

July 20, 1965

A. E. NEUMANN ETAL

3,195,268

DOLL WITH CHANGEABLE EXPRESSION

Filed March 1, 1963

3 Sheets-Sheet 1

Fig. 1

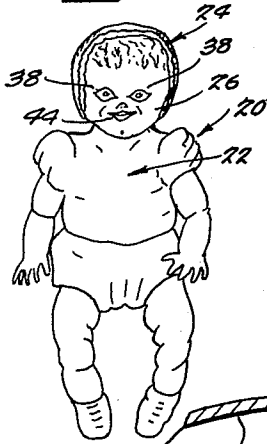


Fig. 2

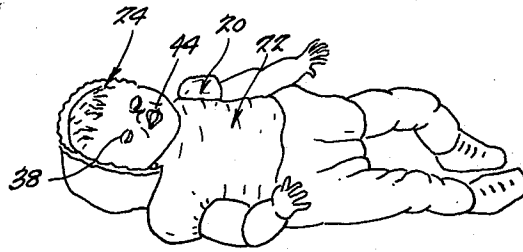


Fig. 2

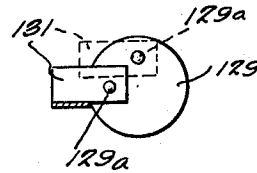


Fig. 3

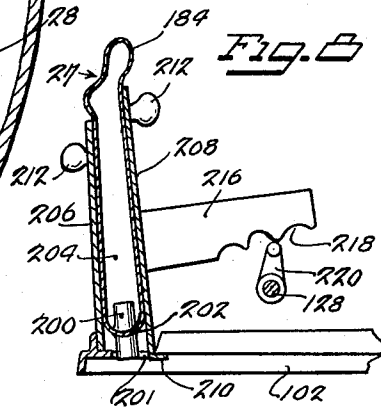
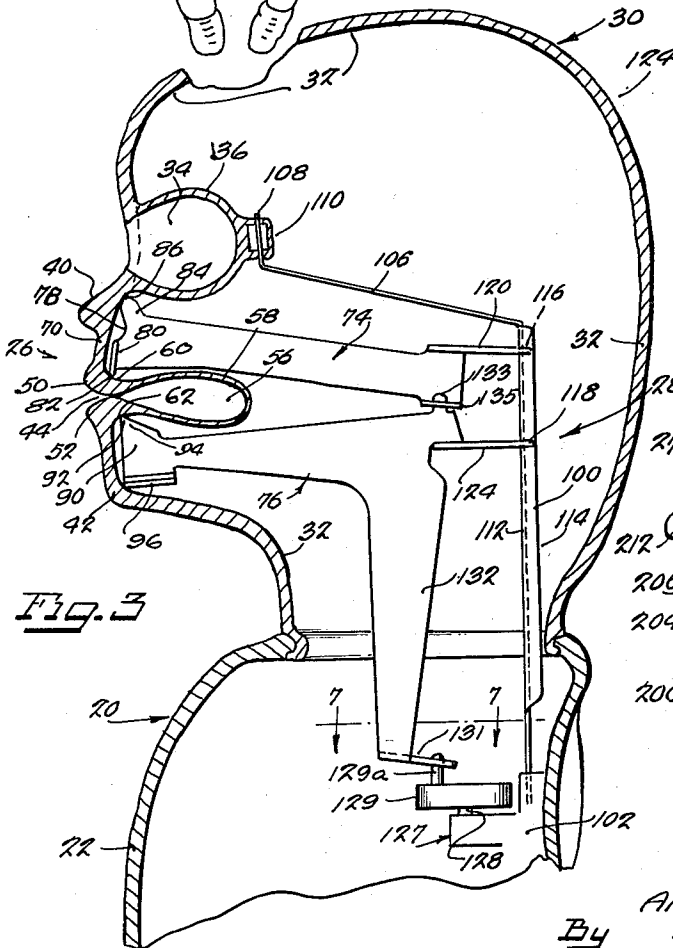


Fig. 3



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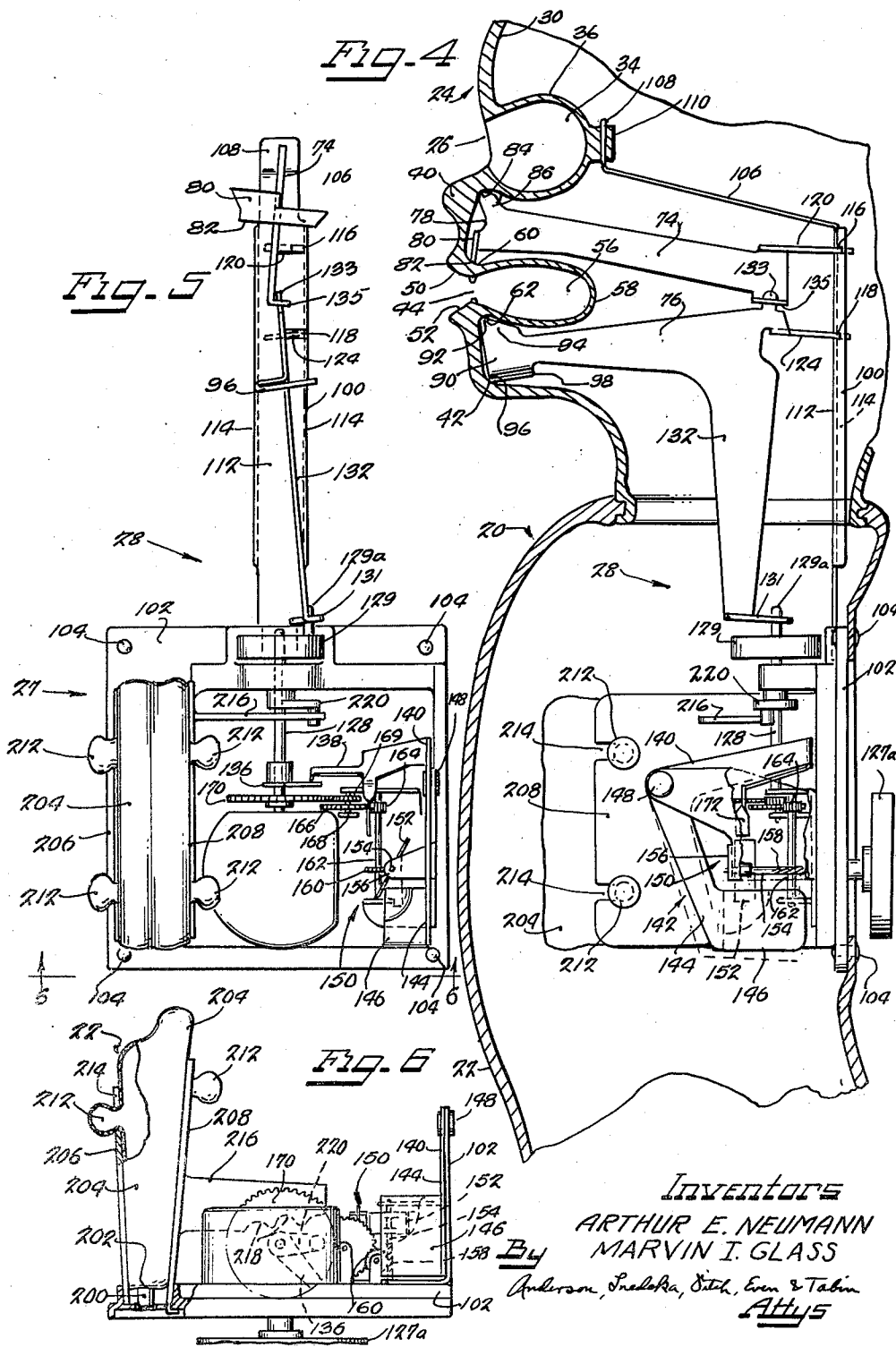
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3 Sheets-Sheet 2



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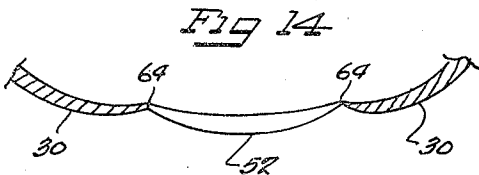
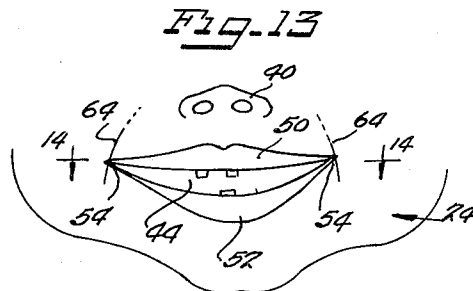
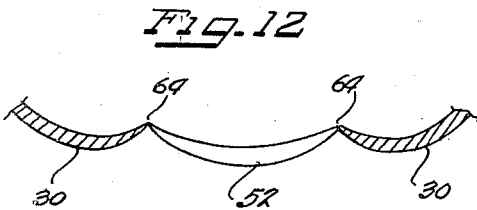
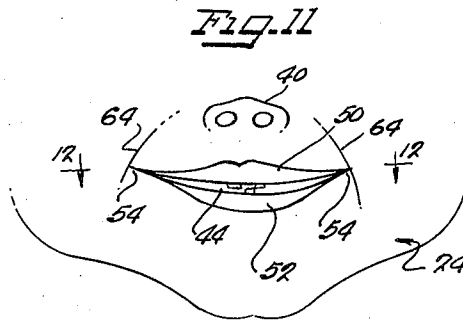
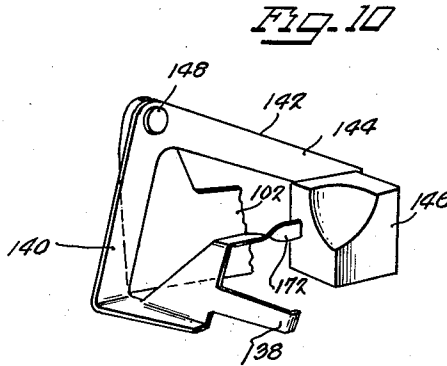
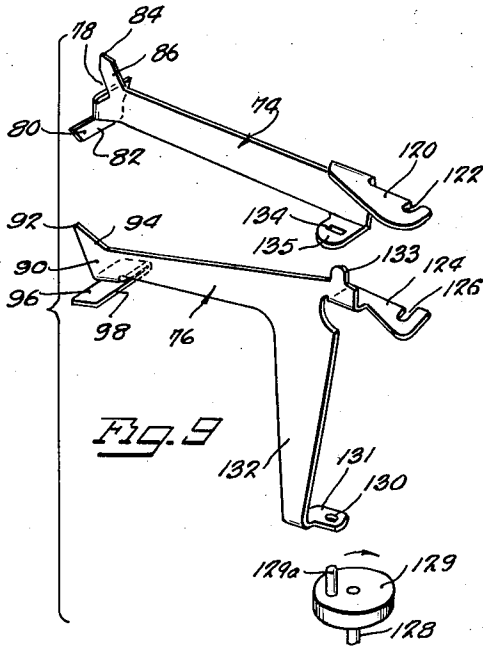
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DOLL WITH CHANGEABLE EXPRESSION

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3 Sheets-Sheet 3



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1

3,195,268

DOLL WITH CHANGEABLE EXPRESSION

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4 Claims. (Cl. 46—135)

The present invention relates generally to a doll and, more particularly, to a doll closely simulating a crying infant, and to features thereof.

The popularity of dolls as play things for children, particularly girls, seems to be never ending, in part because doll manufacturers constantly strive to produce more realistic dolls usually having the appearance of an infant. All sorts of expedients are well known in the doll art for simulating a crying baby. However, most dolls which have proven to be commercially feasible have merely incorporated features such as a mouth that moves, or eyes that open and close, or a crying noisemaker, these features sometimes being operable in unison. Realistic approximation of a crying infant, and particularly suitable articulation of the face has generally not been found to be practical in commercial dolls, in part at least because prior expedients entail too great a production cost. Similarly, noisemakers as provided in commercially practical dolls have generally been devoid of adequate realism in simulating the cry of an infant. Furthermore, in order to provide a doll which will retain a child's interest, the child should be able to control the actions of the doll.

It is, therefore, the primary objective of this invention to provide a new and amusing doll.

Another object is to provide a new and amusing doll realistically simulating an infant crying. A related object is provision of such a doll in which the crying action may be controlled by a child handling the doll.

A more specific object is to provide a new and amusing doll operable by a child handling the doll in a manner similar to typical handling of an infant and wherein the doll displays a happy, smiling expression in one position and in another position is operable for causing the facial expression to vary in the manner of a crying infant and to emit a sound closely simulating the cry of an infant. A related object is provision of new and useful structure for operating such a doll.

A further object is provision of a new and amusing crying doll having a mouth which moves in a manner similar to an infant crying. Another object is to provide a new and amusing doll having a face which realistically changes expression in the manner of a crying infant. Another related object is provision in such a doll for selectively controlling operation of the face in a realistic manner similar to normal handling of an infant. A further related object is provision of novel means for manipulating the face to change its expression.

A more specific object is provision of a new and amusing doll having a flexible face including a movable mouth formed in such a manner as to be operable for simulating facial movement of a crying infant and normally inoperative with the face displaying a happy, smiling expression.

A still further object is provision of a new and amusing doll which produces a sound realistically similar to an

2

infant crying. A related object is provision of a new and useful noisemaker for producing such a sound.

A more specific object is provision of a new and amusing doll which cries when placed in a reclining position, and closely simulates a crying infant by emitting a fluctuating crying sound realistically similar to that of a crying infant. A related object is provision of new and useful mechanism for producing such a sound.

These and other objects are more particularly set forth in the following detailed description and the accompanying drawings of which:

FIGURE 1 is a front, perspective, view of a preferred embodiment of the invention showing a doll in an upright position;

FIGURE 2 is a top perspective view of the doll in a reclining position and having changed its facial expression;

FIGURE 3 is an enlarged, fragmentary, vertical left side view of an upper torso portion of the doll in the upright position of FIGURE 1, with parts broken away and removed for clearer illustration;

FIGURE 4 is a fragmentary, left side view similar to FIGURE 3 but with the doll having changed its expression and action;

FIGURE 5 is a front view of apparatus shown in FIGURE 4 but removed from the doll body;

FIGURE 6 is a view taken along the line 6—6 in FIGURE 5, with a bellows apparatus in expanded position, and with parts broken away and removed for clearer illustration;

FIGURE 7 (sheet 1) is a fragmentary, sectional view taken generally along the line 7—7 in FIGURE 3;

FIGURE 8 (sheet 1) is a fragmentary, bottom view, similar to FIGURE 6, but showing the bellows apparatus in compressed position, with parts broken away for clearer illustration;

FIGURE 9 (sheet 3) is an exploded, left side perspective view of a portion of the apparatus shown in FIGURES 3—5;

FIGURE 10 is a perspective view of another portion of the apparatus shown in FIGURES 4—6;

FIGURE 11 is a fragmentary, enlarged, front facial view of the doll head in the position illustrated in FIGURE 1;

FIGURE 12 is a sectional view taken generally along the line 12—12 in FIGURE 11;

FIGURE 13 is a fragmentary, enlarged, front facial view of the doll head in the position illustrated in FIGURE 2; and

FIGURE 14 is a sectional view taken generally along the line 14—14 in FIGURE 13.

The illustrated embodiment of the invention is, in brief, directed to a doll, and more particularly to a crying doll, having a face which changes expression and emits an appropriate sound upon operation of actuating mechanism within a body portion of the doll. The face includes a mouth and related facial features which move in a manner realistically similar to that of a crying infant and which are operative to assume a smiling pose. In the preferred embodiment, the doll emits a realistic fluctuating crying sound upon operation of the actuating mechanism. The actuating mechanism is operable, in the preferred embodiment, for manipulating the face and operating the

noisemaker when the doll is in a reclining position and to provide a smiling appearance when the doll is in an erect position.

Basically, the crying doll has a body 20 closely approximating that of an infant and including a hollow torso 22 connected with a hollow head 24. The head 24 has a face portion 26 including a mouth portion movable in a manner closely approximating the facial expression of a crying infant and in a normal inoperative position the face displays a happy, smiling expression. Noisemaker means is provided for emitting a sound realistically similar to that of a crying infant, and as may best be seen in FIGURES 4-6 and 8, this means is in the form of a noisemaker assembly 27. Gravity actuated means for operating the previously mentioned components is provided by an actuating mechanism 28.

More particularly, the doll body 20 may be of any suitable material and in order to realistically simulate an infant's skin, a flexible resilient plastic material such as "Plastisol", well known in the trade, is preferable. The body 20 includes the hollow torso 22 in which is mounted the noisemaker 27 and the actuating mechanism 28, and to which the hollow head 24 is suitably attached with the hollows communicating through a neck portion of the body. In the illustrated embodiment the head 24 is defined by a wall 30 which may be generally of uniform thickness, particularly apart from the face, as indicated by the portions 32 (FIGURE 3) so that these portions of the wall are relatively rigid. Suitable eye sockets 34 are defined by relatively thin portions 36 of the wall and receive any desired type of eye devices 38. As illustrated, these eyes are automatically operable between a closed position when the doll is reclining, as shown in FIGURE 2, and an open position when the doll is in the erect position of FIGURE 1.

The face portion 26 also includes a relatively rigid nose 40 and a chin portion 42 with a mouth 44 therebetween, which along with the eyes 38 are disposed in normal facial arrangement. As shown in FIGURES 1, 3 and 11, the face displays a happy, smiling expression, and is movable in a crying manner between the closed position and an open position as shown in FIGURES 2, 4 and 13 with the mouth displaying a crying expression. The illustrated embodiment of the head is molded of resilient material, and is shaped and arranged so that the mouth 44 is normally in a generally open position, and when moved from this position the mouth is resiliently urged back to this open position.

The mouth 44 is defined by an upper lip 50 and a lower lip 52 extending across the face in normal arrangement and having opposite adjacent ends 54 shaped to define a sharp corner. A mouth cavity 56 is defined by a relatively thin cavity wall portion 58 which is formed integrally with the head and extends inwardly from the lips from inner portions thereof providing an upper abutment 60 and a lower abutment 62. These abutments cooperate with portions of the actuating mechanism 28 during crying operation for movement of the face between open and closed positions.

With particular reference to FIGURES 11-14, the facial portion of the head wall 30 is provided with relatively thin portions 64 extending upwardly from below the ends 54 of the lips and converging upwardly toward the nose 40. When the mouth portion is in a substantially closed position as shown in FIGURES 1, 11 and 12, these thin portions 64 define relatively long, deep, furrows of such configuration as to cooperate in defining the happy, smiling expression of the face. As the mouth portion moves toward the open position, as shown in FIGURES 2, 13 and 14, these thin portions 64 vary in configuration to cooperate in providing the carrying expression, and when the mouth is in open position these thin portions define relatively short shallow, furrows as seen in FIGURE 13. A relatively thin portion 70 (FIGURE 3) of the wall 30 between the nose 40 and the upper lip 50 facilitates

flexing of the mouth portion 26 and, if desired, may be formed to provide very slight wrinkling as the mouth moves to open position.

The actuating means in the form of the actuating mechanism 28 is provided for cyclically moving the lips 50 and 52 toward and away from each other and back and forth from side to side during opening and closing movement of the mouth, and further causing the upper lip 50 to move forward very slightly upon movement to open position, all in a manner closely simulating facial movement of crying infant.

The actuating mechanism 28 includes an upper first arm 74 above a lower second arm 76, and these arms are generally opposed to each other as may best be seen in FIGURES 3-5 and 9. The upper arm 74 has a front end 78 with a depending flange or tang 80 providing an elongated first abutment edge 82 generally parallel to the upper lip 50 and seated against the upper face abutment 60 defined by the inner surface of the cavity wall 58 adjacent the upper lip 50. A second abutment portion 84 is illustrated in the form of a point on a tang 86 extending upwardly from the upper arm front end 78 and slidably engaging the inner surface of the wall 30 along the nose 40. As will be more fully described hereinafter, the front end 78 of the upper arm moves up and down during movement of the mouth 44 between open and closed position, respectively, and during such movement the upper abutment 84 is free to slide on the inner surface of the head so that the thin portion 70 of the wall between the nose 40 and upper lip 50 may flex slightly to give a more natural appearance to the face. As mentioned previously, the face may be molded so that slight wrinkles will form in the thin wall portion 70 during such movement and more particularly as the mouth moves to open position.

The lower arm 76 also has a front end 90 with an upwardly extending first abutment 92 in the form of an upper point on a tang 94 extending upwardly from the lower arm 76, and this abutment is seated against the lower face abutment 62 defined by the inner surface of the mouth cavity wall 58 adjacent the lower lip 52. A lower second abutment 96 extending transversely from the lower arm 76 is generally parallel to the lower lip 52 and is seated against the inner surface of the wall 30 adjacent a pointed forward and lower portion of the chin 42.

Means is provided mounting the upper and lower arms 74 and 76, respectively, for a cooperative movement of their front ends across each other from side to side of the face and toward and away from each other, with the lower first abutment 82 of the upper arm 74 moving slightly forwardly as the front ends 78 and 90 move apart. More particularly, the abutment 82 moves forwardly so as to move the upper lip slightly forwardly from its closed position, as may best be seen in FIGURE 4. Herein this mounting means includes a base in the form of a column 100 extending longitudinally from within the torso 22 to within the head 24 and having a lower end fitted into a groove formed on a mounting plate or frame 102 suitably firmly attached to the back of the torso as by rivets 104. An upper end of the column 100 has a transverse arm 106 extending forwardly with an upstanding finger 108 firmly mounted on a rear portion of the eye socket wall 36 and more particularly secured in a boss 110 extending rearwardly from the eye socket wall, so that the column 100 is firmly mounted within the doll body 20. The portion of the column 100 extending upwardly within the head 26 is in the form of a rearwardly opening channel having a bight 112 and opposed rearwardly extending legs 114. This channel portion is provided with a vertically spaced groove in one of the legs 114 and a portion of the bight 112. These grooves include an upper groove 116 and a lower groove 118. The upper groove 116 receives a rearwardly extending finger 120 on the upper arm 74 with a notch 122 embracing the bight 112, as may best be seen in FIGURES 5 and 9. The lower groove 118 receives a

5

rearwardly extending finger 124 on the lower arm 76, and this finger has a notch 126 receiving the bight 112. Thus, the rear ends of the arms are retained properly located on the column 100 and are free to move in a twisting manner from side to side and up and down as they pivot about the column 100.

Actuating means is provided for moving the arms 74 and 76 to provide the cooperative movement between the respective front ends 78 and 90 of the arms as previously described. With particular reference to FIGURES 4-6, the actuating mechanism 28 is illustrated in the form of a manually wound spring type motor 127 mounted on the frame 102 and having a knurled winding disk 127a extending rearwardly from the doll body 20. A rotating drive shaft 128 of the motor extends toward the doll head 24.

The motor drive shaft 128 carries a wheel 129 having an eccentric drive pin 129a extending toward the head 24 with a free end of this pin received in an aperture 130 (FIGURE 7) in a flange 131 extending transversely from a free end of a drive arm 132 integral with and depending from the lower arm 76. Responsive to rotation of the motor drive shaft 128, the drive pin 129a is rotated in a circular path (FIGURE 7), thus moving the flange 131 in a circular path, providing up and down as well as side to side components of motion to the lower arm 76 as it moves about its pivotal mounting on the column 100. Such movement causes a free end 90 of a lower arm 76 to move longitudinally as well as side to side of the doll head. A similar up and down and side to side movement is imparted to upper arm 74 and its front end 78 by means of a connection between the upper and lower arms, which connection includes an upwardly extending flat tab 133 received in a complementary slot 134 in a finger 135 extending vertically from the rear end of the upper arm 74. Thus, the upper and lower arms 74 and 76, respectively, are mounted at their rear ends and are cooperatively driven in unison to provide the desired facial movement of the doll head 24.

Gravity actuated control means is provided for normally holding the motor 127 against operation, when the doll is in erect position, and for releasing the motor for operation when the doll body 20 is in other than erect position, as when it is in the reclining position shown in FIGURES 2 and 4. In the illustrated embodiment, this control means is in the form of stop means including a finger 136 fixedly secured to and extending radially from the drive shaft 128 and normally engaged by a cooperating stop finger 138 integral with one arm 140 of a bell lever 142. The bell lever has a second arm 144 with a free end mounting a weight 146 and is pivoted at the junction of these arms to the frame 102 by means of a pivot pin 143. When the doll body 20 is in an upright position, as shown in FIGURE 1, the weight 146 causes the lever 142 to pivot around the pin 143 to a stop position, as illustrated by dotted lines in FIGURE 4. The stop lever finger 138 is moved into abutting relationship with the drive shaft finger 136, which finger 136 lifts finger 138 and its extending tab 172 in engagement with the air governor blade 152, thereby preventing its rotation and the rotation of all of the following trains of shafts including shaft 128.

More particularly, the means for controlling the speed of rotation of the drive shaft 128 is provided in the illustrated embodiment by a governor 150 having a rotor in the form of a paddle wheel 152 fixed to a shaft 154 journaled in a pair of flanges 156 fixedly associated with the frame 102. Gear means is provided for rotating the paddle in ambient air and at relatively high speed responsive to relatively slow speed of the drive shaft 128. Herein the paddle wheel shaft 154 includes a worm 158 drivingly meshed with a gear 160 on an intermediate shaft 162 which carries a pinion 164 driven by a large gear 166 of a gear cluster on another intermediate shaft 168, this cluster having a pinion 169 driven by a large gear

6

170 on the motor drive shaft 128. This gear train provides an overall gear ratio for rotating the paddle 152 at a speed much higher than that of the motor drive shaft 128 and sufficiently high so that as the paddle wheel rotates in the air it smooths out in rotation and limits the speed of the motor drive shaft. As the gravity control means moves to stop position, another finger 172 integral with the bell lever arm 140 moves into the path of rotation of the paddle wheel 152 to stop the paddle wheel. The stop finger 136 always stops the drive shaft 128 in the same position and the mouth actuating linkage is adjusted so that the mouth is closed in a smiling position.

Means for emitting a sound realistically similar to that of a crying infant is provided by the noisemaker assembly 27, as may best be seen in FIGURES 4-6 and 8. In the preferred embodiment the noisemaker assembly is an air operated device which emits a fluctuating sound through a two-way whistle or reed 200. This whistle produces a tone closely similar to the cry of an infant. The whistle extends through an opening 201 in the frame 102 and is mounted in a return portion 202 of a bellows type air pump 204. The bellows is mounted between a pair of rigid plates including a stationary plate 206 firmly secured to the frame 102 and a movable plate 208 extending through the opening 201 and having a transverse flange 210 engaged about an edge portion of this opening thus mounting the movable plate for pivotal movement toward and away from the stationary plate 206. The bellows 204 has opposite sides each firmly secured to the adjacent plate as by protuberances 212 held in slots 214 in the adjacent plate. Thus, as the pivoted plate 208 moves toward the stationary plate 206 the bellows is compressed and exhausted of air, forcing the air outward through the whistle 200, and as the pivoted plate moves away from the stationary plate 206 the bellows is expanded drawing air inwardly through the whistle 200.

Means is provided for cyclically operating the bellows 204 between exhausted and expanded positions, so that movement of the bellows between these positions is varied and causes the sound emitted by the whistle 200 to fluctuate in tone and periods of duration in a manner simulating the fluctuating cry of a baby. In the illustrated embodiment, this means includes a cam mechanism having a cam arm 216 rigidly secured to and extending transversely from the pivoted plate 208. A lower edge of this arm is provided with serrations, as 218, of a varying configuration between high and lows thereof to vary the compression and expansion pattern of the bellows 204 responsive to operation of a cooperating cam actuator 220. The cam actuator is in the form of a finger firmly mounted on the motor drive shaft 128 and having a free end serially engaging the serrations 218 upon rotation of the drive shaft 128. Thus, the noisemaker assembly 27 is driven by the operating mechanism 28 and is operative only when the movable face 26 is in operation.

To summarize operation of the doll, when the doll is in erect position as shown in FIGURES 1 and 3, the mouth 44 is closed and the face displays a happy, smiling expression with the eyes 38 open. When the doll is placed in reclining position as shown in FIGURES 2 and 4, the actuating mechanism rotor 129 rotates and through its eccentric pin 129a connected with the drive arm 132 drives both the lower arm 76 and the upper arm 74 in such a manner that the front ends of these arms are moved toward and away from each other and across each other from side to side through a slightly twisting path so that the mouth moves in a crying manner. In addition, the thin portions 64 of the wall 30 change configuration as the mouth moves between open and closed positions to cooperate therewith in providing the changing facial expression. The actuating mechanism is provided with suitable gravity operated means including the weighted arm 142 which maintains the motor 127 inoperative when the doll is in erect position and permits operation of the motor when the doll is in reclining position.

Operation of the motor further operates the noisemaker 27 through rotation of the cam actuator 220 which engages the serrations 218 of the cam arm 216 to expand and contract the bellows 204 with varying abruptness and with varying frequency, causing air to flow into and out of the bellows through the two-way whistle 200, thereby closely simulating the cry of an infant.

When the doll is moved to the upright position, the gravity actuated lever 142 moves to the dotted line position shown in FIGURE 4 and stop finger 138 engages the finger 136 on the motor drive shaft 128 (the finger 172 moves into the path of rotation and the path of the governor paddle wheel 152 to stop the paddle wheel), thus stopping the drive shaft in position with the mouth closed and smiling as shown in FIGURE 1, and the crying stops.

The present invention provides a noisemaker, and an articulated doll face which closely simulates a crying baby. By properly forming the wall 30 and by proper coordination of the upper and lower operating arms 74 and 76, realistic facial movements of a crying infant may be provided. It should be noted that while the illustrated embodiment of the invention is directed to a crying doll, the invention is equally applicable to manipulating of faces which change expressions in different manners or to articulation of other structures.

While this invention has been described with reference to certain structure, material and operation in a particular environment, various changes may be apparent to one skilled in the art and the invention therefore is not to be limited to such structure, material, operation or environment. Various features of the invention are set forth in the following claims.

What is claimed is:

1. A doll comprising, a hollow head defined by a resilient wall face portion actuable for changing expression, said face portion including a nose, a chin, and a mouth between said nose and chin positioned in normal facial arrangement and operable in a crying manner between a relatively closed, smiling mouth position and relatively open mouth position, said mouth including upper and lower lips, relatively thin portions of said wall extending upwardly alongside the opposite ends of the lips, said thin portions being disposed in furrows variable in configuration responsive to movement of said face portion between said positions, and actuating means selectively operable for cyclically operating said face portion between said positions and moving said upper lip slightly forwardly as said mouth moves from said closed position toward said open position.

2. A doll comprising, a hollow head including a resilient wall face portion actuable for changing expression, said face portion including a nose, a chin, and a mouth between said nose and chin positioned in normal facial arrangement and operable in a crying manner between a relatively closed, smiling mouth position and relatively open mouth position, said mouth including upper and lower lips, relatively thin portions of said wall extending upwardly alongside the ends of said lips, and said thin portions being disposed in furrows variable in configuration in response to movement of said face portion between said positions, and actuating means selectively operable for cyclically operating said face portion between said positions and moving said upper lip slightly forwardly as said mouth moves from said closed position toward said open position, said actuating means including upper and lower generally opposed arms extending from front to rear within said head, the upper arm having a front end with a depending first abutment at said upper lip and seated against the wall adjacent said upper lip, and said front end of the upper arm further including an upwardly extending abutment seated against said wall along said nose, the lower arm having a front end with an upwardly extending abutment seated against said wall adjacent said lower lip, and said lower arm further having a depending

abutment seated against said wall along said chin, means mounting said arms for cooperative movement of said front ends toward and away from each other with said first abutment on the upper arm moving slightly forwardly as said front ends move apart, and drive means operable for moving said arms and providing said cooperative movement of said front ends.

3. A doll comprising a head including a resilient wall defining the face and including a mouth portion having a mouth operable in a crying manner between a relatively closed position with the face displaying a happy, smiling expression and relatively open position, said mouth including upper and lower lips formed integrally with a cavity-forming portion extending inwardly of the doll head, each of said lips having opposite ends adjacent opposite ends of the other lip and the adjacent opposite ends being connected to define sharp corners, a relatively thin portion of said wall spacing a nose above said upper lip and being effectively smooth when said mouth is in said closed position and being wrinkled when said mouth is in said open position, opposed narrow and relatively thin portions of said wall converging upwardly from below the lip ends toward said nose, one said thin portion being disposed along each of the lip opposite ends, and said thin portions being variable in configuration responsive to movement at said mouth and disposed in long, relatively deep furrows to in part define said happy, smiling expression when said mouth is in said closed position, and being disposed in short, relatively shallow furrows to in part define said crying expression when said mouth is in said open position, and actuating means selectively operable for cyclically operating said mouth between said open and closed positions and moving said upper lip slightly forwardly as said mouth moves from said position toward said open position, said actuating means including upper and lower generally opposed arms extending from front to rear within said head, the upper arm having a front end with a depending first abutment generally parallel to said upper lip and seated adjacent said upper lip, and said front end further including an upwardly extending pointed abutment seated against said wall along said nose, the lower arm having a front end with an upwardly extending abutment seated adjacent said lower lip and against the wall of said cavity forming portion and said lower arm further having a depending abutment generally parallel to said lower lip and seated against said wall along said chin, means mounting rear portions of said arms for cooperative movement of said front ends across each other from side to side of said face and toward and away from each other with said first abutment moving slightly forwardly as said front ends move apart, and drive means within said doll selectively operable for moving said upper and lower arms and providing said cooperative movement of said front ends thereof.

4. A doll comprising a body, a hollow head fixed to said body and defined by a resilient wall face portion actuable for changing expression, said face portion including a nose, a chin, and a mouth between said nose and chin positioned in normal facial arrangement and operable in a crying manner between a relatively closed, smiling mouth position and a relatively open mouth position, said mouth including upper and lower lips and actuating means supported on a frame within said body and selectively operable for cyclically operating said face portion between said positions, said actuating means including a first part seated against said wall adjacent said upper lip and a second part seated against said wall adjacent said lower lip, means mounting said parts for cooperative movement toward and away from each other in a manner such that said upper lip moves slightly forwardly as said mouth moves from said smiling position to said open position, a motor mounted on said frame and having a rotary drive shaft, and an eccentric drive means connecting said shaft with one of said movable parts so

that rotation of said shaft produces said movement of said parts toward and away from each other.

References Cited by the Examiner

UNITED STATES PATENTS

1,140,650	5/15	Aronson	46—186
1,769,584	7/30	Lauter	46—186
2,700,846	2/55	Coe	46—135 X
2,710,674	6/55	Duncan	185—37

5

2,803,089	8/57	Crompton	46—135
2,881,864	4/59	Rubenstein	185—37
3,021,641	2/62	Banks	46—135
3,103,762	9/63	Glass et al.	46—118 X
3,136,089	6/64	Gardel et al.	46—232

FOREIGN PATENTS

513,907	11/20	France.
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