battery supplies electrical energy to said motor for energization thereof.

2. The improvement as set forth in claim 1 wherein the container has the outward configuration of a baby's feeding bottle and wherein the tip of the container is a nipple imitative portion of the bottle.

3. In a doll having a head with a mouth cavity, a torso and four limbs comprising two arms and two legs, the combination of a two-terminal electric motor within the doll, means engaging said motor to both arms, said arms being articulatedly connected to the torso whereby to impart movement to said arms when said motor is energized, said engaging means including an elongated leaf spring extending transversely of the doll, said spring being pivoted on the torso at both sides thereof, having each of its terminal portions located within a different arm, and having an intermediate portion located within the torso, a drive shaft connected to said motor and having cam means thereon, said cam means being arranged to operatively contact said intermediate portion of the spring whereby to oscillate the intermediate portion of the spring when said drive shaft is rotated so that the terminal portions are reciprocally oscillated to impart movement to the arms, a hollow container, said container having the outward configuration of a baby's feeding bottle and being constructed and arranged with a bottle imitative body portion and a nipple imitative tip, said tip having a cavity therein, a two-terminal battery secured within said body portion, a first electrical twin-contact connector mounted on said tip, circuit means connecting the two terminals of the battery to said first twin-contact connector, said mouth cavity being recessed into the head of the doll, said cavity being shaped to match the shape of the tip of the container and to snugly receive the same, a second electrical twin-contact connector mounted in the mouth cavity and concealed from view therein, said second twin-contact connector being constructed and arranged to be selectively engaged with and to be electrically connected to said first

twin-contact connector when the tip of the container is inserted into the mouth cavity by a child's manipulation that couples the container to the doll, said first twin-contact connector being then located within the mouth cavity wholly concealed from view therein, and circuit means connecting said second twin-contact connector to the two terminals of said motor, so that only when the nipple of the toy baby's bottle is placed into the doll's mouth the battery supplies electric energy to said motor whereby said engaging means imparts movement to said arms.

4. The combination as set forth in claim 3 wherein the cam means comprises an offset crank section which traces a substantially cylindrical path when said drive shaft is rotated, said shaft being positioned in relation to the intermediate portion of the spring so that the offset crank section variably depresses said intermediate portion whereby to oscillate the intermediate portion when said shaft is rotated so that the terminal portions are reciprocally oscillated to impart movement to the engaged arms.

5. In a doll having a torso and having arms articulately connected to the torso, the combination of a motor within the doll, means engaging said motor to both arms, said means including an elongated substantially W-shaped leaf spring pivoted at the sides of the torso having each of its terminal portions within a different engaged arm and having an intermediate forwardly humped portion within the torso, a drive shaft connected to said motor, cam means on said drive shaft, said cam means comprising an offset crank section which traces a substantially cylindrical path when said drive shaft is rotated, said shaft being positioned in relation to the intermediate portion so that the offset crank section variably depresses said intermediate portion whereby to oscillate the intermediate portion when said shaft is rotated so that the terminal portions are reciprocally oscillated to impart movement to said arms when said motor is energized.

6. The combination of a doll having a head with a mouth cavity and a torso, said torso including an upper torso portion and a lower torso portion, means swivelly joining said upper torso portion and said lower torso portion, an electric motor within the doll, means engaging said motor to said lower torso portion whereby to impart swivelling movement to said lower torso portion when said motor is energized, said engaging means including a drive shaft, said drive shaft having an offset portion, collar means rotatably mounted on said offset portion and secured to said lower torso portion, a hollow container, said container having the outward configuration of a baby's feeding bottle formed with a bottle imitative body portion and nipple imitative tip, a terminal battery secured within said body portion, a first electrical twin-contact connector mounted on said tip, circuit means connecting the two terminals of said battery to said first twin-contact connector, said mouth cavity being recessed in the head of the doll, said cavity being shaped to match the shape of the tip of the container and to snugly receive the same, a second electrical twin-contact connector mounted within the mouth cavity and concealed from view therein, said second twin-contact connector being constructed and arranged to be selectively engaged with and to be electrically connected to said first twin-contact connector when the tip of the container is inserted into the mouth cavity by a child's manipulation that couples the container to the doll, said first twin-contact connector being then located within the mouth cavity wholly concealed from view therein, and circuit means connecting said second twin-contact connector to the terminals of said motor so that only when the tip of said container is placed into the doll's mouth the battery supplies electrical energy to said motor whereby said engaging means imparts swivelling movement to said lower torso portion.

7. The combination as set forth in claim 6 wherein the offset portion is an extension of the drive shaft inclined to the axis of rotation of said shaft, said extension de-

scribing a downwardly flaring conical path when the shaft is rotated.

8. The combination as set forth in claim 7 wherein the means swivelly joining said upper torso portion and said lower portion includes a sheath encompassing major portions of the doll torso.

9. The combination as set forth in claim 8 wherein the upper torso portion has a bottom wall substantially comprising a downwardly facing concavity of segmentally approximately spherical shape, and wherein the lower torso portion has a top wall substantially comprising an upwardly facing convexity of segmentally approximately spherical shape, said concavity and convexity being of matched dimension and contour, said sheath mating said concavity and convexity whereby to effect a swivel joint.

10. The combination of a doll having a torso including an upper torso portion and a lower torso portion, said upper torso portion having a bottom wall substantially comprising a downwardly facing concavity of segmentally approximately spherical shape, and said lower torso portion having a top wall substantially comprising an upwardly facing convexity of segmentally approximately spherical shape, said concavity and convexity being of matched dimension and contour, means swivelly joining said upper torso portion and said lower torso portion, said means including a sheath encompassing major portions of the doll torso and mating said concavity and convexity, a motor within the doll, means engaging said motor to said lower torso portion to impart swivelling movement to said lower torso portion when said motor is energized, said engaging means including a drive shaft having an offset portion, said offset portion being an extension of the drive shaft inclined to the axis of rotation of said shaft, said extension describing a downwardly flaring conical path when the shaft is rotated and collar means mounted on said extension and secured to the lower torso portion, said collar means being a cylinder having a through bore along its longitudinal axis, said drive shaft extension being disposed within said through bore.

11. In a doll having a head, a torso including an upper torso portion and a lower torso portion and arms articulately connected to the torso, the combination of a motor within the doll, means engaging said motor to both arms, said means including an elongated leaf spring pivoted at the sides of the torso and having each of its terminal portions within a different engaged arm and having an intermediate forwardly humped portion within the torso, a drive shaft connected to said motor and extending through said upper torso portion and through said lower torso portion, said drive shaft comprising an offset crank section, said section operatively contacting the intermediate portion of the leaf spring whereby to oscillate the intermediate portion of the spring when said drive shaft is rotated so that the terminal portions of the leaf spring are reciprocally oscillated to impart movement to the engaged arms, means swivelly joining said upper torso portion and said lower torso portion, said drive shaft having an offset portion within the lower torso portion inclined to the axis of rotation of said drive shaft and describing a downwardly flaring conical path when the shaft is rotated and collar means rotatably mounted on said offset portion and secured to said lower torso portion so that when the drive shaft is rotated a swivelling motion is imparted to the lower torso portion through the collar means.

12. A child's doll having a head and a movable part, an internal motor driven mechanism, means engaging said mechanism to the movable part of the doll to impart continuous cyclic movement thereto so long as said mechanism is driven, a hollow container completely separable from said doll, said container having the outward configuration of a baby's feeding bottle and being constructed and formed with a bottle imitative body portion adapted to be held in a child's hand and a nipple imitative tip, a two terminal battery secured within said container, a first

electrical twin-contact connector mounted on said tip, circuit means connecting the two terminals of said battery to said first twin-contact connector, an electrical motor within the doll arranged to drive said internal mechanism, a mouth cavity recessed in the head of the doll, said cavity being shaped to match the shape of the tip of the container and to snugly receive the same, a second electrical twin-contact connector mounted in the mouth cavity and concealed from view therein, said second twin-contact connector being constructed and arranged to be selectively engaged with and to be electrically connected to said first twin-contact connector when the tip of the container is inserted into the mouth cavity by a child's manipulation that couples the container to the doll, said first twin-contact connector being then located within the mouth cavity wholly concealed from view therein, and circuit means connected the second twin-contact connector to the terminals of said motor so that only when the tip of said container is placed into the doll's mouth, the battery supplies electrical energy to said motor which through said mechanism imparts continuous cyclic movement to said part.

13. A child's doll having a head, a body, two arms and two legs, an internal motor driven mechanism, means engaging said mechanism to the arms and body of the doll to impart continuous cyclic movement thereto so long as said mechanism is driven, a hollow container completely separable from said doll, said container having the outward configuration of a baby's feeding bottle and being constructed and formed with a bottle imitative body portion adapted to be held in a child's hand and a nipple imitative tip, a two terminal battery secured within said container, a first electrical twin-contact connector mounted on said tip, circuit means connecting the two terminals of said battery to said first twin-contact con-

5 nector, an electrical motor within the doll arranged to drive said internal mechanism, a mouth cavity recessed in the head of the doll, said cavity being shaped to match the shape of the tip of the container and to snugly receive the same, a second electrical twin-contact connector mounted in the mouth cavity and concealed from view therein, said second twin-contact connector being constructed and arranged to be selectively engaged with and to be electrically connected to said first twin-contact connector when the tip of the container is inserted into the mouth cavity by a child's manipulation that couples the container to the doll, said first twin-contact connector being then located within the mouth cavity wholly concealed from view therein, and circuit means connecting the second twin-contact connector to the terminals of said motor so that only when the tip of said container is placed into the doll's mouth, the battery supplies electrical energy to said motor which through said mechanism imparts a continuous cyclic movement to the arms and body.

References Cited by the Examiner

UNITED STATES PATENTS

2,194,537	3/1940	Adams	46—161
2,277,762	3/1942	Irenius	46—118
2,832,177	4/1958	Mueller	46—244
2,925,944	2/1960	Inserillo	46—119 X
2,945,321	7/1960	Carter	46—247
3,029,552	4/1962	Katz	46—119 X
3,053,008	9/1962	Pelunis	46—119

OTHER REFERENCES

Ernst: German application 1,118,673, printed February 4, 1956.

35 RICHARD C. PINKHAM, *Primary Examiner.*