

Feb. 22, 1966

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CHANGEABLE FEATURE MECHANISM FOR TOYS AND ANIMATED
PHYSIOGNOMICAL FIGURES

3,236,006

Filed Aug. 5, 1963

3 Sheets-Sheet 1

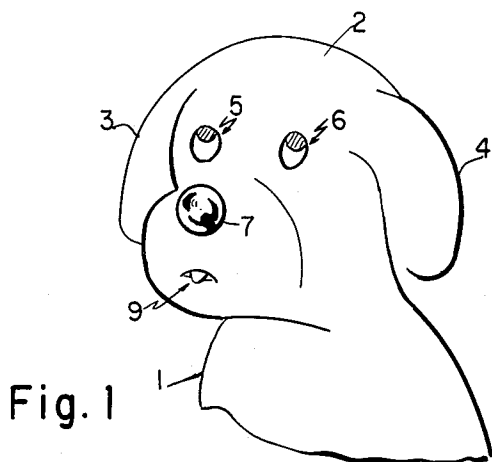


Fig. 1

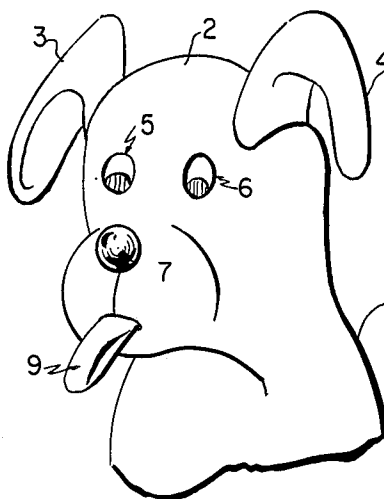


Fig. 2

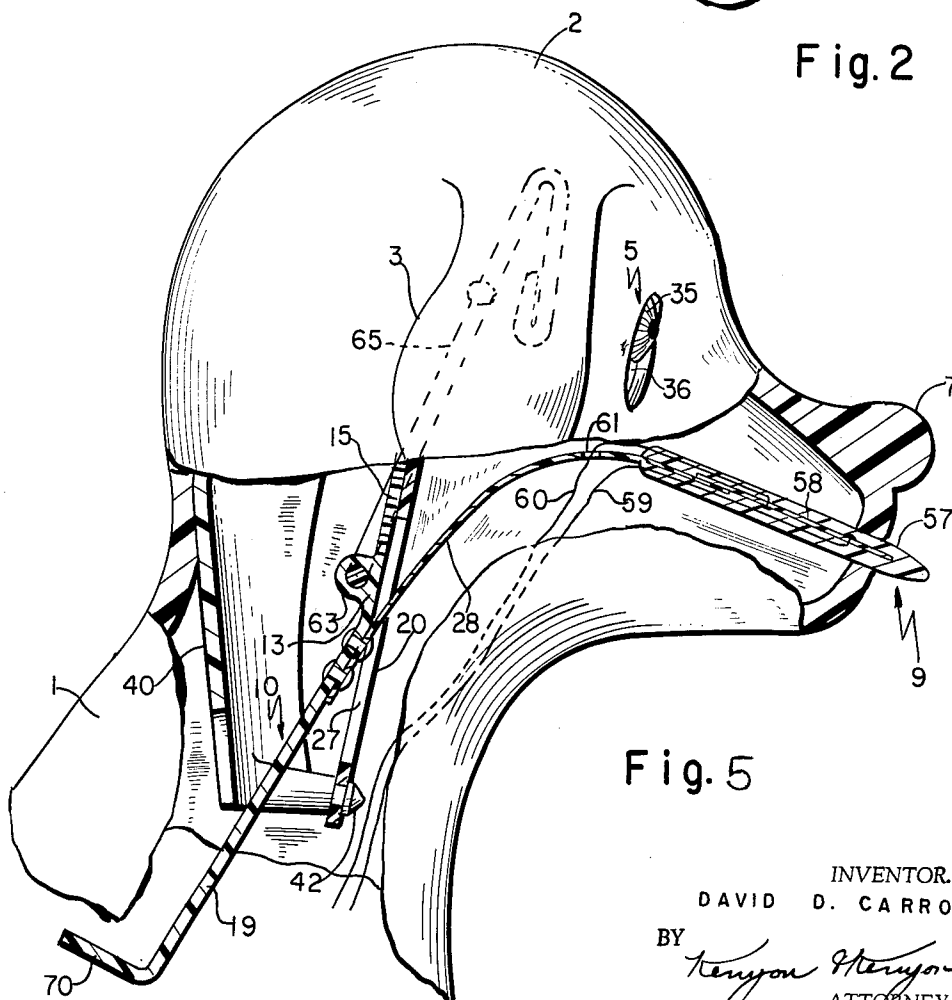


Fig. 5

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3 Sheets-Sheet 2

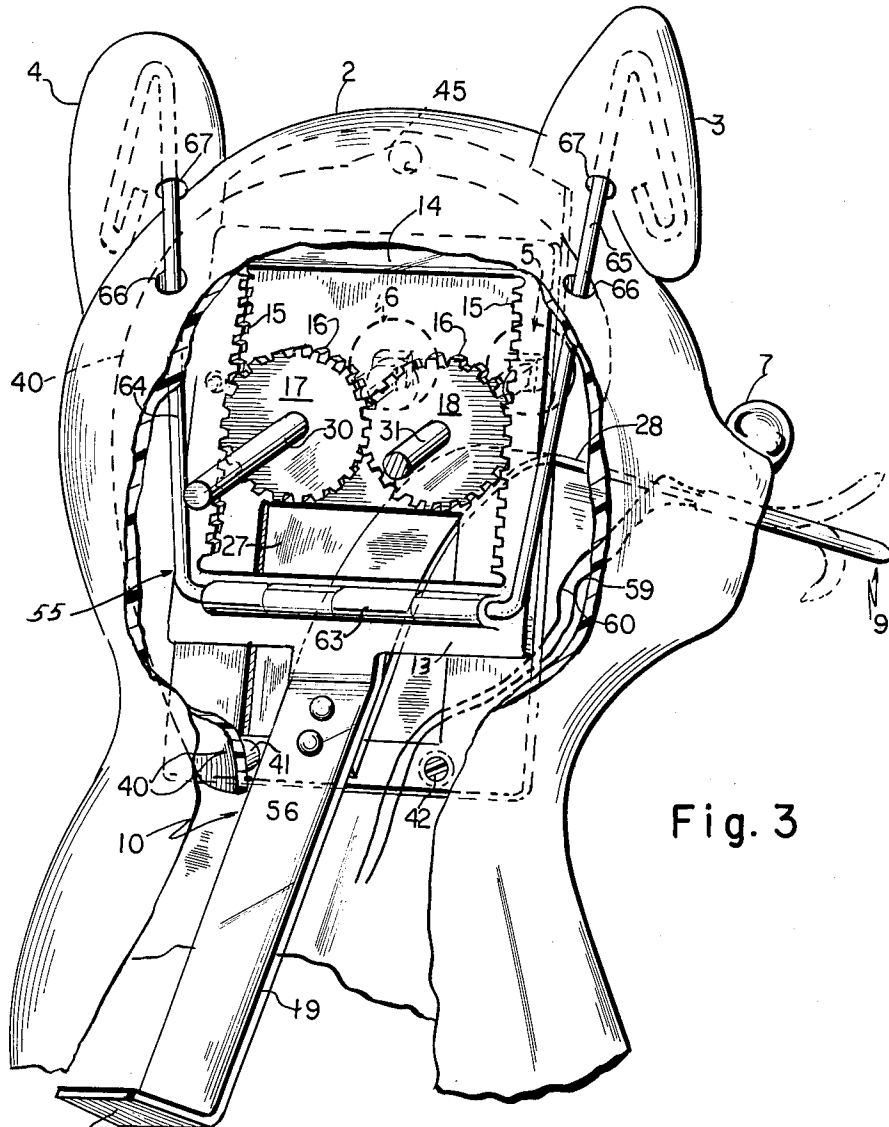


Fig. 3

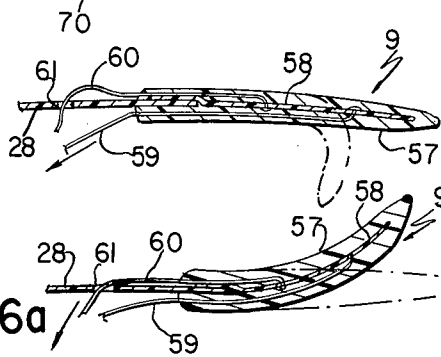


Fig. 6

Fig. 6a

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3 Sheets-Sheet 3

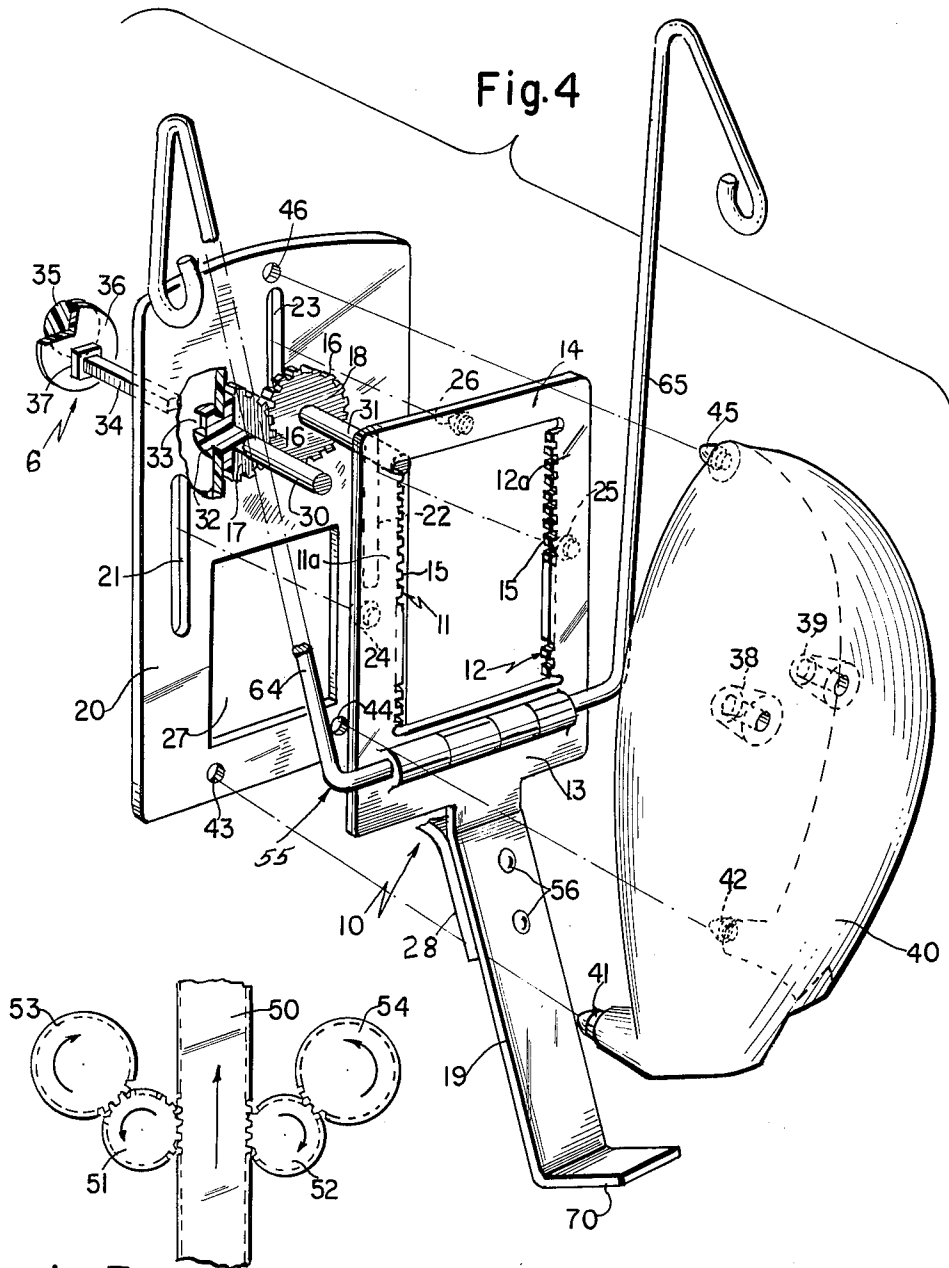


Fig. 7

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CHANGEABLE FEATURE MECHANISM FOR TOYS AND ANIMATED PHYSIOGNOMICAL FIGURES

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Filed Aug. 5, 1963, Ser. No. 299,772

13 Claims. (Cl. 46—135)

This invention relates to animated physiognomical figures and more particularly to the coordinated animation of the eyes, ears and tongue of a toy, animal, a manikin, or other physiognomical configurations.

The aim of the toy industry to animate stuffed or other toy figures' facial features has always been hampered by the need for rigid anchorage of mechanical parts in any skull heretofore devised. This limitation has resulted in the use of metals, wood and other rigid materials which have usually contributed to the item's hurtfulness in children's accidents, costly breakage of component parts, difficulty of repair, restriction of movements obtained from the animal and other undesirable consequences.

Heretofore it also has not been possible in factory production to insert easily, safely and inexpensively working mechanisms into a fabric "skin" or other kinds of shaped exteriors for the heads of animals. The instant invention supplies that need and imparts even to a soft-structured head animations heretofore limited to rigid robot devices. Indeed, the present invention offers a coordinated "personality" animation never achieved by earlier rigidly constructed devices.

The materials used in this invention are non-corroding, impervious to atmospheric change, inexpensive, require no lubrication, batteries or upkeep. Moreover, the invention is strongly resistant to breakage by blows, tumbling and usual hazards of children's play.

The invention is not limited to toys but can be used for numerous other purposes, notably coin banks, animated displays and similar novelty uses. It is adaptable to figures or manikins as well as to a wide range of animals. When used for a figure or maniken, the devices employed in lifting an animal's ear could be modified to lift the character's hat, pop up a separate toy or signs, or to accomplish other novel effects.

In Carroll co-pending application Serial No. 69,733 now Patent No. 3,099,894 for Stuffed Animated Toy Animal is disclosed a mechanism for animating the facial features of a stuffed toy animal wherein the eyes of the animal are rotated by a lever type mechanism.

The improvement disclosed in the present invention is that by employing the rack and pinion principle, the scope of previous animated motions is extended. For example, the animal's eyes in this invention can be made to turn farther than they would by use of the lever principle. Furthermore, the rack and pinion principle may be used in a smaller space than other mechanisms would permit. Finally, the rack and pinion method herein described permits more rapid assembly of the manufactured animal or figure from molded parts than other mechanisms would permit.

It is therefore an object of the present invention to provide an animated physiognomical figure whose facial features may be varied so as to offer a human-like personality that is variable with the operator's imagination.

It is another object of this invention to provide a simply stuffed animated toy that is pleasant to touch and fondle, thus having great appeal to children.

It is a further object of this invention to provide a stuffed animated toy that is extremely safe to use because of the soft padded contour and the nature of the animation mechanism.

It is a still further object of this invention to provide a physiognomical figure employing an animating mecha-

nism that requires no upkeep and which is strongly resistant to breakage.

Yet another object of this invention is to provide a physiognomical figure employing an animating mechanism that is versatile, compact and which permits rapid assembly of the manufactured animal.

Other and further objects and advantages of this invention will become apparent from the following description and drawings in which:

FIG. 1 is a perspective view of a dog as one animal embodiment showing a first expression or action;

FIG. 2 is a perspective view of the animal of FIG. 1 wherein a second expression or action has been elicited;

FIG. 3 is a semi-wear view of the animal of FIGS. 1 and 2 showing the actuating mechanism in outline and in phantom and having the mechanism positioned to elicit the animal action of FIG. 2;

FIG. 4 is an exploded view of the rack and pinion mechanism of FIG. 3;

FIG. 5 is a sectional view of the animal's head of FIG. 1 showing details of the mechanism;

FIG. 6 is a sectional view showing details of the tongue actuating mechanism and showing the tongue curved downwardly;

FIG. 6a is a sectional view of the tongue mechanism as in FIG. 6, but showing the tongue curved upwardly; and

FIG. 7 is a schematic of an alternative rack and pinion mechanism.

With reference to the drawings, an embodiment of this invention may comprise, in general, a stuffed toy animal body 1 provided with a stuffed generally hollow head 2. Head 2 is provided with unstuffed, movable ear members 3 and 4, eye members 5 and 6, nose member 7 and tongue member 9. Ear members 3 and 4, eye members 5 and 6 and tongue member 9, which are all separately formed from the general body 1 configuration, are free to move in patterns and by means to be hereinafter explained.

It is to be understood that though an animal is shown in the illustrations, and the word "animal" is consequently used herein, that term is also intended to cover manikins or other physiognomical configurations in the scope of this invention.

A comparison of FIGS. 1 and 2 will disclose that the invention may be so operated as to effect a radical change in the facial expression of the animal. The animal can change from an expression of sadness to alertness, anger, consternation and other moods while the ears and tongue simultaneously move with the eyes to exemplify the chosen emotion. Thus, we have a three-way coordination in FIGS. 1 and 2.

As shown in FIG. 3, the central mechanism for achieving these facial changes is a yoke 10 made of metal, fiber, wood or preferably, plastic or some similar material. Yoke 10 includes two vertical cogged racks 11 and 12 whose risers 11a and 12a are joined at their base by horizontal crossbar 13 and at their upper limits by horizontal crossbar 14. On the inside edges of the two vertical racks 11 and 12 are cogs or serrated spurs 15 which engage the cogs or spurs 16 of the two pinions 17 and 18. For additional accuracy, as illustrated, it is preferable that each pinion engage the other, though this is not essential since the working parts are locked into position.

Thus, when the handle 19 of yoke 10 is thrust upward, the cogged vertical risers 11a and 12a move upward, turn the pinions 17 and 18, pinion 17 turning counterclockwise and pinion 18 turning clockwise, the two pinions turning each other.

Pinions 17 and 18 are rotatably mounted on plate 20 in rounded apertures (not shown). Plate 20 is preferably plastic but may be made of any suitable material.

As shown in FIG. 4, plate 20 also has slot apertures 21, 22 and 23 for guide studs 24, 25 and 26, respectively, as well as aperture 27 for passage of tongue root 28 into the head. Studs 24, 25 and 26 are mounted on yoke 10. Plate 20 is not intended to be a portion of the instant invention, many other methods of mounting the mechanisms of the invention being readily apparent to those skilled in the art.

Pinions 17 and 18 are respectively mounted on round shafts 30 and 31. Bead shaped boss shanks such as 32 are mounted at one end of shafts 30 and 31, said shanks provided with square recesses such as 33. The boss shanks such as 33 are of resilient material such as plastic so that they may be snapped into plate 20 for rotatable fixation.

As shown in FIG. 4, square-cornered eyeshaft 34, made of metal, wood or some other suitable materials, preferably plastic, is snapped or is inserted and cemented into square hole 33 of the shank 32. From the point of its insertion into shank hole 33, eye shaft 34 is disposed through the head of the animal and emerges at the face side in the position where the eyes normally appear in the animal.

Affixed to the face end of eye shaft 34 is eye 6, made preferably of plastic or similarly moldable material. Eye 6 comprises a preferably black pupil 35, made of metal, wood or preferably plastic, and a white elliptical iris 36, preferably of white plastic pliable sheet stock. Pupil 35 is an essentially knob-like member that is surmounted at its rearmost portion by a square boss shank 37 having a square-cornered hole therein adapted to receive eye shaft 34 in close registration. This connection between the square boss shank 37 and its mated eye shaft 34 may be effected by snapping or by cementing, or black pupil 35 may be an integral part of square-corner eye shaft 34, in which case square boss shank 37 becomes unnecessary.

Iris 36 as shown in FIG. 4 is flat stock, preferably pliable plastic, leather or the like, and is elliptical in outline. A more elaborate convex eyeball is, of course, also moldable or stampable for use with or without pupil 35. Appearing in iris 36 at an eccentric position is a square hole adapted to mate with square boss 37 on pupil 35. Iris 36 is locked to pupil 35, which in turn is locked to eye shaft 34, which in turn is locked, or alternately molded, into boss shank 32 of pinion 17.

Alternately, but not illustrated, iris 36, whether flat or convex, may be permanently formed or affixed upon eye shaft 34, in which case the shape of a pupil may be printed, molded, or affixed upon iris 36. In such case, eye shaft 34 and shank hole 33 may be round.

Yoke 10 is slidably mounted on plate 20, such that the cogs of vertical racks 11 and 12 engage with cogs 16 of pinions 17 and 18 by a raised guide stud 26 situated in the center underside of the upper crossbar 14; and similar guide studs 24 and 25 respectively situated in the center underside of the vertical risers 11a and 12a. These three snap-in guide studs insure vertical up and down operation of yoke 10 without sidewise wobbling.

Wobbling or eccentric motion of pinions 17 and 18 is prevented by fitting shafts 30 and 31 into hollow tube-like sleeves 38 and 39 shown in FIG. 4 as projecting from the interior of a cap 40, preferably molded of plastic, which is secured to plate 20 by lock studs 41 and 42 which snap into apertures 43 and 44, respectively, at the lower edge of the plate 20, and by lock stud 45 which similarly snaps into hole 46 in the upper center of plate 20. This method of preventing the wobble of pinions 17 and 18 is illustrative only and other methods of preventing such wobble will be readily apparent to those skilled in the art.

An alternate, unillustrated use of the rack and pinion principle might employ only one vertical rack instead of two, the single vertical rack having cogs upon both of its vertical edges, said cogs engaging the cogs of two pinions similar to those illustrated. Action of the yoke 10 upon the single rack would produce a reverse motion of the

eyes from that product in our illustrated rack and pinion motion.

As shown schematically in FIG. 7, if the same direction of eye movement is desired, the single rack such as 50 must engage auxiliary cogged pinions such as 51 and 52 and in turn have the auxiliary pinions engage the cogs of pinions such as 53 and 54 directly connected with the eye shafts. As shown, the use of a single rack necessitates the use of two cogged pinions on each side of the single rack. Use of auxiliary pinions is a commonly known method for reversing the direction of pinion driven shafts. If the single rack construction is employed, the upper horizontal crossbar 14 will, of course, be eliminated; but the guide stud 26 will remain, being placed at the upper end of the single rack and mating with a slot underneath the single rack. Slots 21 and 22 in FIG. 4 would, of course, be eliminated from plate 20. Crossbar 13 in FIG. 5 would remain since it holds ear-lift 55.

On handle 19 of yoke member 10, at its lower end, a strip of pliable material 28, preferably plastic, is attached by eyelets 56 or by other suitable fasteners. As shown in FIG. 3, this pliable strip 28 constitutes a tongue root member and upon its upper end, as shown in FIG. 5, is mounted the actual tongue 9, also preferably made of plastic and more pliable than tongue root 28. Tongue root 28 plus tongue 9 are of such overall length as to traverse the interior of the animal's head with tongue 9 emerging prominently from the animal's face when the actuating mechanisms are positioned as in FIG. 3.

Alternately, tongue 9 may be merely a continuation of tongue root 28, thus making them one integral member. In such case, the tongue-ending emerging from the face must be lightened and made more flexible by narrowing its width at the bending point, for the pliability of tongue root 28 is not sufficient for the curlability described hereinafter.

Tongue 9, as shown in FIG. 3 and more particularly in FIGS. 6 and 6a, may be curable, in which case it will, as stated, be separately formed from a lighter plastic material than the tongue root 28 and will be affixed thereon by eyelets, stitching or similar fastening. In the preferred tongue curling embodiment illustrated, a separate exterior for the flexible tongue 9 is conventionally colored red and preferably made of a durable cotton fabric, heat-sealed plastic, or other suitable material for forming a tongue-resembling sheath 57 to fit over member 58 of tongue 9. This tongue sheath 57 is long enough to receive tongue member 58 and a portion of tongue root 28, to which it is affixed by eyeletting, riveting, stitching or similar fastening.

Two actuating pull members, comprising flat connecting strips, lacings or cords 59 and 60 as shown in FIGS. 6 and 6a are fastened by eyelet or rivet. As illustrated, cord 60 knots into a hole near the base of tongue member 58 so as to cause a free and continuous length of cord 60 to run along a portion of the upper surface of tongue member 58 and partway along the upper surface of tongue root 28 preferably passing through a hole 61 in tongue root 28 to come alongside second cord 59 on the under surface of tongue root 28. Second cord 59 knots into a hole near the free tip of tongue member 58 and proceeds along the underside of tongue member 58 and tongue root 28, both free ends of cords 59 and 60 emerging as draw-strings from the head or body of the animal. A pull upon cord 60 will product a flip upward of tongue 9 and a pull upon cord 43 will produce a downward curl of tongue 9. Naturally, the achievement of these motions requires that the tongue first be ejected from the face. Sheath 57 of tongue 9 is slipped over tongue member 58 and a portion of tongue root 28 after the cords have been attached. Cord 60 may actually continue along the upper surface of tongue root 27 instead of passing through hole 60 in tongue root 28; but the latter illustrated positioning is preferable for ease in operating upper cord 60.

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As shown in FIG. 3, ear motion is accomplished by the use of a U-shaped plastic or wire member 55 which is attached to the lower crossbar of yoke 10. The U-shaped ear-lift member 55 has pliability with sufficient rigidity to lift the weight of the animal's ears, which are usually of fabric material. Ear-lift member 55 is attached to the upper surface of crossbar 13 by snapping into molded tube-like sleeves 63 designed for that purpose, or by use of unillustrated staples or other mechanical fasteners designed commercially for such purposes.

Each vertical arm 64 and 65 of the U-shaped ear-lift 55 extends upwardly into the animal's head, passing through a hole such as 66 in the temple of the head's exterior which is usually but not necessarily made of fabric. Thence vertical arms 64 and 65 proceed outwardly of the head to pass almost immediately through a second hole such as 66, situated in the under surface of the animal's ear, usually made of fabric but not necessarily so, hole 40 being in that portion of ear 4 or 5 adjacent to the animal's temple and upper jaw. As shown, arm 64 passes through hole 40 into ear 4, where it forms a curvilinear arc and bends downward to a blunted end, thus avoiding snagging or tangling inside the ear. Arm 65 projects into ear 3 in a similar manner.

On factory assembly, the yoke is locked into position, then drawn downward until its lower crossbar 31 bottoms at rest upon lock studs 41 and 42 of cap 40. Then the pupils and irises are mounted upon the eye shafts in such a way that the elliptical iris points downwardly 180°. The mechanisms are permanently fixed in that relationship.

In operation, the various mechanisms coact as follows:

When yoke 10 is thrust upward to the position illustrated in FIG. 3, the expression illustrated in FIG. 2 is elicited. This is accomplished by the fact that by thrusting yoke 10 upward, the operator has also forced U-shaped ear-lift 55 attached to yoke 10 on lower crossbar 13 in an upward direction also. The curvilinear arc of ear-lift 55 rises within ears 3 and 4 which are borne upwardly into a pricked ear position.

When ear-lift 55 is in this upward position, the relation of eye shaft 34 to pupil 35 and iris 36, both affixed upon eye shaft 34, will be such as to present the eye expression shown in FIG. 2, wherein the eccentric portion of iris 36 is disposed upwardly of the animal's face, giving an alarmed or highly animated expression to the eyes.

Simultaneously, the vertical rack 11, engaging the cogs 16 of pinion 17, will have turned that pinion and its mounted eye shaft 34, said eye shaft communicating the turning motion to the pupil 35 and elliptical iris 36 mounted upon boss shank 37 outside the animal's head.

At the same time, as yoke 10 is caused to move upward, tongue root 28 attached thereto is also borne upwardly in an arc through the animal's head, an internal nose structure (not shown) guiding the tongue root 28 and tongue 9 out of the head and face. Any tubular structure being sufficient to that purpose; the nose is not part of this invention, many structural choices being available for that organ. As shown in FIG. 5, plate 20 affords an opening 27 for the passage of the tongue.

When tongue 9, by operation of the yoke 10, has been thrust outward of the face, it is in position to be curved upward, by a tug upon cord 60 lying free outside the head and body, or curved downward by a tug upon cord 59, likewise lying free outside the head and body. The flipping of the tongue upward lends impudence to the animal's expression, curving the tongue downward expresses a happier expression or surprise. Shifting the tug from one cord to the other produces a variation of moods, sometimes suggesting that the animal is "talking," eating, panting. Much latitude is given the operator; for instance, by forcing the elliptical iris 36 by hand into new positions upon the boss shank 37, a completely different range of zany expressions can be developed in the eyes. Then the addition of changing ear and tongue

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positions to these wilder eye expressions can produce ridiculous facial appearances.

If instead of thrusting yoke 10 upward, the operator draws it down until its lower crossbar 13 bottoms upon lock studs 41 and 42, the eyes will turn downward through varying moods to one of sadness, and the ears likewise will droop and the tongue virtually disappears as shown in FIG. 1.

It is possible to provide automatic aids to the operation of the invention. Reference has been made to the plate 20 upon which the mechanisms of this invention are conventionally mounted. It is clear, for example, that manual or motorized operation of the coordinated mechanisms can be achieved by supplying within the body of the animal a firm footing for the lower end 70 of yoke 10 and attaching thereto by eyelets, rivets or the like, one end of a flat tempered steel spring, then bending that spring doubleward to attach the upper free end of the spring to the underside of the conventional cap and plate heretofore described. Then compression of the spring downward will impart a thrust upward upon the yoke 10, setting the mechanisms in motion. Relaxing the pressure upon the tensioned spring will return the handle 70 of the yoke 10 downward until stopped by the yoke's lower crossbar 13 resting upon the locked studs 41 and 42. In place of a doubled strip of flat spring steel, a coiled compression wire spring could also be used, any pincer pressure upon the compression spring causing the yoke to rise and any relaxation causing it to draw downward as just described. A revolving cam, actuated by hand by a revolving wheel or by a motor-driven shaft can obviously impart to the yoke of the instant invention the impulse it requires for movement upward and downward.

It is also possible to have the lower member of yoke 10 bent, such that it protrudes through an opening in the back of the animal. The protruding portion could be covered with cloth or the like and have a tassel or other ornamentation affixed thereto. Alternatively, the protruding portion may be hinged such that it may be folded into the animal when not in use.

It is to be further understood that other animal or mannequin embodiments are contemplated, and particularly that other ear, eye and tongue configurations are contemplated. The inventor desires to be limited only by the appended claims and not by way of the materials and particular configurations set forth above, which are only by way of example.

What is claimed is:

1. An animated stuffed toy comprising a head, a pair of limp ears appended to said head, a pair of eyes at the face of said head, a pair of shafts, each of said shafts having mounted at one end thereof one of said eyes, a pair of pinions, one of said pinions being mounted on each of said shafts, yoke means having a pair of legs slidably disposed in said head at either side thereof and thence into each of said ears respectively, rack means mounted on said yoke means in engagement with said pinions, such that sliding of said yoke means up and down raises and lowers said ears and rotates said eyes.

2. The animated stuffed toy of claim 1, including in combination a tongue slidably mounted in said head in the front portion thereof, such that said tongue may be expelled and retracted from said head, tongue root means slidably contained within said head and affixed at one end to the rearmost portion of said tongue and at the other end to said yoke means, such that when said yoke means is slid up and down, said tongue is expelled and retracted.

3. The stuffed toy of claim 2, including in combination a plate, said shafts being rotatably mounted on said plate and said yoke means being in slidable engagement with said plate.

4. The stuffed toy of claim 3, including in combination, therewith, cover means mounted on said plate means, said cover means having a pair of recessed mountings on

its underside such that said shafts are rotatably positioned within said recesses.

5. The stuffed toy of claim 4, including in combination actuating means for causing said yoke to slide up and down.

6. The stuffed toy of claim 5, including cord means affixed to said tongue and slidably mounted in said head, such that manipulation of said cord means causes said tongue to curl upwardly or downwardly.

7. An animated stuffed toy comprising a head, a pair of limp ears appended to said head, a pair of eyes at the face of said head, a pair of eye shafts, each fixedly attached to one of said eyes and rotatably housed within said head from front to rear, a pinion fixedly mounted near the rear end of each of said eye shafts, yoke means having a pair of legs slidably disposed in said head at either rear side thereof and thence into each of said ears respectively, rack means affixed to said yoke means and in operational engagement with said pinions, a tongue, tongue root means slidably contained within said head and affixed at one end to the rearmost portion of said tongue and at the other end to said yoke means, whereby sliding of said yoke means up and down raises and lowers said ears and rotates said eyes and expels and retracts said tongue.

8. An animated stuffed toy comprising a head, a pair of limp ears appended to said head, a pair of eyes at the face of said head, a pair of eye shafts each provided with one of said eyes and rotatably housed within said head, a pinion fixedly mounted near the rear end of each of said eye shafts, the cogs of said pinions being in engagement with one another, yoke means slidably mounted within said head, said yoke means having a generally U-shaped member having a horizontal bottom member rotatably mounted on the upper surfaces of said yoke means and a pair of upwardly extending legs, said legs being slidably housed in said head, each of said legs terminating in each of one of said ears, rack means mounted on said yoke means and in engagement with said pinions, a tongue slidably mounted in said head in the front portion thereof such that said tongue may be expelled and retracted from said head, tongue root means slidably contained within said head and affixed at one end to the rearmost portion of said tongue and at the other end to said yoke means such that sliding said yoke means up and down causes said U-shaped member to raise and lower said ears, causes said rack means to rotate said pinions and said eyes, and

causes said tongue root means to expel and retract said tongue.

9. The animated stuffed toy of claim 8, including in combination a plate, said shafts being rotatably mounted on said plate and said yoke means being in slidable engagement with said plate along its rearward surface.

10. The animated stuffed toy of claim 9, including in combination cover means mounted on said plate means on the rearward surface thereof, said cover means having a pair of recessed mountings on its underside such that said shafts are rotatably positioned within said recesses.

11. The animated stuffed toy of claim 9, including in combination actuating means for causing said yoke means to slide up and down.

12. In an animated physiognomical figure such as a toy, mannequin or animated display, the combination comprising a head, a pair of eyes at the face of said head, a pair of eye shafts each provided with one of said eyes and rotatably housed within said head, each of said eye shafts being provided with a pinion and rack means slidably mounted in said head and in engagement with said pinions, an actuated member movably affixed to said head and actuating means operated by said rack means for imparting motion to said actuated member, said actuating means including a U-shaped member, said U-shaped member being in engagement with and operated by said rack means, said U-shaped member being provided with a pair of upwardly extending legs slidably positioned in and partially projecting from said head and being affixed to said actuated means such that sliding up and down of said rack means causes said pinions to rotate said eyes and said yoke to move said actuated member.

13. The animated figure of claim 12 including a tongue member slidably disposed within said head provided with a segment that is projectable outwardly and retractable inwardly said head, said tongue in operational relationship with said rack means, such that sliding of said rack means up and down causes said segment of said tongue member to project outwardly and retract inwardly of said head.

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