Feb. 16, 1954 H. P. STEWART 2,669,064

ANIMATED DOLL

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FIG. 1.

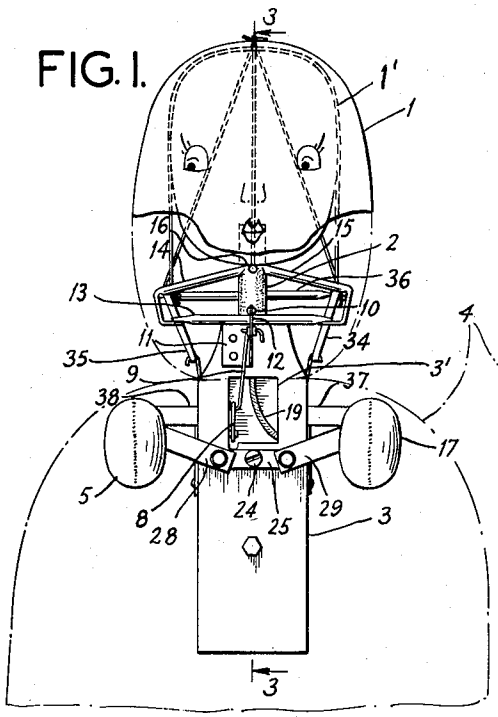
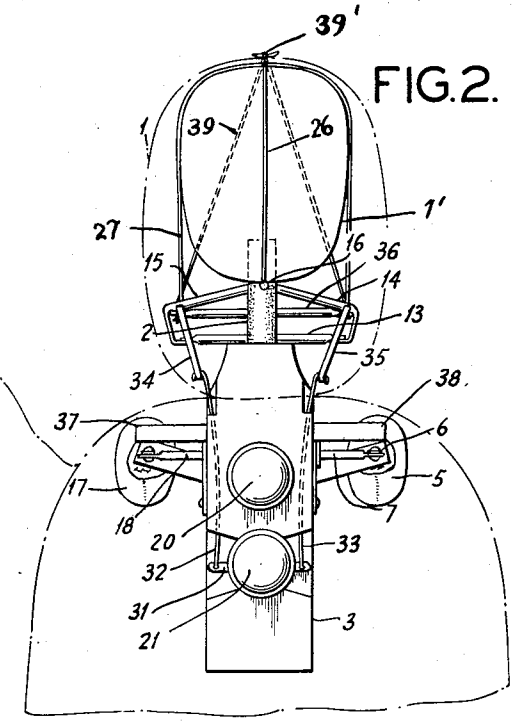


FIG. 2.



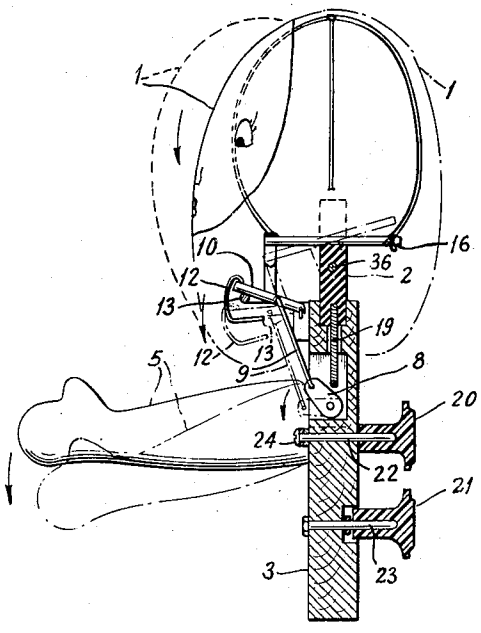


FIG. 3.

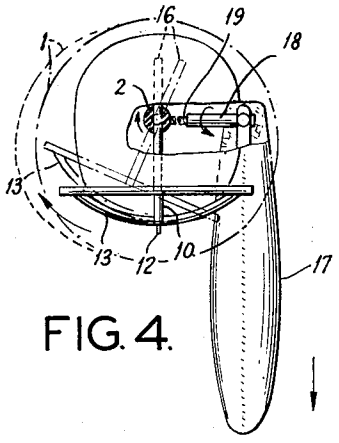


FIG. 4.

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FIG. 5.

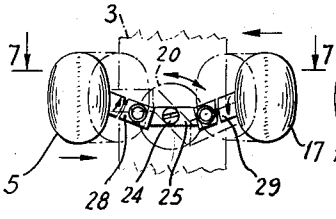


FIG. 6.

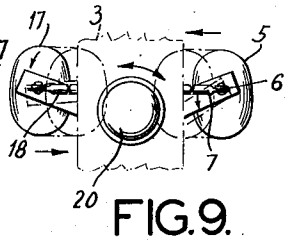


FIG. 7.

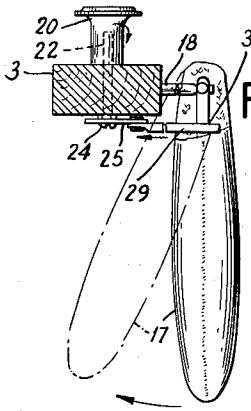


FIG. 9.

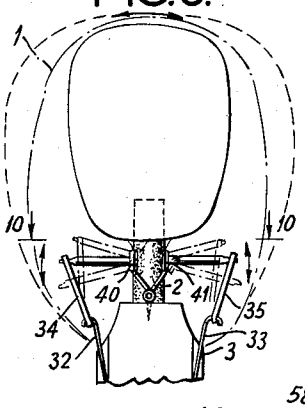
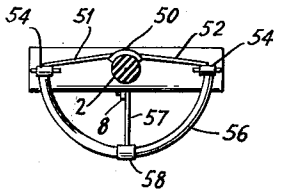


FIG. 12.



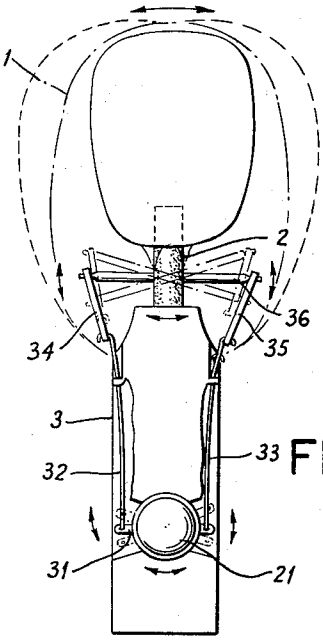
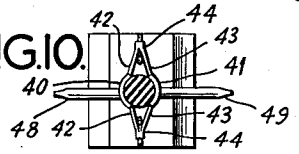


FIG. 8.

FIG. 10.



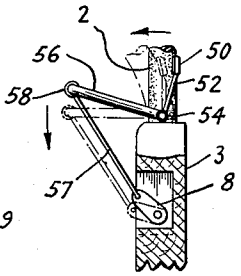


FIG. 13.

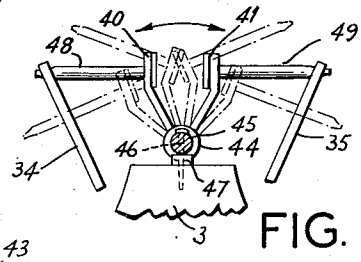


FIG. 11.

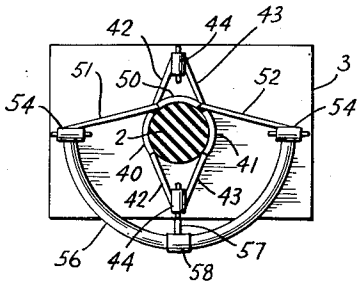


FIG. 14.

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UNITED STATES PATENT OFFICE

2,669,064

ANIMATED DOLL

Henry P. Stewart, New York, N. Y.

Application December 30, 1948, Serial No. 68,128

5 Claims. (Cl. 46—120)

1

This invention has to do with dolls and more particularly with animated dolls.

It has long been recognized that dolls with movable members are attractive to children and especially dolls with members connected to one another in such a manner that when an arm, for instance, is moved the head will also move. Many structures have been suggested for accomplishing this, the most common comprising gear trains and/or linkage arrangements including springs, clips, etc. In all prior devices with which I am familiar the coupling between the movable members is accomplished by elements rigid or stiff in themselves, or by wires or strings. The shortcomings of such devices are many, the outstanding being excessive weight, instability through lost motion between the movable members, difficulty of keeping properly adjusted, rattling, inability to stand abuse, in addition to high manufacturing costs.

These and other shortcomings of prior devices are overcome by my improved doll according to which the doll's head is flexibly supported and may readily be moved into different positions.

According to a feature of my invention flexible connections are included between the head and the members operated to move the head. These resilient connections permit the head to be moved without binding into different positions by different members, such as arms or other operating levers of the doll. At the same time these connections and support for the head are sufficiently rigid and stiff so that there is no lost motion, and movement of a particular member immediately produces a predetermined movement of the head.

According to my invention it is possible to move the doll's head by operating the arms in one manner and by turning suitable knobs on the doll to move the arms in another manner independently of the head. A feature of the invention is that the mechanism for accomplishing these movements may be mounted on a frame or block as a single, compact, inexpensive unit. Such a unit may be separately constructed and then inserted into the doll's body. In the case of dolls having stuffed interiors a suitable cavity is provided for the unit. Such a method of producing dolls lends itself readily to mass production techniques and relatively unskilled labor may be used.

These and other features of my invention will be made clearer from the following detailed description when taken in conjunction with the drawings, in which:

Fig. 1 is a front elevation partly broken away to show the inside of the doll;

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Fig. 2 is a rear elevation of the doll;

Fig. 3 is a section on lines 3—3 of Fig. 1;

Fig. 4 is a top plan view showing the doll's left arm and associated mechanism;

Fig. 5 is a front elevation of the mechanism that moves the doll's arms towards and away from one another;

Fig. 6 is a rear elevation of the mechanism shown in Fig. 5;

Fig. 7 is a top plan view on lines 7—7 of Fig. 5;

Fig. 8 is a rear elevation of a portion of the doll showing the mechanism controlling side tilting of the head;

Figs. 9–14 show an alternative construction for tilting the doll's head forward and sideways; Fig. 9 being a front elevation; Fig. 10 a top plan view of Fig. 9 on lines 10—10; Fig. 11 an enlarged side elevation of a portion of Fig. 9; Fig. 12 is a top plan view of the mechanism for tilting the head forward; Fig. 13 is a side elevation of Fig. 12; and Fig. 14 is a top plan view of a combination of features shown in Figs. 9 to 13, inclusive.

Head 1 of the doll is partially filled with stuffing 1' into which projects a resilient support 2, preferably a round piece of rubber or the like, commonly known as cord in the rubber trade. By the word "rubber" I mean not only the natural substance but also synthetic substances having rubber-like characteristics. The other end of rubber cord 2 is embedded in a supporting block or frame 3 which may conveniently be made of wood and is suitably inserted in a cavity in the outside shell or body portion 4 of the doll. I have found that a rubber cord having a diameter of about ½ inch has approximately the correct degree of flexibility and rigidity. If greater or lesser flexibility is desired the diameter of the cord may be appropriately varied.

By operating certain parts of the doll, head 1 may be made to move from its normal erect position into a plurality of positions, namely, nodding or tilting forward, turning and shaking or swaying sideways. It is also possible to move the doll's arms towards and away from one another as in clapping.

The nodding of the head is accomplished in the following manner: Right arm 5 is suitably fastened at 6 (Fig. 2) to one end of a rotatable shaft 7 projecting from the right side of block 3. Shaft 7 extends into cutout portion 3' (Fig. 1) of the supporting block and has a crank or link 8 mounted on its free end. Link 8 is connected by a wire 9 to a rod 10 pivotally mounted at one end to bracket 11 (Fig. 1) which is fastened to block 3. The free end of rod 10 has a loop 12 formed therein so as to surround crossbar 13

of a yoke arrangement which is connected by rods 14 and 15 to one end of a crosspiece 16 extending through cord 2 in fore and aft alignment with head 1. When arm 5 is moved down into the position shown in dotted lines, Fig. 3, shaft 7 is turned and the elements connected to it operate to tilt the doll's head into the position shown in dotted lines. As soon as arm 5 is released, the head will be returned to normal position because of the resiliency of rubber cord 2. As will be referred to below, another reason for using cord 2 and the yoke arrangement is that the head may also be turned or tilted sideways without having these different movements interfere with one another.

Head 1 may be turned from right to left and vice versa in the following manner: Left arm 17 is connected to one end of a shaft 18 similar to shaft 7 connected to right arm 5. A flexible wire cable 19 is suitably fastened at one end to shaft 18 and is curved up through cutout 3' (Fig. 1) to the top of block 3 where it is embedded axially of the rubber cord 2 (Fig. 3). When arm 17 is pushed down in the direction indicated by the arrow, Fig. 4, cable 19 is twisted as shaft 18 turns and this twisting motion is immediately transmitted to the cable's other end which turns head 1 of the doll to the left. When arm 17 is raised the head will be turned in the opposite direction. Figs. 3 and 4 show that the elements controlling the nodding or forward tilting of the head will not be disturbed by the turning movement because crosspiece 13 is free to pass through loop 12.

Head 1 and stuffing 1' are held in place by strings fastened to the yoke arrangement. Strings 26 and 27 are respectively fastened to opposite ends of crosspieces 16 and 36. These strings pass around the outside surface of the stuffing. String 39 is fastened to opposite ends of crosspiece 36 and passed through stuffing 1' and head 1 and tied in a knot 39' on top of the head. This knot may be conveniently concealed by hair or a hat (not shown).

I have found that a certain type of cable similar to Bowden wire and comprising at least two servings of oppositely directed helically wound wire surrounding a core of straight wire strands, commonly used in radio receivers to connect apparatus such as tuning knobs or levers with movable elements, is particularly suited for cable 19. The outstanding characteristic of this cable is that when one end of the cable is turned a corresponding turning movement is immediately repeated at the other end and this is so even though one end of the cable may be deflected 90° more with respect to the other end.

Two knobs 20 and 21 (Figs. 2 and 3) project from the rear of body portion 4 of the doll. The knobs are respectively mounted on shafts 22, 23 extending through supporting block 3. Knob 20 controls the clapping motion of the arms and knob 21 the shaking or side sway tilt of the head.

Shaft 22 of knob 20 is fastened by a screw 24 to a movable member 25 centrally mounted on the front of supporting block 3. Rubber segments 28 and 29 respectively, connect opposite ends of member 25 to arms 5 and 17. As best seen in Fig. 7 one end of segment 29 is fastened to the inside of arm 17 at 30 and the other end to member 25. When knob 20 is turned back and forth as indicated by the arrows, Fig. 6, member 25 is swung from its normal horizontal position towards the vertical and in so doing segments 28 and 29 pull arms 5 and 17 towards one another as shown in dotted lines, Figs. 5 and 6. When the knob is turned in the opposite direction the segments push the arms away from one another. By turning knob 20 back and forth rapidly a clapping motion is made with the hands of the doll. By providing sutable joints at the wrists and elbows of the arms this motion may be given added realism. Because segments 28, 29 are elastic they are able to control the clapping movement without interfering with the up and down movement of the arms used to turn and tilt the head forward.

Knob 21 which controls the shaking or side tilt of head 1 is mounted along with crossbar 31 on shaft 23. Wires 32 and 33 are fastened to either end of bar 31 and pass up through supporting block 3 and are respectively connected to two rubber strips 34, 35 which are in turn connected to crosspiece 36 that passes through cord 2 at right angles to crosspiece 16. As best seen in Fig. 8, when knob 21 is turned back and forth in the direction indicated by the arrows, head 1 will be alternately tilted from one side to the other as shown in dotted lines. Rubber strips 34, 35 similar to segments 28, 29 provide resilient and flexible connections in the means for swaying the head from side to side so that the nodding and turning movements imparted to the head by the arms are not interfered with.

Shoulders 37, 38 (Fig. 2) may be suitably attached to block 3 and provide supporting means for the clothes and body stuffing (not shown) as well as keeping the latter out of the moving parts connected to the arms. This is particularly necessary when the unit is inserted in a soft exterior doll. The shoulders are not necessary when the unit is enclosed in a doll having a hard exterior.

Figs. 9–14 show an embodiment of my doll in which the movement of cord 2 is accomplished by pressure plates rather than crosspieces extending through the cord. The operation and movement of the arms and knobs is the same as above described and will not be repeated.

The shaking or side sway of head 1 (Figs. 9–11) is accomplished in the following manner: On either side of cord 2, approximately at the points where crosspiece 36 passed through in the previously described embodiment, pressure plates 40 and 41 which are shaped to conform to the contour of the cord are supported by legs 42, 43. These legs are secured to two cylinders 44 each rotatable about its shaft 45, which is secured to opposite sides of block 3 by a pin 46. Washers 47 hold shafts 45 away from the surface of the supporting block and permit cylinders 44 to turn freely. Horizontal rods 48, 49 extend from the backs of pressure plates 40, 41 and the rods' free ends are connected to rubber strips 34, 35 in the same manner as is crosspiece 36 (Fig. 8). Therefore, when knob 21 is operated pressure plates 40, 41 are pivoted about shafts 45 and press against cord 2 tilting it to the left or right, depending in which direction knob 21 is turned. As seen from Fig. 11 when rubber strip 34 is pulled down plate 41 will push the upper portion of the cord to the left. When strip 35 is pulled down plate 40 tilts the cord to the right.

The nodding motion or forward tilt is imparted to the doll's head by means of a pressure plate 50 mounted in the back of cord 2 at the point where crosspiece 16 passed through in the previously described embodiment. Plate 50 is pivotally supported, similar to plates 40, 41, on legs 51, 52 fastened to rotatable cylinders 54. A semi-

circular ring 56 is also fastened to cylinders 54 and a wire 57 with a loop 58 is connected to the front of the ring similar to wire 9 shown in Fig. 3. Link 8 is connected to wire 57 and arm 5 as shown in Fig. 3. When arm 5 is moved down, plate 52 through the mechanism just explained, presses against the cord and tilts it forward and downwardly as indicated by the arrow and dotted lines Fig. 13.

The pressure plates just described may be substituted in the embodiment first described for the crosspiece passing through the cord to control side tilting of the head, or for the crosspiece controlling forward tilting of the head, or may, as shown in Fig. 14, be substituted for both these crosspieces to control both movements of the head.

Although all the enumerated movements of the head and arms are carried out by separate means and these means are connected to one another, they are free to operate independently and do not interfere with one another because of the flexible connections, and the sliding mechanism for tilting the head as pointed out in the drawings and the related descriptions.

From the above, it will be apparent that my doll will be inexpensive and easy to manufacture because the parts are easily obtained, cheap and need no careful fitting when being assembled. The parts may comprise stampings which are soldered or riveted to one another.

While I have shown and described preferred embodiments of my invention it is to be understood that the foregoing will suggest other modifications to those skilled in the art and I intend to limit myself only by what is set forth in the appended claims.

What is claimed is:

1. A doll comprising a body, a head movable into at least three different positions, flexible rubber supporting means for the head, two arms extending from the body, each of said arms connected respectively to one end of two rotatable shafts, a flexible cable connecting the other end of one of said shafts to the rubber supporting means whereby the head is turned when one of said arms is moved up and down, a rod connecting the free end of said other shaft and said supporting means whereby the head is tilted forward when said other arm is moved down, a mounting connected to said rubber supporting means, a first knob projecting from the body, a crossbar connected to said knob, rubber strips connected between the free ends of said crossbar and opposite sides of said supporting means whereby the head is swayed from side to side when the knob is turned back and forth, a second knob projecting from the body, a member pivotally mounted on said mounting means, and rubber segments connected between the free ends of said member and each of said arms whereby the arms are moved towards and away from one another when said knob is turned back and forth.

2. The device according to claim 1, and a pair of pivotally mounted plates adjacent two sides of said flexible rubber supporting means and connected to said rubber strips.

3. A doll comprising a body, a head including a face mounted in normal erect position on the body and movable into different positions, a supporting structure insertable within the doll's body, a flexible rubber cord projecting from said structure, said head mounted on one end of said cord, two arms extending from the body, a pivotal connection between each of said arms and said supporting structure, a first horizontal crosspiece passing through said core in fore and aft alignment with the doll's face, a wire and rod connection between a first arm and the front end of said crosspiece whereby when the arm is moved down the head is tilted forward, a shaft extending from the second arm, a flexible wire cable having one end fastened to said shaft and the other end to the free end of the cord whereby when said arm is moved up and down the doll's head is turned from one side to the other, a second horizontal crosspiece passing through said core at right angles to the first crosspiece, two operating knobs mounted on said supporting structure and extending through the body of the doll, two strips of rubber respectively fastened to either end of said second crosspiece, connections from one of said knobs to said rubber strips whereby when the knob is turned back and forth the head is tilted from one side to the other, a movable member mounted on the side of said supporting structure opposite from that of the second knob and connected at its center to the knob, and two rubber segments respectively connecting the ends of said member to each of the arms whereby when the second knob is turned back and forth the arms are moved towards and away from one another.

4. A doll comprising a body, a head mounted in normal position on the body and movable into different positions, a supporting structure insertable within the doll's body, a flexible rubber cord projecting from said structure with the head mounted on one end thereof, two arms extending from the body and pivotally connected to said structure, a pressure plate mounted adjacent the cord just below the back of said head, two legs fastened to pivoting means on said supporting structure and supporting said plate, a semi-circular rod fastened to said pivoting means, connecting means between a first arm and the front of said semi-circular rod whereby when the arm is moved down the head is tilted forward, connecting means between the second arm and said rubber cord, a flexible wire cable included in said last mentioned means, one end of said cable fastened to said second arm and the other end to the free end of the cord whereby when said arm is moved up and down the doll's head is turned from one side to the other, a pair of pressure plates mounted adjacent the cord on either side of the head, supporting legs fastened to pivoting means on said supporting structure and supporting said plates, a horizontal rod extending from back of each of said pressure plates, two operating knobs mounted on said supporting structure and extending through the body of the doll, two strips of rubber respectively fastened to either free end of said horizontal rods, connections from one of said knobs to said rubber strips whereby when the knob is turned back and forth the head is tilted from one side to the other, a movable member mounted on the side of said supporting structure opposite from that of the second knob and connected at its center to the knob, and two rubber segments respectively connecting the ends of said member to each of the arms whereby when the second knob is turned back and forth the arms are moved towards and away from one another.

5. A doll comprising a body, a movable head, a supporting structure disposed within the said body, a resilient member mounting said head on said structure, two arms pivotally connected to the body, a pivotally mounted plate adjacent a

portion of said resilient member, legs extending from said plate and connected to pivoting means on said supporting structure, a rod fastened to said pivoting means, a wire and link connection between one of said arms and said rod whereby when said one arm is moved down the plate bears against the resilient member whereby the head is tilted forward, a knob projecting from the body, a pair of pivotally mounted plates adjacent two sides of said resilient member, a rod extending from the back of each of said plates, and means including two rubber strips fastened to the free ends of said rods to connect said knob to said last mentioned plates whereby turning of the knob will cause the head to sway from side to side.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
624,799	Haveis	May 9, 1899
1,332,732	Lizzi	Mar. 2, 1920
1,608,134	Michel	Nov. 23, 1926
1,788,671	Heideklang	Jan. 13, 1931
1,819,475	Morley	Aug. 18, 1931
1,872,544	Williams	Aug. 16, 1932
2,137,371	Marsh	Nov. 22, 1938
2,288,371	Rothschild	June 30, 1942