

[54] **DOLL SIMULATING NATURAL SUCKING MOTION AND CONTROL DEVICE FOR SAME**

[76] Inventor: **Loris De Masi**, 34/A Via Brambilla, Pavia, Italy

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[58] **Field of Search**..... **46/141, 135 R, 247, 232, 46/118**

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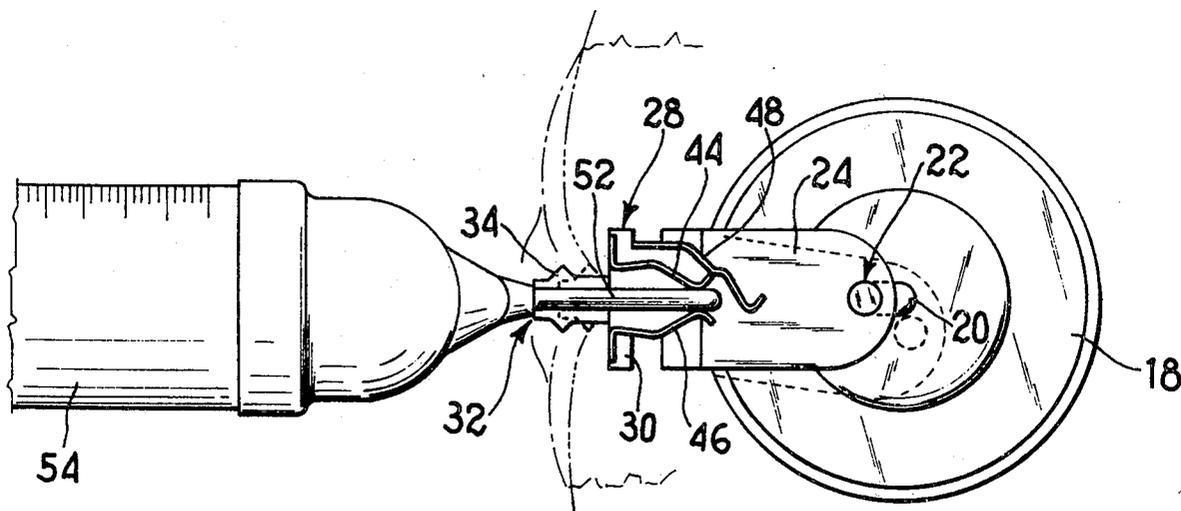
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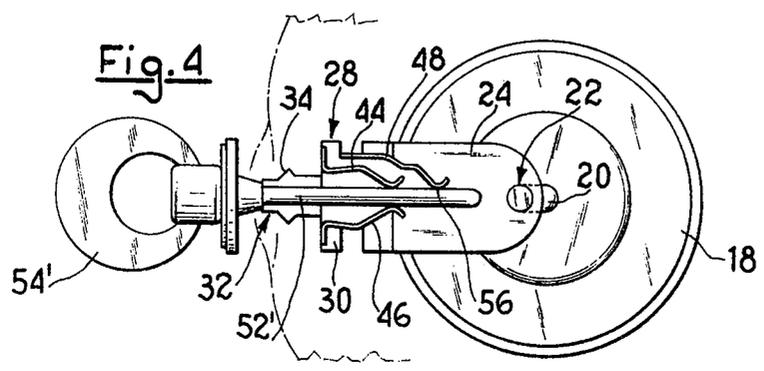
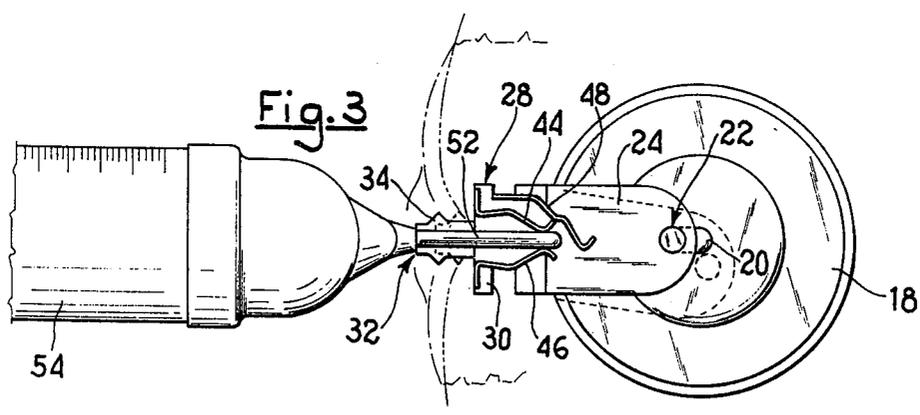
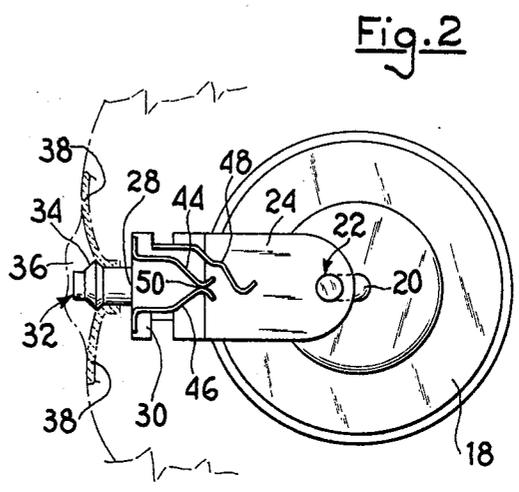
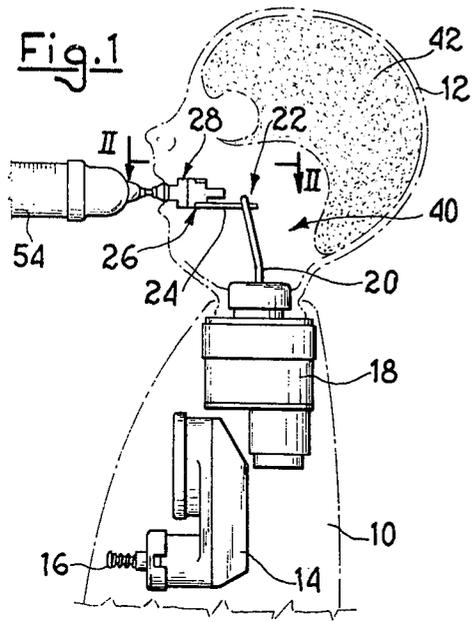
Primary Examiner—F. Barry Shay
Attorney, Agent, or Firm—McGlew and Tuttle

[57] **ABSTRACT**

A doll of elastically deformable material having a hollow head and chest connected at a hollow neck, said material permitting relative movement of the head and chest. A face part includes a mouth opening, normally recessed, and cheeks adjacent thereto. A geared electric motor within the chest adjacent the neck has a vertical output shaft rotated at low velocity. The shaft upper end forms a crank and rotates in a plane perpendicular to the principal axis of the doll adjacent the mouth level. A linkage is pivotally connected at one end of the cranks and at the other to a support plate. The plate is secured to a tubular element connected to the mouth opening. Energizing the motor reciprocates the linkage for reciprocal deformation of the mouth and adjacent face portions, and for relative movement of the head and chest. A sound reproducer in the chest simulates weeping noises and may be energized through a push button. The plate carries two normally engaged spring contacts in the sound reproducer circuit and a third spring contact in the motor circuit. A nipple simulating element inserted in the mouth spreads the two contacts, breaks the sound reproducer circuit and engages one of the two contacts with the third to close the motor circuit. Insertion of a longer element into the mouth opens both circuits.

4 Claims, 1 Drawing Figure





DOLL SIMULATING NATURAL SUCKING MOTION AND CONTROL DEVICE FOR SAME

BACKGROUND OF THE INVENTION

This invention relates to simulating natural sucking motions — such as those performed by a child or newborn baby — in a doll, puppet or the like, in particular having a well known design and structural arrangement of different doll body and head main components. This invention also relates to a doll, puppet or the like comprising mechanism adapted to carry-out these motions i.e. to controllably move pre-established zones of the doll head and body in order to simulate, with the highest possible approximation, the natural sucking motions of a child or newborn baby while swallowing e.g. a liquid sucked from a baby's feeding bottle, or other similar action.

SUMMARY OF THE INVENTION

Accordingly, an object of this invention is to simulate, in a doll or the like, the typical natural sucking motions with the highest possible approximation to reality and by means of inexpensive and simple devices, that do not require substantial changes in the design and production of already known dolls and puppets.

In order to attain this object, as well as the best simulation of such natural sucking motions, it was surprisingly found that, according to this invention, localized motions wholly simulating the natural motions can be obtained in a doll or the like having at least the face portion thereof in an elastically deformable material, e.g. plastics material as usually utilized in the production of such toys, when a small doll face zone, corresponding or directly adjacent to the doll mouth, is forced to perform reciprocating motions having a preset length, from the natural doll face position toward the inside of a doll head recess, and then back to the natural position, these motions being performed in a plane substantially perpendicular to the main longitudinal axis of the doll body. It has been ascertained that, in a doll or the like having a face portion conventionally designed and formed of elastically deformable material, the forced mouth motions are followed by the face zones adjacent thereto, and in particular by the cheeks, to a different extent according to the distance of the different face zones from the doll mouth, as well as to the design and structure of the face zones, in order to attain the required simulation effect. Moreover, the connection as usually provided between the head and body components of dolls and puppets as manufactured according to presently followed methods allows, under the reciprocating stresses, a limited relative movement between the doll head and chest, adapted to simulate the child chest natural motions, while swallowing a liquid.

According to this invention and with reference to dolls or puppets as conventionally manufactured and marketed, the doll head zones that must not follow the sucking motions, and in particular the cheek-bones, eyes, forehead and cranium, are advantageously locally stiffened by a preferably light and soft material that is suitably applied within the head recess to prevent even small undesired motions of such head zones.

According to a preferred embodiment of this invention, the reciprocating motions are obtained, e.g. by means of a small linkage, from an eccentric rotary motion controlled by suitable motor means, e.g. in the

form of a small electric motor, coupled to a reduction gear. This motor is controlled by an electric circuit including contact means adapted to close the circuit when a mechanical action is exerted thereon, e.g. by means of the elongated end of a baby's feeding bottle simulating toy, or the like, that is introduced into the doll mouth opening.

A doll according to this invention may comprise, besides the previously mentioned means and devices, already known means and devices to simulate the natural behaviour of a newborn baby, and in particular it may comprise a sound reproducer, e.g. simulating the weeping of a newborn baby, which reproducer is electrically deactivated concurrently with the starting of said sucking motions, as actually occurs.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic longitudinal section showing the upper body and head components of a doll or the like, comprising means and devices to simulate a sucking action according to this invention, as well as a sound reproducer.

FIG. 2 is a partial plan view, in section along the line II—II of FIG. 1, showing a sucking simulating device according to this invention, in an enlarged scale and in its rest position.

FIG. 3 is a view similar to that of FIG. 2 and showing the same device in its "on" position.

FIG. 4 is a view similar to that of FIG. 2 and showing the same device in a different position.

PREFERRED EMBODIMENT

FIG. 1 shows the chest 10 and the head 12 of a doll or puppet as conventionally produced, e.g. in an elastically deformable plastics material, head 12 being connected to the chest 10 in an already known manner, i.e. by mutual engagement of projections and recesses suitably formed in the chest and head components. A known sound reproducer 14, e.g. simulating the weeping of a newborn baby, can be fitted within the doll body in an already known manner and may be operated through a pushbutton 16 or the like.

According to this invention, the doll body houses a geared motor unit 18, e.g. in the form of a suitable battery fed electric motor and a reduction unit, adapted to reduce the motor RPM to a suitably low value at an output shaft 20.

Geared motor unit 18 may be suitably supported within the doll body, e.g. adjacent the neck thereof, in order to impart a reciprocating motion to the doll mouth and the doll face zones adjacent thereto. Accordingly, motor shaft 20 controls a circular, eccentric motion of a point 22 lying in a plane substantially perpendicular to the longitudinal middleline of the doll body and near the doll mouth. In the shown embodiment, circular eccentric motion of point 22 is obtained by suitably slanting the free end of shaft 20, but obviously it might be obtained by any other suitable means. In order to convert the rotary motion into a reciprocating and substantially straight motion, a linkage 24 acts as a connecting rod extending in such perpendicular plane and has one end pivotally connected with shaft 20 at point 22, while the opposite end of linkage 24 is connected, as at 26, with support and connecting means 28 directly joined to the doll mouth.

Support and connecting means 28 comprises a supporting plate 30, pivotally connected to linkage 24, as well as a substantially tubular element 32, rigidly se-

cured to plate 30 and adapted to be inserted into an orifice or opening formed in the doll mouth, tubular element 32 being connected with the mouth opening edges by a suitably shaped projection 34.

Accordingly, by energizing geared motor unit 18, a substantially straight reciprocating motion in a plane substantially perpendicular to the doll body longitudinal middleline and across the doll mouth, is imparted to support and connecting means 28. Such motion is identically performed by the doll mouth 36, starting from its natural position toward the inside of a recess 40 in the head 12, through a given length, and then back into such natural position, at a rate as established by the rotary speed of shaft 20 and obviously similar to the sucking rate of a child or newborn.

Due to the elastic deformability of the doll face material, reciprocating motion of doll mouth 36 is followed by other doll face zones and in particular by the cheeks 38, in a more or less greater extent, according to their distance from the mouth, the material thickness and the design of the zones, to perfectly simulate the required natural motions. Such a simulation is even more enhanced by the fact that at least a part of the reciprocating motion acts on the connection between the doll head 12 and chest 10, to cause a relative motion of these two components, simulating the child's motions as performed by the chest while swallowing a liquid.

To prevent the doll head zones which are to be kept at a standstill during sucking motions, from following the reciprocating motions of the above described device, these zones can be suitably stiffened, e.g. by a padding 42 of soft and light material, such as expanded polyurethane, expanded polystyrene, cotton wadding or the like, that is applied within the head recess 40.

Accordingly, the controlled reciprocating motions are performed only by the required doll face zones, e.g. as shown by dot-and-dash lines in FIG. 3, wherein the doll mouth and adjacent portions of doll cheeks are shown in their rest position and, respectively, in an intermediate position during a sucking step.

In order to control the motions, particularly in a doll comprising a sound reproducer 14, as shown in FIG. 1, support plate 30 supports contact means adapted to simultaneously control both the sound reproducer 14 and the geared motor unit 18. In particular, as shown in FIGS. 2 to 4, this contact means comprise a pair of blade contacts 44,46 to close and open the sound reproducer electric circuit, as well as a pair of blade contacts 44 and 48 for controlling the geared motor unit 18, contact 44 appertaining to both contact pairs. In their rest position, as shown in FIG. 2, the contact blades 44,46 are elastically urged toward each other and mutually engage in a point substantially aligned with the axis of tubular element 32. Accordingly, the circuit of sound reproducer 14 is closed and the weeping of a newborn baby or the like may be simulated, e.g. by pressing the pushbutton 16, while the geared motor unit 18 is inoperative, since the circuit thereof is kept open by the spaced apart contacts 44 and 48.

When an elongated control member 52, e.g. in the form of a stem-shaped end of a baby's feeding bottle toy, is inserted into the doll mouth opening and thus into the opening of tubular element 32, the stem-shaped end causes the contacts 44 and 46 to be spaced apart from each other and the sound reproducer circuit to be opened in order to discontinue the simulated weeping or the like. Simultaneously, the contact 44 engages with the contact 48 and closes the circuit of

geared motor unit 18, starting the previously described simulated sucking motions.

According to another feature of this invention, a second stem-like control member 52', e.g. associated with a baby's comforter toy 54' (FIG. 4), has an axial length greater than that of member 52 in order to act upon a suitably shaped portion 56 of contact 48 and space the same from contact 44. Accordingly, the circuit of the geared motor unit 18 is opened also and member 52' acts as a main switch to discontinue both the doll sucking and weeping actions, while the arrangement of contacts 44,46 and 48 allows to obtain the sucking motion only after the doll simulated weeping is discontinued, in conformity to what actually occurs.

While this invention has been described with reference to a preferred embodiment thereof, it is to be understood that many changes and modifications may be made therein without departing from the spirit and scope of the invention.

I claim:

1. In a doll including a hollow head and a hollow chest interconnected at a hollow neck, and formed of elastically deformable material permitting relative movement of the head and chest, the head having a face part including a mouth opening portion, having a natural position somewhat recessed into the hollow head, and cheeks adjacent the mouth portion, mechanism for simulating natural sucking motions comprising, in combination, a geared electric motor means mounted within said chest adjacent said neck and having a generally vertically oriented output shaft rotatable by said motor means at a low angular velocity; a crank formed by the upper end of said output shaft within said head for rotation of said upper end in a plane perpendicular to the principal axis of the doll and substantially at the level of said mouth opening portion; connecting means secured at one end to said mouth opening portion and pivotally connected at the opposite end to said crank for reciprocation by said crank responsive to rotation of said output shaft; whereby, upon energization of said motor means, said mouth opening portion and the adjacent portions of said face part are reciprocally deformed to simulate natural sucking and said head and chest are subjected to relative movement; said connecting means including a rigid component firmly coupled to said mouth opening portion; guiding means on said component operable to house and guide a stem-shaped control device, simulating the end of a baby's feeding bottle or the like, insertable into said mouth opening portion; means for controlling energization of said motor means, said controlling means including a first pair of normally disengaged spring contacts, mounted on said connecting means in a position wherein at least one said contact is encountered by a stem-shaped control device inserted into said mouth opening portion and brought into engagement with the other, said pair of contacts being disengaged responsive to withdrawal of the stem-shaped element from said mouth opening portion; electrically energized sound reproducing means mounted in said hollow chest; and means for controlling energization of said sound reproducing means including a second pair of contacts mounted on said connecting means and normally engaged, said second pair of contacts including one contact of said first pair; said second pair of contacts being positioned to be encountered by the stem-shaped control device upon insertion thereof into said mouth opening portion to disengage the contacts

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of said second pair from each other, said contacts of said second pair being reengaged responsive to withdrawal of the stem-shaped element from said mouth opening portion.

2. In a doll, mechanism as claimed in claim 1, including an inner stiffening element within said hollow head in engagement with the remainder of said hollow head exclusive of said face part to prevent said remainder from deformation upon energization of said motor means.

3. In a doll, mechanism according to claim 2, in which said stiffening element comprises a soft and light padding.

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4. In a doll, mechanism according to claim 1, in which that one of said first pair of contacts not included in said second pair of contacts has a bent end extending inwardly beyond the other contact of said first pair of contacts; whereby, upon insertion of a further stem-shaped element having a length in excess of that of the first-mentioned stem-shaped element into said mouth opening portion, said second pair of contacts are disengaged and said bent end is engaged by the further stem-shaped element to prevent engagement of said first pair of contacts.

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