MECHANICALLY ACTUATED DOLL WITH ARTICULATED LEGS

Fig. 1

Fig. 3
This invention relates to a mechanically actuated doll, and particularly to a doll so mechanized that it can move from one position to another without being touched.

It is an object of the invention to provide a doll which can be placed in a specially prepared crib or basket, lying down, and which, when the mechanism is set to operate, will lie still for a noticeable period of time (at least a few seconds) and will then sit up.

Another object is to provide a doll which will emit a crying sound while sitting up, as just stated.

It is also an object to provide a doll having the capabilities just mentioned, in which the sitting up and crying mechanism can be rendered optionally inoperative.

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

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

FIG. 1 represents a side elevation of the doll in sitting position, parts of the body and head being broken away and shown in section, to expose the mechanism;

FIG. 2 represents a similar view of the doll in lying down position;

FIG. 3 represents a detail perspective view of elements serving to fix the mechanism in the neck opening of the doll body;

FIG. 4 represents a vertical section taken on the line IV—IV of FIG. 1, looking in the direction of the arrows; FIG. 5 represents a detail section on the line V—V of FIG. 4;

FIG. 6 represents a detail section on the line VI—VI of FIG. 4, looking in the direction of the arrows, and FIG. 7 represents a detail section on the line VII—VII of FIG. 4 (the same as line VI—VI) looking in the opposite direction, as indicated by the reversed arrows.

Referencing to the drawings, the doll is shown as being of molded plastic material (e.g., vinyl) at least the body 1 being relatively rigid and the head 2, arms 3 and legs 4 and 5 being articulated thereto for movement in a normal manner. The arms and legs are each molded in one piece, but the arms may be jointed at the elbow if desired. At the upper end of the leg 4 there is provided an inwardly projecting plug 6 bearing an annular rim 7 which defines a groove 8 adapted to be engaged by the annular edge 9 of the leg opening, the leg being installed by forcing the rim 6 through the leg opening. Matching depressions and projections may be formed, for instance, in the rim 6 and adjacent surface of the edge 8, as indicated at 9, to hold the leg releasably in one or more adjusted positions (e.g., standing or sitting). At the upper end of the leg 4' there is provided an inwardly projecting plug 6' fixed to the leg and rotatable with respect to an annular plug 10 which is formed with a rim 11 and groove 12 engaged by the edge 8' of the leg opening. The plug 6' is held resiliently against the plug 10 by means of a strong rubber band 13 extending through axial bores in said plugs, and the contacting surfaces of said plugs 6' and 10 are formed with matching lugs 14 and depressions 15, 16 to hold the leg releasably in one or more adjusted positions, in a manner well known in this art. More specifically the depressions 15, located at diametrically opposite points in the surface of the plug 10, have substantially straight sides so that the lugs 14 will not easily ride out of them, while the depressions 16 (spaced 90° from the depressions 15) have steep but sloping walls, as indicated in FIG. 6.

The rubber band 13 is looped around a bridge plate 17 which extends across the bore of the plug 10 and is set into the inner face thereof, the outer ends of the rubber band being engaged by a smaller strip 18 which is fixed in position across the outer end of the bore of the plug 5'.

The mechanism in the body includes a flat strip 19 having its lower end anchored in the lower part of the body adjacent the back, as indicated at 20, and extending through the neck opening into the head, the strip being welded or riveted to a neck ring 21 which is fixed within the neck opening and being additionally braced, if desired, by a short horizontal cross-bar 22 the ends of which are affixed to the inside of the body. Another strip 23 of approximately the same length as strip 19 is loosely connected to the latter as by a rivet 24, the upper end of strip 23 (above the rivet) being bent forward to space it from the upper end of strip 19, and a small spring 25 between said bent end and the head of a pin 26 urges the upper ends of strips 19 and 23 toward each other and the lower portions, conversely, away from each other. A straight sided U-shaped guide 27' is shown as being mounted on the strip 19 just above the neck ring 21 in order to assist in keeping the strips 19 and 23 properly aligned. A conventional sound box or squawker 27 is mounted between the strips 19 and 23 about midway of their lower portions and arranged to emit a crying sound when compressed. Part of the strip 23 may be offset, as indicated at 23', to form a seat for one end of the squawker 27 and to permit proper expansion and compression of same.

The other part of the mechanism in the doll body comprises a transverse axle 29 (which may be in the form of a flat strip) having one end 29' non-rotatably fitted in a slot in the plate 17 and the other end 29" freely journaled in the plug 5 of the other leg, which may have a sleeve or lining 30 as indicated in FIG. 5. The ogee curved metal strip 31 has one end fixed to the center of the axle 29 and bears, near its other end, a rubber suction cup 32, so positioned that it presses firmly against a flat area 33 on the inside of the doll body when the axis of the body is aligned with the axis of the leg (i.e., in a flat lying position, FIG. 2). The lower end of the strip 31 is connected to the strip 19 by an elastic or spring 34 under rather strong tension. The lower end of the strip 23 is so located as to rest against the back of the strip 31, being held there by the constant action of the spring 25, as explained above. A very small (e.g., capillary) air bleed passage (not shown) may be provided in the body wall, extending outward from the flat area 33, in order to ensure delayed releasing of the suction cup from said area in case leakage around the rim of the cup does not suffice.

For this mechanism to operate as intended, it is necessary to hold down, in flat position, the leg 4" in which the end 29' of the axle 29 is fitted. The leg could, if desired, be weighted in some manner, but it is also provided that the doll should be placed on a specially prepared surface (as in a carrying basket) having a piece of "fish hook pile" material 35, of the type shown in the Des Moines Patent No. 2,717,427, glued thereto in a position to be engaged by a small patch 36 of the same material on the doll's heel. Similar results could be obtained by the provision of a small magnet and a piece of metal.

In operation, the doll is placed in a flat lying position (FIG. 3) with the operating leg held down. In this position the suction cup 32 is pressed against the area 33 causing it to take hold of the body wall. The doll remains lying down until the suction in the cup is
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relieved, as by leakage around the edges. When the suction cup releases the body, the elastic or spring 34
pulls the body up to a sitting position (full lines in FIG. 1, broken lines in FIG. 2), the strip 23 is forced by
the strip 31 to fold back toward the strip 19, thus compressing the squawker, and the doll cries out as it sud-
ddenly sits up. It is intended that the doll should lie still, before sitting up, at least a few seconds; the delay
varies somewhat depending on such factors as how hard the suction cup is pressed against the body area, ambient
humidity, the position of the arms, etc.

Since the legs can be adjusted to sitting or standing positions independently and without using the suction
cup mechanism (as by engaging the lugs 14 in the depressions 16 instead of in depressions 15) the doll can be
enjoyed in a normal manner and can be put to bed in the straight-out position when it is supposed to lie
still. If the doll is held erect while the suction cup is set and released, the moving leg will give a vigorous
kick to a ball or any other object in front of it.

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

What we claim is:

1. A doll comprising a body and legs articulated there-
to, delayed release mechanism between the body and one
of said legs, means for setting said mechanism to hold the
body and said leg temporarily in a fixed relative position
and said mechanism being automatically self-releasing
after at least a short delay, said delayed release mechani-
ism including a suction cup and a surface to which said
cup can temporarily adhere, said cup and surface being
so mounted that they may be brought into engagement
by relative movement of the leg and body in one direc-
tion, and said mechanism including means for causing
relative movement of the leg and body through approxi-
mately 90° upon the release of said cup from said sur-
face, said one leg being engaged to the body through
means providing two alternative positions of engage-
ment, in one of which the leg is firmly engaged with the
delayed release mechanism and in the other of which
the leg is adjustable normally without actuation of said
mechanism.

2. A doll according to claim 1 which includes a sound
producing device having a bellows, and a movable ele-
ment separate from the delayed release mechanism ar-
ranged to actuate the bellows to produce a sound upon
the release of said mechanism.

3. A doll according to claim 2 in which the movable
element is a lever and in which one end of the bellows
is attached to said lever.

4. A doll according to claim 3 which includes a spring
means biasing said lever in a direction to expand the
bellows.

5. A doll according to claim 3 in which the delayed
release mechanism includes a part fixed to a leg in a
position to bear against the lever for actuating the bel-
lows upon relative movement of the leg and body.

6. A doll according to claim 5 in which said suction
cup is mounted on said part fixed to a leg, and elastic
means biases said part in a direction to pull said cup
away from said surface.

7. A doll according to claim 6 in which the elastic
means is strong enough to cause the said part to com-
press the bellows.

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