June 1, 1965 R. K. OSTRANDER 3,186,126

DOLL HAVING AN IMPROVED MOUTH TOGETHER WITH SOUNDING MEANS AND LIP MOVING MECHANISM COOPERABLE THEREWITH

Filed March 8, 1963 2 Sheets-Sheet 1

Fig. 1

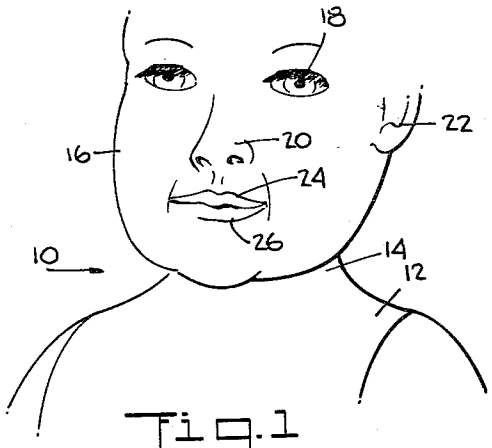


Fig. 2.

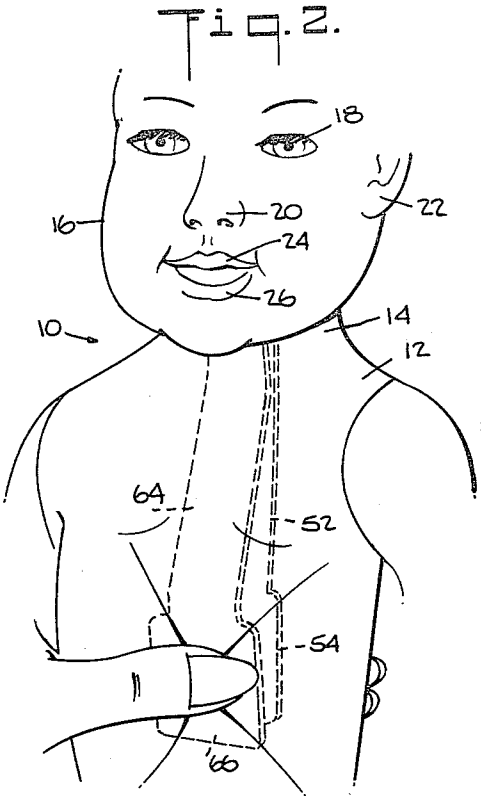


Fig. 3.

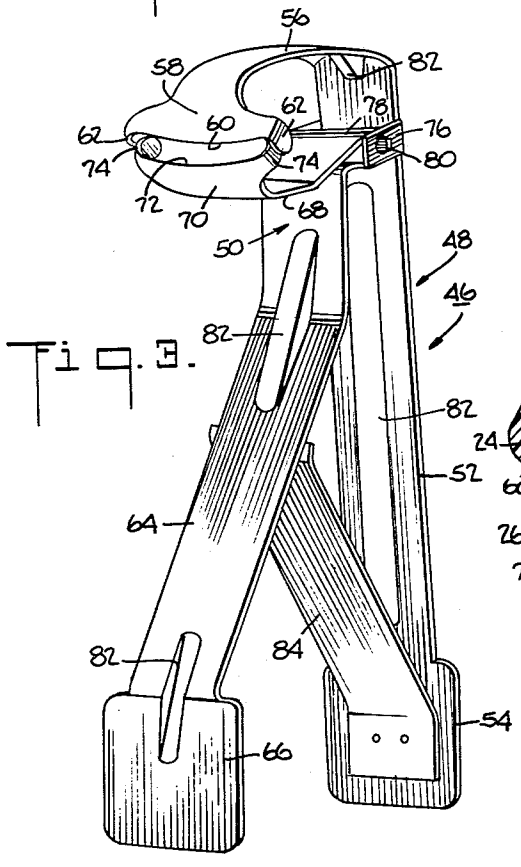
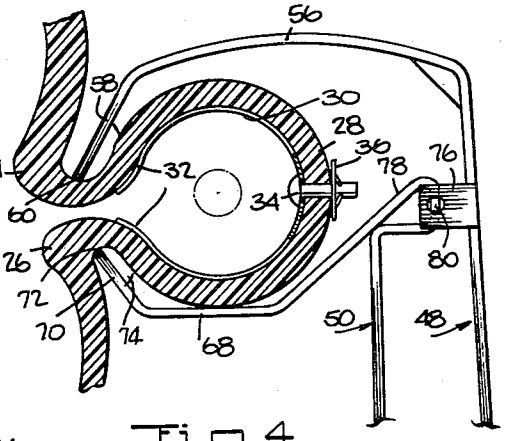


Fig. 4.



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Fig. 5.

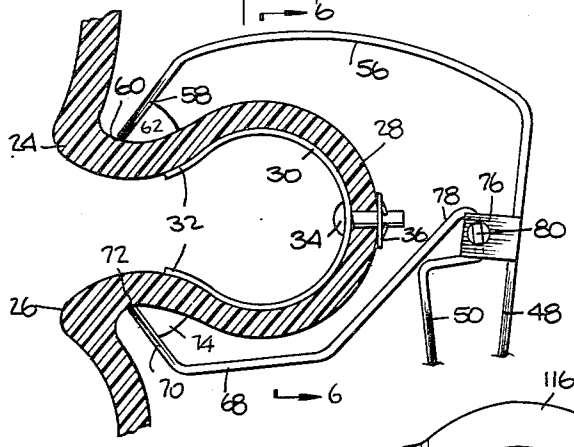
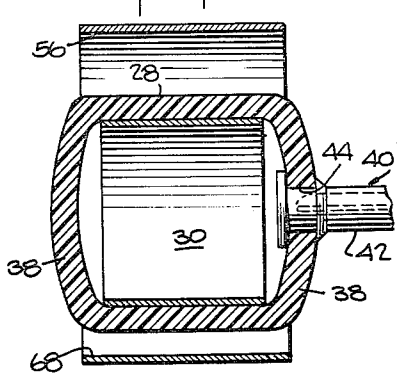
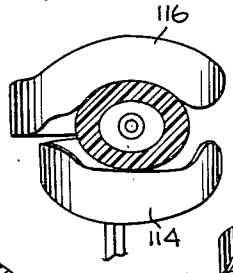


Fig. 6.





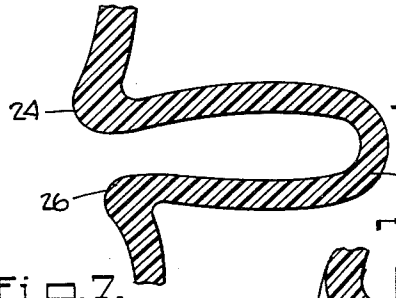


Fig. 11.

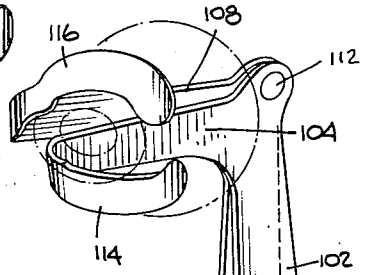


Fig. 7.

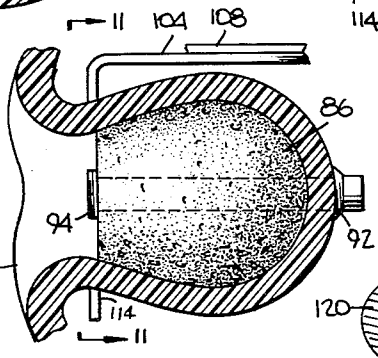


Fig. 10.

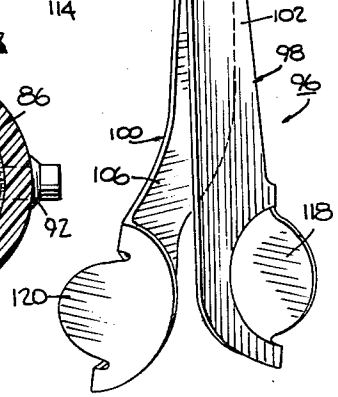


Fig. 9.

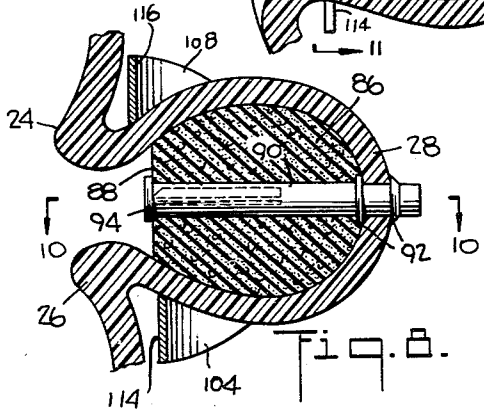


Fig. 8.

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DOLL HAVING AN IMPROVED MOUTH TOGETHER WITH SOUNDING MEANS AND LIP MOVING MECHANISM COOPERABLE THEREWITH

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Filed Mar. 8, 1963, Ser. No. 263,922
18 Claims. (Cl. 46—118)

This invention relates to dolls, and, more particularly, is concerned with a doll having an improved mouth. My invention further pertains to a doll of the character described which also preferably includes a sounding means or a lip moving mechanism, or both, that cooperate in a novel manner with the improved mouth.

It has been proposed heretofore to provide a doll in which the face was soft and included a deep natural appearing mouth cavity constituting a sac formed integrally with the face and joined to the face along the outlines of the lips. It further has been proposed to employ in conjunction with such a mouth cavity a lip actuator which constituted two bell crank levers pivotally interconnected within the head behind the sac and having their forward ends engaging the inside surface of the lips so that when the levers were manipulated (swung with respect to one another) they would open or close the lips. In this previously proposed construction, means was provided to hold the actuator with the forward ends of the bell crank levers against the inside surfaces of the lips. Such means constituted, for example, a wire or a tube running from the back wall of the mouth sac to the pivot interconnecting the bell crank levers. However such a holding means tended to distort the soft face, and particularly the lips, so as to give the face an unattractive appearance. Due to the arcuate movement of the levers the pivot shifted forwardly or rearwardly and through the holding means uncontrollably drew in or pushed out the lips when the lip actuator was motivated. This drawback has interfered with the marketing of dolls embodying the foregoing mouth and lip actuator construction.

It is an object of my invention to provide an improved arrangement in which the aforesaid drawback is obviated.

It is another object of my invention to provide a doll having a deeply recessed mouth cavity in combination with a lip actuator, wherein no means is employed to hold the actuator with the forward ends of the bell crank levers against the inside surface of the lips.

It is another object of my invention to provide a doll of the character described in which lip actuator means floats within the doll and, more specifically wherein the forward ends of the bell crank levers float within the head so that they are, in a sense, self-locating and require no mechanism to positively hold them in place.

In general I carry out the foregoing aspect of my invention by altering the shape of the mouth cavity. Heretofore said cavity has comprised a sac that was rearwardly elongated and tapered rearwardly from the lips the same constituting a well that was molded in one piece with the face and was joined thereto at the lips. As noted above the rear end of the sac previously was connected by a link to the lip actuator at the pivot between the bell crank levers and it was this link that distorted the lips. Pursuant to my invention the link is eliminated

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and, instead, the shape of the mouth sac is made firmly bulbous rather than rearwardly tapering. Phrased differently, the mouth sac now is in the shape of a peduncle, that is to say, the sac flares rearwardly from the lips instead of tapering rearwardly, i.e. the front of the sac is connected to the lips by a constricted zone. Specifically, the mouth sac flares rearwardly from the lips in at least a vertical plane so that the height between the roof and bottom of the sac is small immediately adjacent the lips and increases rearwardly to a region of maximum size after which the height reduces as the roof and bottom of the sac merge into the rear end thereof. Thus the mouth sac firmly bulges upwardly and downwardly in a direction rearwardly of the lips. Thereby the forward ends of the levers constituting the lip actuator and which are located immediately behind the inside surfaces of the lips tend to be cammed, i.e. guided, forwardly by the exterior wall of the mouth sac. However this tendency does not hold the lip actuator in place since the actuator being unconnected to the mouth sac is free to float in the head and, therefore, is self-locating. Moreover the maximum height of the bulging sac exceeds the distance the forward ends of the lip actuating levers can be spread apart so that although the actuator is floating it can not be accidentally shifted rearwardly to disengage the sac.

I have found that such a bulbous shape of mouth sac has advantages other than those deriving from its utilization in combination with a lever type of lip actuator. For example, when such a bulbous mouth sac is provided a child looking into the interior of the mouth cannot readily see either the roof or bottom surfaces of the mouth sac. This is due partly to the fact that both of these surfaces are out of the normal line of vision and further arises from the fact that because these surfaces are above and below the mouth opening they are out of the line of illumination of light present in a room or outdoors so that the surfaces, being unlit, are dark and not easily seen. Accordingly, in this respect the mouth of the doll resembles the dark appearance of a human oral cavity.

There is a further and very distinct advantage that arises from the use of such a bulbous mouth sac. When a sounding means is associated therewith I have discovered that this bulbous shape, despite, or possibly because of, the soft texture of the walls of the sac, imparts a resonant quality or timbre to any sound which passes therethrough.

It therefore is a further object of my invention to provide a doll of the character described having a bulbous mouth sac with which a sounding means is associated so that the sound emanating from said means is introduced into the sac and then permitted to issue from between the lips. It will be observed that such a sound has a pleasing, husky, deep pitched calibre which I believe may be due to the fact that the low pitched portions of sound issuing from the sounding means are selectively amplified by the sound chamber constituted by the mouth sac.

It is a more specific object of my invention to provide a doll of the character described in which there is associated with a bulbous mouth sac a simple inexpensive type of sounding means such, for instance, as an air actuated noisemaker. Such a sounding means creates a non-harmonious harsh mixture of tones and this mixture will be modified by the amplifying action of the bulbous sac which tends to enhance the low pitched tones and to

minimize or suppress high pitched tones so that instead of the usual raucous noise customarily associated with such a noisemaker a sound of rather pleasant mellow and almost voice-like quality will issue from the parted lips of the doll.

It should be observed at this point that the improvement in sound quality deriving from the use of a bulbous mouth sac is independent of the lip actuator. It therefore is within the scope of my invention to employ a sounding means in combination with a pedunculate type of mouth sac and without a lip actuator since the sounding means can be activated, for example by simply squeezing the torso of the doll, providing that the same is hollow, or the head of the doll if it is hollow. Sufficient air pressure thereby will be created by a bellows like action to energize an air actuated sounding means that is mounted on a wall of or has a passageway connected to the bulbous mouth sac.

In a preferred form of my invention both a sounding means and a lip actuator are used inasmuch as they provide a high degree of naturalness since the lips will move at the same time that a voice-like sound of pleasant quality issues from between the parted lips.

Where both a lip articulator and a sounding means are associated with a mouth sac still another advantage can be gained if the lips are properly positioned when the doll is in its unactuated (idle) state and this advantage is particularly noticeable where a bulbous mouth sac is employed to impart a voice-like quality to the sound produced. More particularly, if the lip actuator is so positioned that actuation thereof to open the lips creates an increase in internal torso air pressure which is used to activate the sounding means, initial operation of the lip actuator will build up a pressure within the doll so that upon opening of the lips a pulse of pressure flows through the sounding means and the first sound which is heard will resemble a stopped (explosive) labial consonant. This gives rise to a simulation of speech. Phrased differently, the first sound that will be heard will appear to resemble the first syllable of a word which starts with a stopped labial consonant. The particular stopped labial consonant that is heard will depend upon the relative position of the closed lips. Thereafter when the lip actuator is released and is biased back to its idle condition and if the sounding means will generate a sound upon the intake of air through the mouth and mouth cavity a second syllable will be created.

Also it is within the scope of my invention to connect to the bulbous sac a sounding mechanism which in itself will create articulations over and above the dual articulation brought into play by first squeezing and then releasing the lip actuator or a sounding mechanism which will create actual speech as by employment of a tape or phonograph.

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 elements and arrangements of parts which will be exemplified in the devices 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 various possible embodiments of my invention,

FIG. 1 is a front fragmentary perspective view of a doll's head and upper torso which include a mouth sac, a lip actuator and a sounding means constituted and correlated in accordance with my invention, the same being illustrated with the lip actuator idle and the lips closed;

FIG. 2 is a view similar to FIG. 1, but illustrating the torso and face as they appear after the lip actuator has been actuated to part the lips;

FIG. 3 is a perspective view of the lip actuator as it appears when removed from the doll;

FIG. 4 is a vertical front-to-back fragmentary enlarged sectional view of the doll's head, the same being taken through the center of the closed lips of FIG. 1;

FIG. 5 is a view similar to FIG. 4, but taken through the parted lips of FIG. 2;

FIG. 6 is a sectional view taken substantially along the line 6—6 of FIG. 5;

FIG. 7 is a vertical sectional view through the center of the lips of the doll with the mouth sac illustrated in its as-molded form before being altered to a vertically bulged shape;

FIG. 8 is a view similar to FIG. 5 of a doll embodying a modified form of my invention;

FIG. 9 is a perspective view of the lip actuator used in the doll of FIG. 8, the same being shown apart from the doll but with the mouth sac illustrated in phantom (dot-and-dash) lines;

FIG. 10 is a sectional view taken substantially along the line 10—10 of FIG. 8; and

FIG. 11 is a sectional view taken substantially along the line 11—11 of FIG. 10.

Referring now in detail to the drawings, and more particularly to FIGS. 1–7, the reference numeral **10** denotes a doll which is of conventional construction except for the bulging configuration of the mouth sac and except for the cooperation of the lip actuator and the sounding means with said sac.

Said doll includes a hollow torso **12** of standard design on the open-ended neck **14** of which a hollow head **16** is mounted. The torso is made of a flexible material, for example, natural or artificial rubber or polyvinyl chloride so that it can be partially collapsed by squeezing and may be fabricated in any customary manner, e.g. by slush or injection molding. The material is soft and resilient whereby it will tend to spring back to its as-molded shape after squeezing. This construction is preferable in the form of the invention being described since the body is intended to function as a hollow chamber having at least one resilient wall that can be squeezed for the purpose of operating the lip actuator as well as for the purpose of operating the sounding means. It will be appreciated that extreme flexibility is not needed for these purposes and it will suffice if the torso is readily yieldable to a child's finger pressure.

The torso is, of course, provided with the usual arms and legs which may be connected thereto in any suitable fashion.

The head **16** is molded from a soft flexible resilient material such, for instance, as polyvinyl chloride. I prefer to make the head by slush molding from a plastisol since not only does this permit me to secure a skin which is warm and realistic to the touch and closely simulative of a child's face, but it also enables me to obtain a dead soft quality for the skin of the doll's head, thus being a flexible resilient quality that enables the skin to be deformed with great ease upon the application of an external force but causes the skin to return to its original as-molded shape when such force is released. Such dead soft quality permits ready movement of the lips upon energization of the lip actuator and its use for this purpose is known to the art.

The head includes the usual features, to wit, eyes **18** in eye sockets, a nose **20** and ears **22** all of conventional configuration and construction. The head further includes a pair of lips constituting an upper lip **24** and a lower lip **26**. These lips are in the shape of human lips and therefore protrude slightly along the lip lines and are separate from one another except at the corners of the mouth. The lips preferably are molded in parted condition, as shown in FIG. 7, and, optionally, to provide a somewhat piquant expression the lower lip is so molded as to be displaced slightly to the rear of the upper lip as can be seen from inspection of this figure.

Molded in one piece with the head and with its forward edges joined integrally with the rear edges of the lips is a hollow mouth sac **28** which, accordingly, is likewise

of dead soft quality. Said sac extends rearwardly from the open forward end at the lips into the interior of the hollow head. The surface of the sac which faces the interior of the head will hereinafter be referred to as the exterior surface of the sac while the surface of the sac which faces and defines the mouth cavity will be referred to as the interior surface of the sac.

In accordance with a principal phase of my invention the mouth sac 28 is of a bulbous contour with the neck, i.e. reduced forward open end of the sac, adjacent and joined to the lips so that the bulbous profile in effect consists of walls that flare rearwardly from the inner surfaces of the lips. In the preferred form of my invention wherein the lip actuator is used, the rearward flaring takes place in a vertical direction, or, in other words, the roof and base of the mouth sac flare away from one another in a direction rearwardly of the lips until said roof and base of the sac converge to define a rear end for the sac.

In its as-molded shape the hollow sac 28 may or may not have the desired bulbous (upwardly and downwardly bulging) configuration. As shown in FIG. 7 said sac is essentially nonbulbous as molded in the sense that its vertical dimensions from its neck to its rear end are approximately the same, there being only a mild constriction adjacent the lips. The maximum enlargement illustrated in the as-molded condition of the sac is only about 50% greater than the minimum vertical dimension, that is to say the maximum vertical dimension of the sac about half-way between the front and rear thereof is only about 50% greater than the vertical distance between the top and the bottom of the sac at the lips. This is not sufficiently bulbous, nor is the sac sufficiently firm, to enable the lip actuator to automatically seat itself in proper position nor is it sufficiently boulbous to obtain the resonance for deepening the doll's voice. Therefore to procure the desirable bulbous configuration I place a bulging and firming insert within the sac 28.

In the form of my invention being described said insert constitutes a leaf spring 30, to wit, a strip of spring steel stock which in relaxed condition is roughly C-shaped in profile. Specifically, the leaf spring in its unstressed state has an approximately circular segment extending over about 270°, said segment terminating in forwardly extending reaches 32 that have outwardly concave surfaces facing the upper and lower interior surfaces of the sac 28 immediately rearwardly of the lips.

The spring 30 is weak enough to permit the reaches 32 to be quite easily flexed into contact with one another. However the spring is sufficiently strong to spread and firm the constricted neck of the sac when no other forces are applied to the sac, that is to say, when the lip actuator permits the lips to move apart.

The leaf spring 30 is inserted into the sac to engage the top and bottom walls and rear end thereof and to spread the sac into a firm bulbous shape as shown in FIG. 5. In this shape the maximum vertical dimension of the sac is approximately at least double the vertical dimension of the sac adjacent the lips; but what is of more importance there is a marked firm slope on the exterior surface of the sac adjacent the lips whereby to obtain a forward camming, i.e. guiding, action on the forward ends of the lip actuator so that the same will automatically float forwardly into a position in which the forward ends of the actuator are near the inside surfaces of the lips without exerting any rearward pulling force on the lips.

Since the sides of the leaf spring are open, the sides of the sac are not engaged thereby and the insertion of the leaf spring into the sac mildly stretches the side walls of the sac. It is believed that the consequent lateral semiflattening (increase in radius of curvature) of the side walls of the sac has a desirable effect on the tonal quality of the sound emanating from the sound maker.

Although the leaf spring will tend to remain in its centered position in the sac, as illustrated, with the tips of the reaches 32 behind the lips and thereby not readily visible to a child, it is preferred to include means for preventing the leaf spring from being deliberately displaced if a child, for example, should poke an implement into the doll's mouth. For this purpose I provide a rivet 34 the head of which is located within the mouth and the shank of which extends through registered openings in the leaf spring and rear end of the mouth sac so that the shank projects into the hollow interior of the head. The rivet is held in place by a speed nut, i.e. a friction nut, 36 engaging the projecting rear end of the rivet.

As indicated previously, I also provide a sounding means having a sound passageway leading to the mouth cavity so that the sound issuing from the sounding means will be improved in timbre by the acoustical features of the hollow bulbous sac these constituting, firstly, the bulbous shape of the sac which acts as a resounding or amplifying chamber and, probably secondly, the mildly stretched side walls 38 which tend to act as elastic stretched membranes, i.e. somewhat like tympans or, in other words, are tympanoidal.

The sounding means can be mounted directly on the sac itself so that the sound issues therefrom directly into the mouth cavity, or the sounding means may be spaced from the mouth cavity and connected to the sac, as by a conduit. In either event the sound created by the sounding means will pass into the bulbous mouth cavity where it will be rendered more mellow and therefore more human-like in quality and thereafter will issue from between the parted lips of the doll whereby the doll actually seems to be speaking.

In the illustrated form of my invention I have shown the sounding means mounted directly on the sac and consisting of a simple noisemaker 40. Such noise-makers are particularly inexpensvie, but ordinarily produce a raucous sound which is neither particularly pleasing to the ear nor simulative of a human voice. However with the assistance of the resonant bulbous tympanoidal chamber provided by the mouth sac 28, as shaped by the spring 30, this raucous sound is altered to instill a pleasant quality thereto whereby from such an inexpensive noisemaker a human-like voice ultimately will issue through the parted lips of the doll.

Specifically, the noisemaker 40 is of the reed type and consists of a tubular casing 42 having one externally annularly grooved end fastened in an aperture 44 provided in a side wall 38 of the bulbous sac 28. Housed within the casing is a conventional reed type squawker consisting, for example, of a metal reed so supported at its center over a boat-shaped elongated shell that the ends of the reed are free to vibrate. When air is passed through a tube containing such a reed one end or the other of the reed will vibrate depending upon the direction of passage of air. Thus one sound will be created by one end of the reed upon inhaling movement of air through the doll's mouth and the other end of the reed will be actuated by exhaling of air through the doll's mouth.

The bulging sac 28 is imperforate except for the mouth opening between the lips and except for the aperture 44 so that when the torso or head of the doll is squeezed air from within the doll will pass through the noisemaker in an exhaling direction and when the torso (or head) is released air will pass in an inhaling direction through the noisemaker back into the doll.

As I have pointed out previously the chamber formed by the bulging hollow mouth sac acts to improve and deepen the quality of the raucous sound generated by the noisemaker. I believe this is due in part to superior amplification by the chamber of the lower end of the spectrum of noise created by the noisemaker and particularly to the suppression or minimization of the higher end of the spectrum of such noise so that, as a result, a rather pleasing quality of voice issues from between the doll's lips. However this improvement may be employed even

where the sounding mechanism is not a noisemaker, i.e. where a soundmaker is utilized which produces single or plural tones as distinguished from noise or where the soundmaker is such as to produce a song or speech. In all of these last named cases the resonant quality and soft texture of the chamber and the tympanoidal quality of at least one of the walls of the bulbous sac exert an improving influence on the quality of sound, softening harsh portions and enhancing the lower range of the sound spectrum so that a most pleasing voice is heard.

In the form of my invention being described the lips are urged by the reaches 32 of the leaf spring into a rather widely parted position. In the fully opened position of the lips which they would assume under the influence of the leaf spring were no other forces exerted thereon, the lips would be spread apart slightly more, e.g. about ⅛" more depending upon the size of the doll's head, than would seem to be natural. However the lip actuator now to be described biases the lips to closed position, the bias being sufficiently strong to overcome the opening bias of the leaf spring 30 so that when the lip actuator is idle the lips will be closed (as shown in FIG. 4) and when the lip actuator is moved to its other extreme (FIG. 5) the lips will open to the maximum extent permitted by said actuator, being so urged by the leaf spring 30. This latter position is shown in FIG. 5. Attention is directed to the fact that when the lip actuator is manipulated to spread its forward ends to their maximum extent as shown in FIG. 5, said ends are spaced apart a distance less than the maximum vertical dimension of the bulging sac so that the actuator cannot slip rearwardly off the sac.

The lip actuator which is, in general, referred to by the reference numeral 46 and which is shown apart from the doll in FIG. 3, essentially comprises two pivotally interconnected bell crank levers 48, 50. The rear bell crank lever 48 includes a vertical reach 52 terminating in a manipulatable handle 54 which, for convenience, may be slightly wider than the reach 52. Said bell crank lever 48 further includes a forwardly extending horizontal reach 56 which terminates in a downwardly and forwardly extending tip (forward end) 58. The tip 58 is transversely elongated and is provided with a lower slightly downwardly convex edge 60 the outer ends of which have rearwardly extending tabs 62. The distance between the tabs is slightly in excess of the side-to-side external dimension of the bulging sac 28.

The front bell crank lever 50 includes a generally vertical reach 64. Actually this reach has a rearward slope to enable said reach to converge toward the rear bell crank lever 48 adjacent the pivotal interconnection of the two arms. The lower end of the reach 64 terminates in a manipulatable broadened handle 66. The front bell crank lever 50 also has a forwardly extending horizontal reach 68 terminating in a forwardly and upwardly sloping tip (forward end) 70. Said tip at its extremity is transversely elongated and is formed with an upper slightly downwardly concave edge 72 the outer ends of which are provided with rearwardly extending tabs 74. The spacing between the tabs 74 is the same as that between the tabs 62. Optionally the tabs 62, 74 can be omitted since the concave shapes of the edges 60, 72 tends to prevent lateral shifting of the lip actuator relative to the bulging sac.

The two bell crank levers are suitably inter-connected by pivotal means for relative rotation about a transversely disposed horizontal axis to the rear of the bulging sac 28. Desirably, although not necessarily, said horizontal axis is approximately centered with respect to the top and bottom of the sac. In the preferred form of my invention said horizontal axis is substantially perpendicular to the side walls of the sac.

The pivotal means may simply constitute a pinned connection joining the two bell crank levers; however, to reduce the number of parts employed I utilize instead a trunnion type of pivotal connection. More specifically, the vertical reach 52 of the rear bell crank lever 48 is formed at the zone where the pivotal connection is to be located with a pair of forwardly extending fingers 76 one at each side of said reach. Said fingers are provided with transversely registered openings. The zone of the front bell crank lever 50 between the vertical reach 64 and the horizontal reach 68 is formed with a rearwardly and upwardly offset jog 78 from the opposite edges of which integral stub trunnions 80 extend. These trunnions are rotatably received in the openings in the fingers 76 to provide the desired pivotal interconnection.

For the purpose of economy and simplicity of fabrication the two bell crank levers are fashioned from sheet metal and may be provided at various points along their lengths with stiffening ribs 82.

The horizontal reach 56 of the rear bell crank lever extends forwardly over the top of the mouth sac and the horizontal reach 68 of the front bell crank arm extends forwardly beneath the bottom of the mouth sac. The bell crank levers are so configured that when the manipulative handles 54, 66 are respectively adjacent the interior surfaces of the front and back of the doll's torso the tips (forward ends) 58, 70 of the two bell crank levers will squeeze the lips into closed position (as shown in FIG. 4). However when the torso is squeezed in a front-to-back direction as shown in FIG. 2 so that the manipulative handles are shifted toward one another the tips of the bell crank levers will move apart permitting the leaf spring 30 to open the lips (as shown in FIG. 5). Thus the inner surfaces of the lips will follow the upper and lower edges of the forward ends of the bell crank arms. When the handles 54, 66 touch one another the space between the forward ends of the bell crank levers is less than the maximum height of the bulging sac.

Means is included to bias the manipulative handles 54, 66 apart (i.e. bias the forward ends 58, 70 together) with a force sufficient to overcome the opening bias of the leaf spring 30. Said means simply comprises a second leaf spring 84 having its lower end anchored, as by spot welding, to the forward surface of the manipulative handle 54. Said leaf spring is inclined upwardly and forwardly and has its forward edge bearing against an intermediate portion of the upwardly and rearwardly inclined vertical reach 64 of the bell crank lever 50, thereby urging said vertical reach away from the vertical reach 52 and thus causing the tips 58, 70 to close the doll's lips when no pressure is exerted on the handles 54, 66.

Attention is directed to FIG. 4. It there will be seen that, due to the C-shape of the leaf spring 30 and the outwardly concave shape of the reaches 32, the forward portions of the firmed external surface of the sac at the top and bottom thereof are sloped quite steeply forwardly at an angle, for example, of approximately 45°. The tips 58, 70 of the lip actuator rest on these firm sloped external surfaces and therefore tend to be biased or guided forwardly into engagement with the inside surface of the lips. However this action is, so far as the lip actuator is concerned, floating, that is to say there is no positive or direct connection between the lip actuator and the mouth sac. Indeed there may be, as shown, narrow spaces between the tips of the lip actuator and the inside surfaces of the lips, and the tips of the lip actuator may be located anywhere within these spaces. The firm sloping surfaces of the forward portions of the sac automatically will guide the lip actuator to approximately the proper position for correct actuation. Any deviation from exactly correct position will be unnoticeable and since the lip actuator is free to move about to a limited extent, it will automatically seat itself in correct position upon handling of the doll. Indeed, correct position is a misnomer since the doll will work satisfactorily so long as the tips of the bell crank levers are near, although not against, the inside surface of the lips.

To operate the doll a child simply squeezes the torso from the front and back.

Before squeezing, the lips of the doll are closed (as shown in FIG. 1) and the mouth of the bulging sac is held closed by the action of the spring 84 through the bell crank levers. As soon as the bell crank handles are squeezed together the force of the spring 84 is overcome and the spring 30 is permitted to open the lips.

As the torso of the doll initially is squeezed, air pressure will be built up internally so that as the lips open a pulse of air will pass through the noisemaker 40, causing a steep-fronted wave of sound to be created by the noisemaker. This resembles the sound of a stopped labial consonant. Thereafter if the squeezing is continued, the noisemaker will continue to generate an exhale sound. Such sound passes from the noisemaker into the mouth cavity defined by the resonant bulbous tympanoidal sac where, after amelioration of its quality, it will pass out through the parted lips of the doll. The continually changing position of the lips and the consequent continually changing shape of the mouth cavity during the generation of the exhale sound modifies that sound as it issues from between the lips of the doll and such continuous modification causes the final sound to resemble a human voice with its constantly changing inflections and tonal qualities.

Releasing the squeezed together handles of the bell crank levers closes the lips against the action of the spring 30 and during the closing action draws in air through the mouth to create another (inhale) sound which likewise passes from the noisemaker through the mouth sac and out of the still parted doll's lips, being cut off when the lips close. Movement of the lips during closing also modifies the inhale sound of the noisemaker, so that it too in conjunction with the changing shape of the mouth cavity creates a resemblance to a human voice.

In the just described form of my invention I have shown the bulbous mouth sac used to define a hollow resonant mouth cavity which improves the tonal quality of the sound generated by the soundmaker, said sac being employed in cooperation with a lip actuator including a pair of non-crossed bell crank levers that bias the lips to closed position so that when the handle ends of the levers are squeezed together the mouth is permitted to open. In the form of my invention illustrated in FIGS. 8–11 I have shown how the bulbous mouth sac can be differently employed without utilizing said sac as a hollow resonant chamber and at the same time have illustrated the sac in connection with a lip actuator including a crossed (as distinct from non-crossed) pair of bell crank levers so that upon actuation of the lip actuator the lips are moved from a normally open to a closed position; said lips resume their normally open position when the lip actuator is released.

The doll in which this modified form of my invention is incorporated is the same as the doll 10 and includes a face with lips 24, 26 and a mouth sac 28, all having an as-molded configuration such as shown in FIG. 7. However, instead of employing an open-sided leaf spring such as the circular spring 30 to bulge the sac, I place a firming solid insert 86 within the mouth sac to bulge the same. The insert is approximately of the shape of a prolate spheroid having a forward truncated end 88 facing the lips.

The insert has a volume which is slightly larger than the volume of the corresponding portion of the sac so that when the insert is thrust into the sac between the lips it will completely fill and slightly expand the associated portion of the sac and thereby cause this portion of the sac to assume a shape similar to but larger than (by the thickness of the sac) the shape of the insert. Hence the sac takes on a firm bulbous shape. It swells both vertically and horizontally. It should be pointed out that the horizontal, i.e. transverse, swelling is not necessary to my invention and, if desired, the insert may be vertically truncated at both sides, making certain however that its volume is slightly in excess of the volume of the corresponding portion of the sac so that this portion will be completely filled by the insert. The bulbous shape the sac is caused to assume by insertion of the insert is such that the forward exterior surfaces of the sac converge forwardly and downwardly for cooperation with a lip actuator.

Although the insert tends to hold its place securely, that is to say is not easily displaced by a child poking around in the mouth cavity with an implement, it is nevertheless advantageous to anchor the same in position and for this purpose the insert is horizontally centrally bored in a front-to-back direction to receive a tube 90 the rear end of which passes through the rear end of the sac and into the open hollow interior of the doll's head. Annular flanges 92 formed on the exterior of the tube 90 engage the interior and exterior surfaces of the sac where it is pierced by the tube to prevent longitudinal movement of the tube and the insert which is constricted tightly about it.

Optionally a soundmaker may be used with the sac 28 of this modified form of my invention, the same, for example, constituting a reed type noisemaker 94 which is inserted into the open front end of the tube. Since the bulbous sac is almost wholly filled by the solid insert the quality of the sound generated by the noisemaker 94 is not markedly improved by said sac. But because the noisemaker is in communication with the sac, opening as it does directly into the sac, the sound generated thereby will pass out through the lips of the doll in a realistic manner.

The lip actuator for the insert expanded sac 28 is denoted by the reference numeral 96, the same being illustrated apart from the doll (with the sac 28 shown in phantom lines) in FIG. 9. Said actuator constitutes a pair of crossed bell crank levers 98, 100. The lever 98 includes a vertical reach 102 and a horizontal reach 104. The lever 100 includes a vertical reach 106 and a horizontal reach 108. The two vertical reaches are flat and their planes are juxtaposed and extend in a front-to-back direction within the doll. These reaches 102, 106 are pivotally inter-connected by a horizontal pin 112 which is approximately at the level of the center of the sac although this is not critical. The vertical and horizontal reaches are located to one side of the sac, e.g. the left side as viewed from the top of the doll (see FIG. 10).

At its front end the horizontal reach 104 carries an integral transversely extending horizontal bar 114 which passes below the sac adjacent the zone where the sac is unitarily joined to the lower lip. At its front end the horizontal reach 108 carries an integral transversely extending horizontal bar 116 which passes above the sac adjacent the zone where the sac is unitarily joined to the upper lip. The lower bar 114 has a slightly concave upper edge and the upper bar 116 has a slightly concave lower edge. Both bars are located adjacent but not touching the inside surface of the lips and are positioned to contact the forwardly tapering upper and lower exterior surfaces of the bulbous sac so that the lip actuator floats in place and tends to ride forwardly on the sac. The actuator will not distort the shape of the mouth when manipulated since it has no positive connection with the sac and thus the actuator will automatically maintain itself in position.

The maximum vertical dimension of the exterior surface of the sac is less than the distance between the facing edges of the transverse bars 114, 116 when said bars are spaced apart the maximum permissible distance allowed by the construction of the bell crank levers (abutment of the lever handles against one another). The same features hold true of the first described form of my invention. This relative dimensioning of the parts prevents the lip actuator from becoming accidentally disengaged from the sac. Sidewise movement of the lip actuator relative to the sac is inhibited by the concave

shape of the surfaces of the bars which face the external surface of the sac.

The lower ends of the two vertical reaches 102, 106 are turned at right angles to said reaches in order to form manipulatable handles 118, 120 which are designed to lie adjacent the internal surfaces of the torso at the back and abdomen respectively.

The insert 86 is fabricated from an elastomeric material such, for instance, as natural or artificial soft rubber or foam rubber and therefore exerts a biasing action tending to hold the lips open and also spreading apart the transverse bars 114, 116 so as to spread apart the handles 118, 120.

When the handles are squeezed together by squeezing the doll's torso the lip actuator will move the lips from their normally open position into which they are biased by the insert 86 to a closed position and concurrently with such closing movement will by the bellows action of the doll's torso force air through the tube 90 and noisemaker 94 to generate a sound. When the torso is released the insert 86 will spread the actuator handles 118, 120 apart and will reopen the lips. Concurrently therewith air will be drawn into the torso of the doll through the tube 90 and noisemaker 94 so as to cause the doll to utter a second sound.

It thus will be seen that I have provided devices which achieve the several objects of my invention, and which are well adapted 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 embodiments set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

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

1. In combination in a doll, a doll's head having a face of soft flexible resilient material, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, resilient firming insert means within the sac, said insert means being constructed, shaped and dimensioned to engage the top and bottom inner surfaces of the sac from the front to the back thereof so as to spread the sac and thereby impart to the sac a firm bulbous configuration at least in a vertical plane such that the roof and bottom of the sac flare away from one another rearwardly from the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, and manually manipulatable means interconnected with said elements to move said elements toward and away from one another, said manually manipulatable means being restricted in its element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac.

2. A combination as set forth in claim 1 wherein the resilient firming insert means is solid.

3. A combination as set forth in claim 1 wherein the resilient firming insert means is hollow.

4. A combination as set forth in claim 1 wherein the resilient firming insert means is spheroidal.

5. A combination as set forth in claim 1 wherein the resilient firming insert means is a C-shaped leaf spring.

6. A combination as set forth in claim 1 wherein the manually manipulatable means comprises crossed pivotally interconnected bell crank levers carrying said elements.

7. In combination in a doll, a doll's head having a face of soft flexible resilient mateiral, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, said spread lips providing a passageway from the sac to the atmosphere, said sac having a bulbous configuration flaring rearwardly from an open end at the lips, and a soundmaker having a sound passageway connected to a portion of the interior of the bulbous sac rearwardly of the open end of the sac.

8. In combination in a doll, a doll's head having a face of soft flexible resilient material, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, resilient firming insert means within the sac, said insert means being constructed, shaped and dimensioned to engage the top and bottom inner surfaces of the sac from the front to the back thereof so as to spread the sac and thereby impart to the sac a firm bulbous configuration at least in a vertical plane such that the roof and bottom of the sac flare away from one another rearwardly from the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, and manually manipulatable means interconnecting with said elements to move said elements toward and away from one another, said manually manipulatable means being restricted in its element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac, said lip actuator floating within the doll and having said elements guided forwardly toward the inside surfaces of the lips by the flaring configuration of the forward portion of the sac.

9. In combination in a doll, a doll's head having a face of soft flexible resilient material, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, resilient firming insert means within the sac, said insert means being constructed, shaped and dimensioned to engage the top and bottom inner surfaces of the sac from the front to the back thereof so as to spread the sac and thereby impart to the sac a firm bulbous configuration at least in a vertical plane such that the roof and bottom of the sac flare away from one another rearwardly from the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, manually manipulatable means interconnected with said elements to move said elements toward and away from one another, said manually manipulatable means being restricted in its element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac, and means biasing the elements toward one another with sufficient force to close the lips against the resiliency of the insert.

10. A combination as set forth in claim 9 wherein the sac has an open end at the lips, and wherein a soundmaker is provided within the doll having a sound passageway connected to a portion of the interior of the bulbous sac rearwardly of the open end of the sac.

11. In combination in a doll, a doll's head having a face of soft flexible resilient material, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, resilient firming insert means within the sac, said insert means being constructed, shaped and dimensioned to engage the top and bottom inner surfaces of the sac from the front to the back thereof so as to spread the sac and thereby impart to

the sac a firm bulbous configuration at least in a vertical plane such that the roof and bottom of the sac flare away from one another rearwardly from the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, said elements having matched sides facing the sac, and manually manipulatable means interconnected with said elements to move said elements toward and away from one another, said manually manipulatable means being restricted in its element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac.

12. In combination in a doll, a doll's head having a face of soft flexible resilient material, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, resilient firming insert means within the sac, said insert means being constructed, shaped and dimensioned to engage the top and bottom inner surfaces of the sac from the front to the back thereof so as to spread the sac and thereby impart to the sac a firm bulbous configuration at least in a vertical plane such that the roof and bottom of the sac flare away from one another rearwardly from the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, and manually manipulatable uncrossed pivotally interconnected bell crank levers carrying said elements to move said elements toward and away from one another, said bell crank levers being restricted in their element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac.

13. In combination in a doll, a doll's head having a face of soft flexible resilient material, said face including a pair of spread lips and an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, hollow resilient firming insert means within the sac, said insert means being constructed, shaped and dimensioned to engage the top and bottom inner surfaces of the sac from the front to the back thereof so as to spread the sac and thereby impart to the sac a firm bulbous configuration at least in a vertical plane such that the roof and bottom of the sac flare away from one another rearwardly from the lips, said sac having an open end at the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, manually manipulatable means interconnected with said elements to move said elements toward and away from one another, said manually manipulatable means being restricted in its element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac, and a soundmaker having a sound passageway connected to a portion of the interior of the bulbous sac sac rearwardly of the open end of the sac.

14. A combination as set forth in claim 13 wherein the sac has at least one stretched tympanoidal side wall.

15. A combination as set forth in claim 13 wherein the sac has at least one pair of opposed stretched tympanoidal side walls.

16. In combination in a doll, a doll's head having a face of soft flexible material, said face including a pair of lips biased to an open position, an internal hollowed sac in one piece with the face and having the forward portion thereof integrally joined to the lips, said sac having a bulbous configuration flaring rearwardly from an open end at the lips, a lip actuator including a pair of elements extending transversely across the sac adjacent the inside surfaces of the lips, manually manipulatable actuating means interconnected with said elements to move said elements toward and away from one another, means biasing the elements toward one another with sufficient force to close the lips, said doll including a body with a hollow chamber having at least one resilient wall which is forced inwardly to reduce the volume of the chamber when the actuating means is manipulated to open the lips, said sac having a bulbous configuration flaring rearwardly from an open end at the lips and an air actuated sounding means within the body and having a sound passageway connected to a portion of the interior of the bulbous sac rearwardly of the open end of the sac, said sounding means being connected to the hollow chamber so as to be actuated when the volume of the chamber is reduced, whereby when the actuating means is manipulated to open the lips a stopped labial consonantal sound will issue from between the doll's lips.

17. In combination in a doll, a doll's head having a face of soft flexible material, said face including a pair of separate lips, manually manipulatable actuating means including means located internally of the head for opening and closing the lips, a hollowed sac within the head in one piece with the face and having the forward portion thereof integrally joined to the lips, said sac at least in vertical plane having a firm bulbous configuration flaring rearwardly from an open end at the lips, and the configuration of the sac being varied as the lips open and close, said manually manipulatable actuating means including a pair of elements movable toward and away from one another and extending transversely across the sac adjacent the inside surfaces of the lips with one of the elements immediately above and one of the elements immediately below the sac, said manually manipulatable actuating means being restricted in its element opening movement to space the elements apart a distance less than the maximum vertical height of the sac whereby the elements are captively retained between the inside surfaces of the lips and the maximum vertical height of the sac, said doll having a hollow chamber with at least one resilient wall the position of which is altered when the actuating means is manipulated to move the lips, and an air actuating sounding means within the body and having a sound passageway connected to a portion of the interior of the bulbous sac rearwardly of the open end of the sac, said sounding means being connected to the hollow chamber so as to be actuated when the volume of the chamber is changed, so that when the manually manipulatable means is actuated a sound is generated by the soundmaker and is introduced into the sac from which it passes out from between the lips of the doll, said sound being modulated by the changing position of the lips and the changing configuration of the sac.

18. In combination in a doll, a doll's head having a face of soft flexible material, said face including a pair of separate lips, manually manipulatable actuating means including means located internally of the head for opening and closing the lips, a hollow sac within the head in one piece with the face and having the mouth thereof integrally joined to the lips, and the configuration of the sac being varied as the lips open and close, said doll having a hollow chamber with at least one resilient wall the position of which is altered when the actuating means is manipulated to move the lips, said sac having a bulbous configuration flaring rearwardly from an open end at the lips and air actuating sounding means within the body and having a sound passageway connected to a portion of the interior of the bulbous sac rearwardly of the open end of the sac, said sounding means being con-

nected to the hollow chamber so as to be actuated when the volume of the chamber is changed, so that when the manually manipulatable means is actuated a sound is generated by the soundmaker and is introduced into the sac from which it passes out from between the lips of the doll, said sound being modulated by the changing position of the lips and the changing configuration of the sac.

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