March 2, 1954 W. K. WALSS 2,670,568

EYE MOVEMENT FOR DOLLS AND THE LIKE

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FIG. 1.

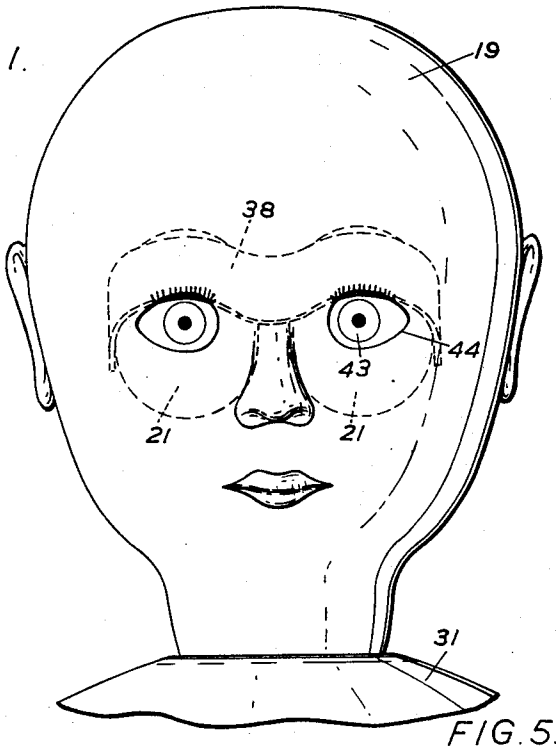

FIG. 5.

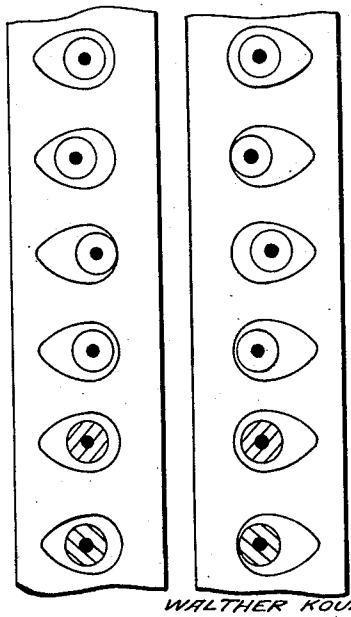

FIG. 4.

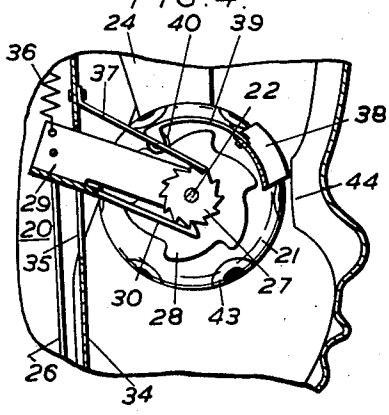

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FIG. 2.

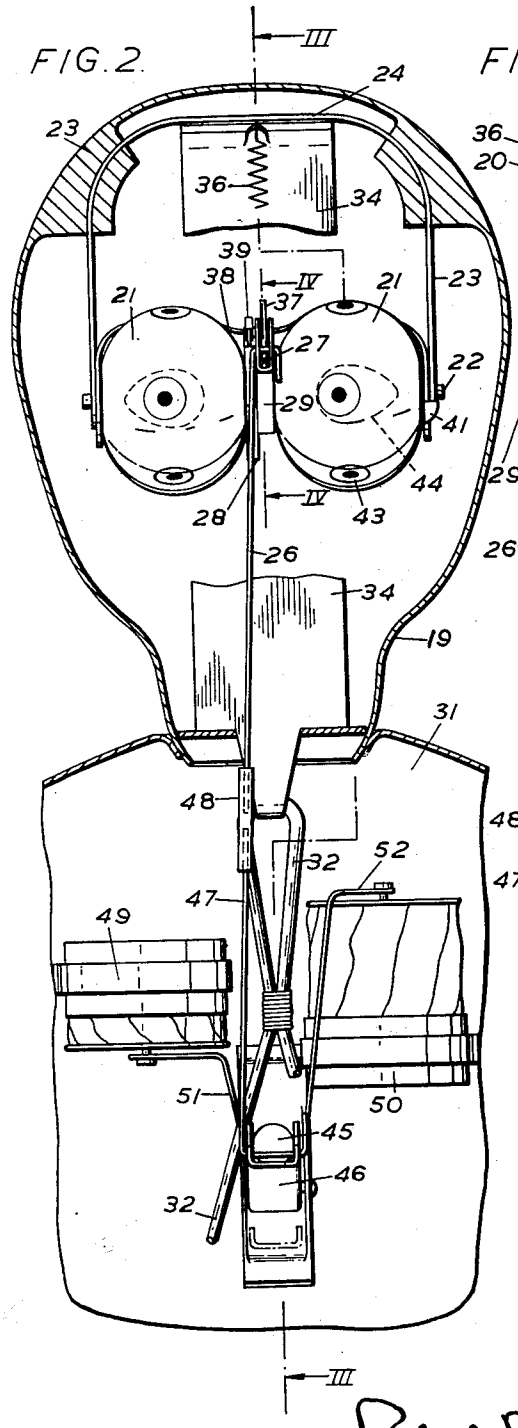
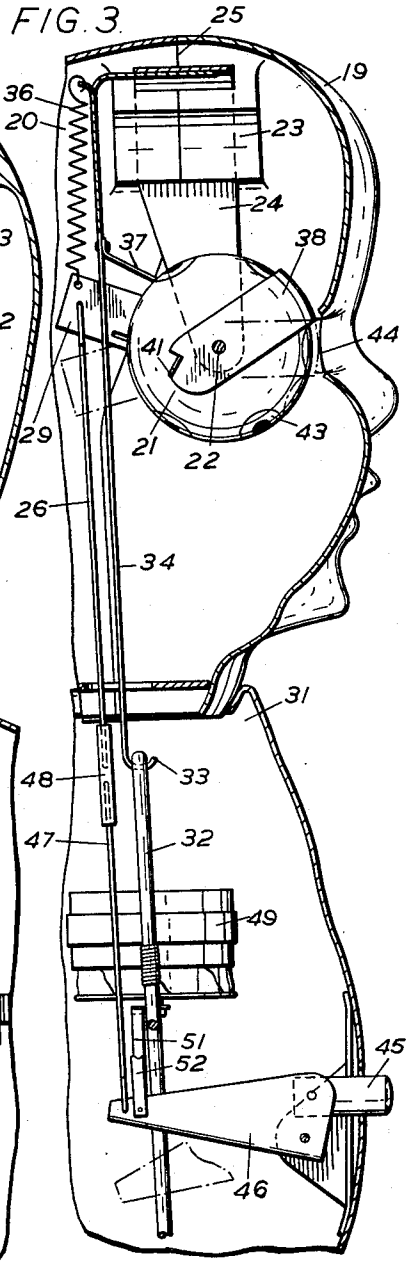


FIG. 3.



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EYE MOVEMENT FOR DOLLS AND THE LIKE

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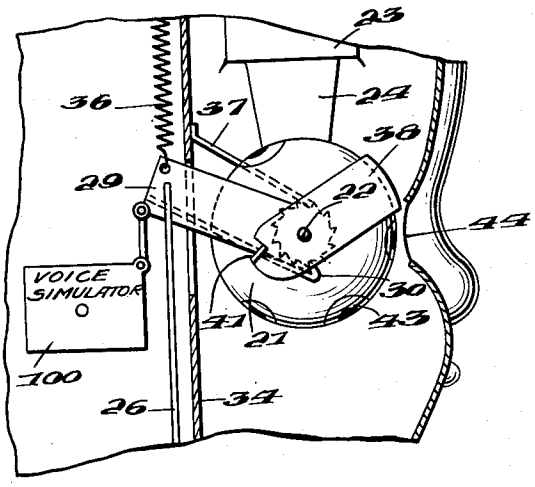

Fig. 6.

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EYE MOVEMENT FOR DOLLS AND THE LIKE

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12 Claims. (Cl. 46—118)

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This invention relates primarily to dolls having movable eyes of the kind in which either a single eye member or two eye members has or have more than one pair of irises, different pairs of irises being moved into registry with eye sockets to give the face different expressions. The invention is also applicable to similar figures used for advertising purposes or as toys such as, for example, toy animals.

In figures of the kind referred to, the movement of the eye members is commonly brought about by a weight swinging within the doll and is thus dependent upon the attitude of the doll. Thus, for example, the changing of the irises may be brought about by moving the doll from a sitting to a lying position and back again.

It is an object of the present invention to provide a figure with eyelids which will remain in an open or closed position independently of the attitude of the figure.

It is another object of this invention to provide a novel eye actuating mechanism for a doll whereby attractive effects are produced when the doll is moved.

It is a further object to associate the eyelids with eye members with a plurality of irises and to provide manually operable mechanism for the eyelids and eye members.

Further objects and features of the invention will appear from the following description of a preferred embodiment of the invention read in conjunction with the accompanying drawings in which:

Figure 1 is a front elevation of the head of a doll;

Figure 2 is a rear elevation of the head and part of the body of the doll, the rear wall being broken away;

Figure 3 is a section on the line III—III in Figure 2;

Figure 4 is a section on the line IV—IV in Figure 2;

Figure 5 is a diagram of the arrangement of the irises; and

Figure 6 is also a section on the line IV—IV in Figure 2 showing an alternative form of the invention.

The head of the doll shown is in two halves 19 and 20 assembled on a line 25. A U-shaped bracket 24 is secured in slots in blocks 23 inside the head and two eye members 21 are carried by a shaft 22 journalled in the arms of the bracket 24. Each eye member 21 carries six irises 43 arranged as indicated in Figure 5 so that by rotation of the shaft 22 the doll may be given a number of alternative expressions both by changes in the direction in which it is looking and in the color of its eyes. Between the two eye members, as shown in Figure 4, are a ratchet wheel 27 and a toothed wheel 28, both secured to the shaft 22. A channel-sectioned operating lever 29 is pivoted on the shaft 22, its two flanges lying on either side of the ratchet wheel 27. Towards the ratchet wheel 27 the web of the channel is separated from the flanges and acts as a pawl 30 engaging the ratchet wheel.

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The head is held to the body 31 of the doll by elastic 32 which is looped over a hook 33 on the end of a strip 34 secured to the U-shaped bracket 24. The operating lever 29 passes through a slot 35 by which its travel is limited and is normally held in the upper position, shown, by a spring 36.

When desired, the operating lever 29 is moved downwards by a link 26 and as it does so, the pawl 30 rides over one tooth on the ratchet wheel 27 and so when the operating lever is returned by the spring 36 the shaft 22 is turned through 30°. It is then held in this position by a second pawl 37.

A strip 38 is bent to form eyelids and is journalled at its ends on the shaft 22. As its centre the strip 38 carries a resilient arm 39 having on its end a roller 40 which rides on the toothed wheel 28. There are only half as many teeth on the wheel 28 as on the wheel 27 and they are so shaped that as the shaft 22 is turned clockwise, as seen in Figures 3 and 4, to move a pair of irises 43 out of registry with eye sockets 44, the eyelids 38 are moved to a closed position. Movement of the eyelids past the closed position is prevented, however, by engagement of a lug 41 with one arm of the bracket 24. Upon the next rotation through 30° of the shaft 22 to bring fresh irises 43 into registry with the eye sockets 44 the roller 40 rides over the top of a tooth on the wheel 28 and then runs down the far side so that the eyelids 38 are rotated anti-clockwise through about 30° to an open position. Thus, upon each complete reciprocation of the link 26, the eyelids are alternately opened and closed, being open when the irises 43 are opposite the sockets 44 and closed when the eye members 21 are in an intermediate position.

The link 26 is reciprocated by a press-button 45 in the body of the doll. This button has a short travel and moves a bell-crank lever 46 to which is pivoted a link 47 which is joined end to end to the link 26 by a piece of rubber tubing 48. This joint allows the head and body of the doll to be separately assembled and then connected together. Reciprocation of the button 45 serves

also to operate two voice devices 49 and 50 in the body of the doll, one being arranged to sound as the button is pressed and the other when the button is released. The pushing in and releasing of the button constitutes one cycle of the operation of the button. The moving ends of the bellows of these devices are connected to the bell-crank 46 by links 51 and 52.

It will be seen that in the doll described the parts of the eye members lying between adjacent irises are concealed by the eyelids during movement of the eye members and thus it is not immediately apparent how the change of the irises is brought about. Moreover the irises can be changed and the eyelids left either open or shut at will regardless of the attitude of the doll. Furthermore by light pressure on the button 45 it is possible to sound the voice devices without rotating the shaft 22.

In the doll shown pressure on the button 45 moves the lever 29 downwards, the links 25 and 47 being under tension. Alternatively the bell-crank lever 46 may be modified so that pressure on the button 45 moves the lever 29 upwards.

It will be noted that the entire eye mechanism can be assembled within the U-shaped bracket 24 before insertion in the head.

It is a feature of the present invention that the provision of the eye operating mechanism does not interfere with turning of the head of a doll. If extreme freedom of turning is desired, a swivel may be inserted in the links 25 and 47.

Although in the examples described in detail the eye mechanism is connected to a push button, it may be connected to some other movable member. For example swinging the arm of a doll may serve to reciprocate a link connected to the eye mechanism.

Figure 6 shows an alternative form of the operating mechanism. As shown in that fragmentary view, the two flanges of the operating lever 29 can be on either end of the shaft 22 surrounding the eyeballs. The operating lever 29 carries pawl 30 centrally of lever 29, engaging the ratchet wheel 27. This arrangement has the obvious advantages of ease of assembling from the manufacturer's point of view.

Figure 6 also shows means for attaching a voice simulating mechanism 100, indicated diagrammatically in the figure, for operation by lever 29.

I claim:

1. In a figure, means forming an eye socket, a horizontal rotary shaft behind said eye socket, an eyeball member having a plurality of irises spaced around the periphery thereof, said member being fixed on said shaft, an eyelid member pivoted on said shaft, a cam wheel rigid on said shaft and formed with a plurality of uniformly pitched projections equal in number to said irises, means for turning said shaft repeatedly through half the pitch of said projections, a resilient arm carried by said eyelid member and co-operating with said cam wheel to urge said eyelid member across said eye socket, said cam wheel being formed to close said eyelid upon movement of said cam wheel one half pitch, and to open said eyelid at the end of the second half pitch, and a stop limiting movement of said eyelid member across said eye socket.

2. A figure having a head with two eye sockets formed therein, a transverse shaft journalled for rotation in said head behind said eye sockets, two eye members rigid on said shaft and each bearing a plurality of irises, an eyelid member movable between said eye members and said eye sockets by rotation about said shaft, a lever disposed between said eye members and pivoted on said shaft, manually operable means for swinging said lever through an arc, a ratchet wheel adjacent said lever and rigid with said shaft, and having twice as many teeth as the number of irises on each of said eye members, a pawl carried by said lever and co-operating with said ratchet wheel to turn said shaft in a direction to move the irises adjacent said eye sockets downwards, a cam wheel rigid on said shaft and formed with as many projections as said number of irises, and a resilient arm carried by said eyelid member and co-operating with said cam wheel upon a first movement of said shaft to close said eyelids and at the end of the next succeeding movement of said shaft, to open said eyelids.

3. A figure having a head with two eye sockets formed therein, a transverse shaft journalled for rotation in said head behind said eye sockets, two eye members rigid on said shaft and each bearing a plurality of irises, an eyelid member movable between said eye members and said eye sockets by rotation about said shaft, a lever having flange members disposed on either side of said eye members and pivoted on said shaft, manually operable means for swinging said lever through an arc, a ratchet wheel rigid with said shaft, and having twice as many teeth as the number of irises on each of said eye members, a pawl carried by said lever and co-operating with said ratchet wheel to turn said shaft in a direction to move the irises adjacent said eye sockets downwards, a cam wheel rigid on said shaft and formed with as many projections as said number of irises, and a resilient arm carried by said eyelid member and co-operating with said cam wheel upon a first movement of said shaft to close said eyelids and at the end of the next succeeding movement of said shaft, to open said eyelids.

4. A figure according to claim 3, further comprising, a voice device, and means connecting said device to said manually operable means for operation thereby.

5. A figure having a head with two eye sockets formed therein, a transverse shaft journalled for rotation in said head behind said eye sockets, two eye members rigid on said shaft and each bearing a plurality of irises, an eyelid member movable between said eye members and said eye sockets by rotation about said shaft, manually operable mechanism, and means connecting said shaft to said mechanism to rotate said eye members to complete a single change from one set of irises to another set of irises during first and second cycles of operation of said mechanism, and means connecting said eyelids to said shaft, whereby the opening and closing of said eyelids will be dependent upon the rotation of said shaft through two cycles, and the eyelids will be closed at the end of the first cycle of operation and opened at the end of the second cycle of operation.

6. A figure according to claim 5, in which said mechanism includes a manually depressible and returnable button, said cycles of operation each including the depressing and returning of said button.

7. In a figure, a head formed with an eye socket, a rotatable eyeball having around a circumference thereof a plurality of irises, said eyeball being mounted to rotate said irises only in one direction successively to be visible through said socket, an eyelid, means for moving said eyelid up and down to open and close said socket, and

means mechanically coordinated with said eyelid moving means for rotating said eyeball in said one direction while the eyelids remain closed.

8. In a figure, a head formed with an eye socket, a rotatable eye member having a plurality of irises, an eyelid, a manually operable mechanism having first and second movements to complete a cycle, means connecting said eyelid to said mechanism to close said eyelid during a first cycle and to open said eyelid on the second movement of the next succeeding cycle, and means connecting said member to said mechanism to rotate said member a first portion of the pitch of said irises during said first cycle, and to rotate said member the remaining portion of said pitch during said next succeeding cycle, before said eyelid opens, whereby the change of irises is concealed.

9. A figure according to claim 8, in which each iris extends at least to the top and bottom of said socket.

10. In a figure, a head formed with an eye socket, a movable eye member having a plurality of irises, said eye member being mounted on a shaft journalled in said head, an eyelid mounted for opening and closing said socket, manually operable mechanism, means connected to said mechanism for moving said eye member while said eyelid remains closed, said last named means

comprising, means connecting said manually operable mechanism to said shaft to rotate said shaft in only one direction with every cycle of operation of said mechanism and thereby to move said irises successively to be visible through said socket, and means connecting said eyelid to said shaft, whereby the opening and closing of said eyelid is dependent upon the rotation of said shaft.

11. A figure according to claim 10, in which said eyelid is closed during a first cycle of operation of said mechanism, and opened during the second cycle of operation after said irises have been shifted to position opposite the eyesockets.

12. A figure according to claim 10, in which said last named means comprises a cam fixed to said shaft, and a resilient cam follower connecting said eyelid to said cam.

WALTHER KOURT WALSS.

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