Oct. 15, 1929. S. TADAKUMA 1,732,197

AUTOMATON DOLL

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Fig.1.

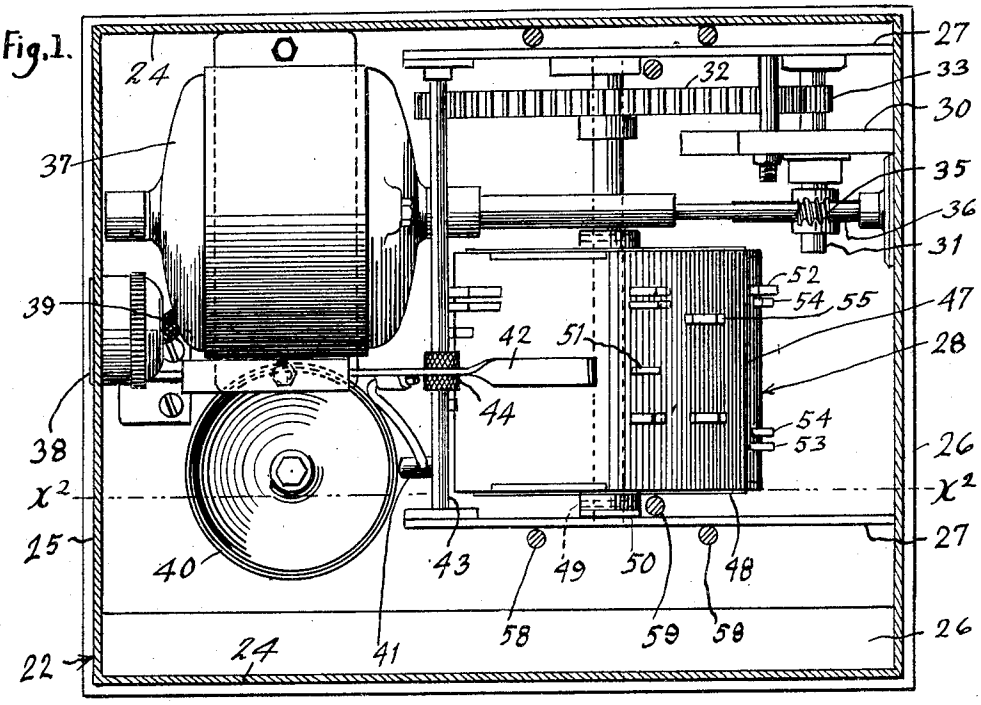
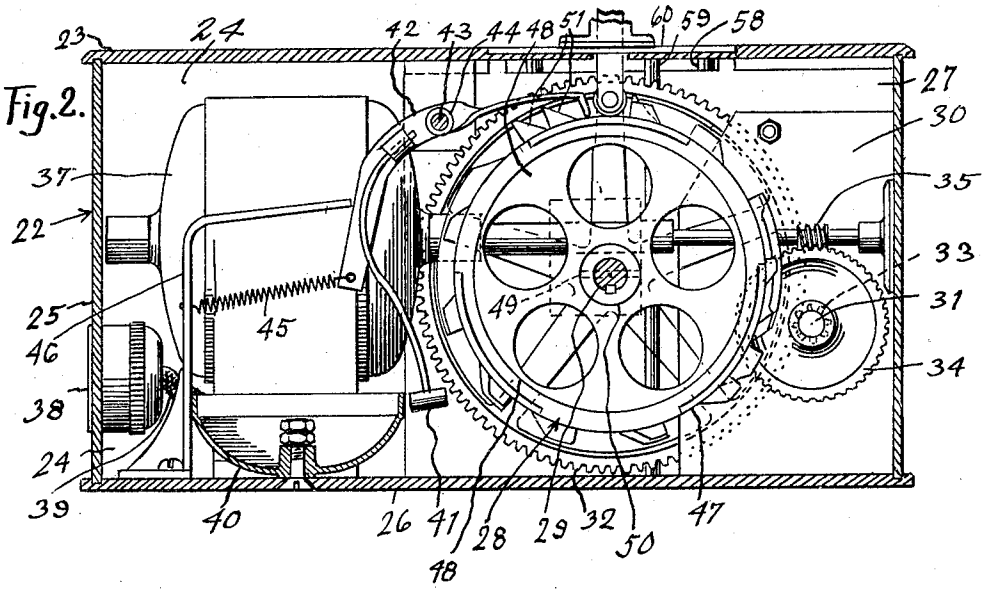


Fig.2.



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Oct. 15, 1929. S. TADAKUMA 1,732,197

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Fig. 3.

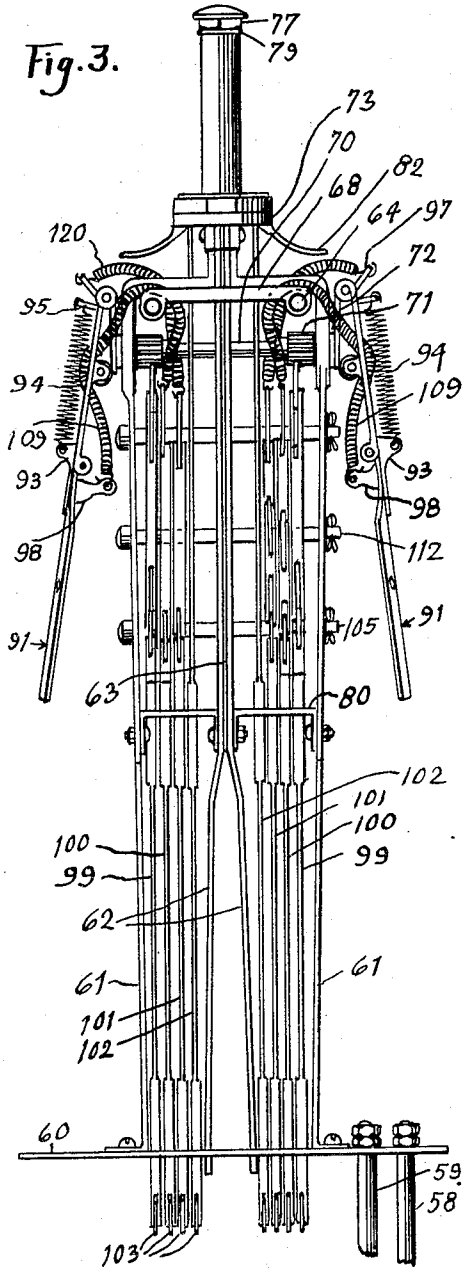


Fig. 5.

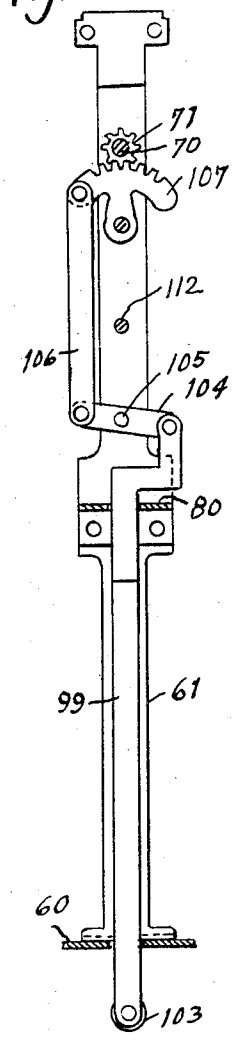
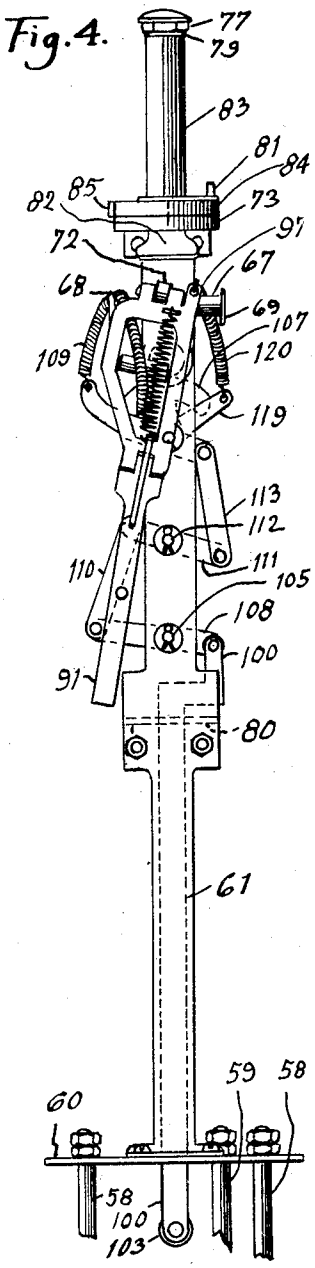


Fig. 4.



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Oct. 15, 1929. S. TADAKUMA 1,732,197

AUTOMATON DOLL

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Fig. 6.

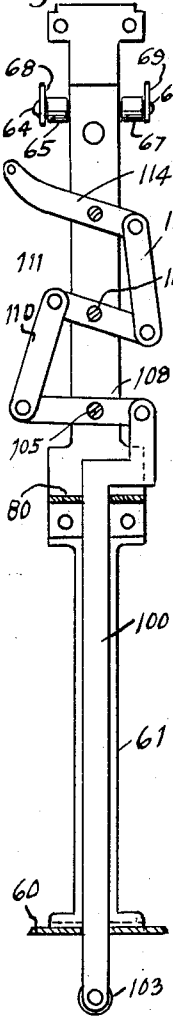


Fig. 7.

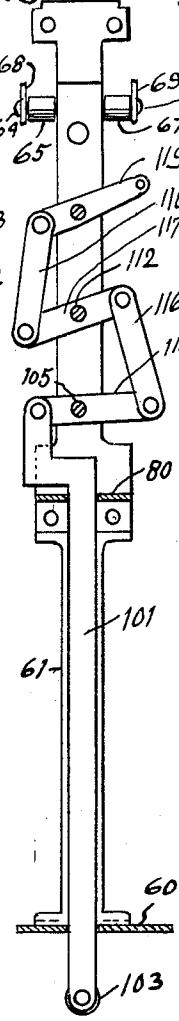


Fig. 8

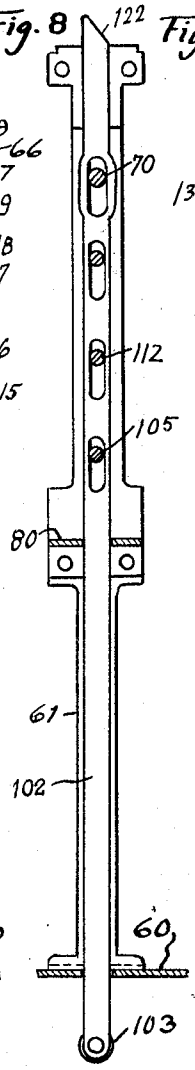


Fig. 15.

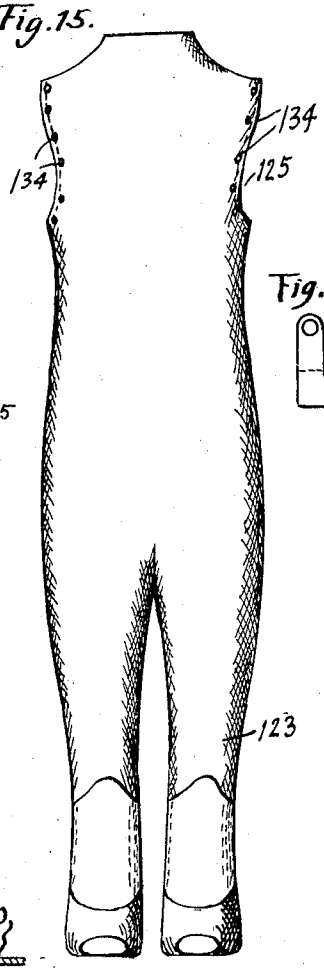


Fig. 16.



Fig. 17.

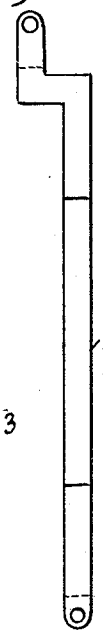


Fig. 18.

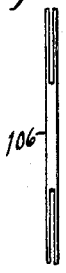


Fig. 9

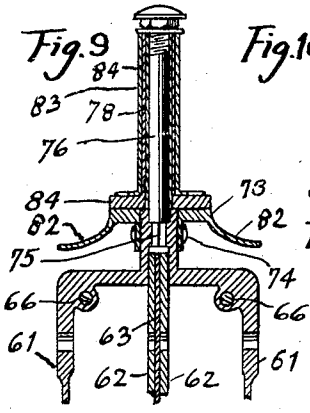


Fig. 10.

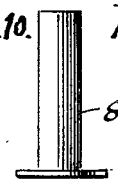


Fig. 11.



Fig. 12.



Fig. 13.

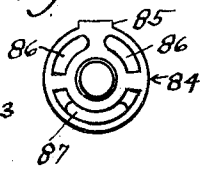
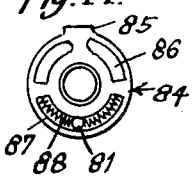


Fig. 14.



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Oct. 15, 1929. S. TADAKUMA 1,732,197

AUTOMATON DOLL

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Fig.19.

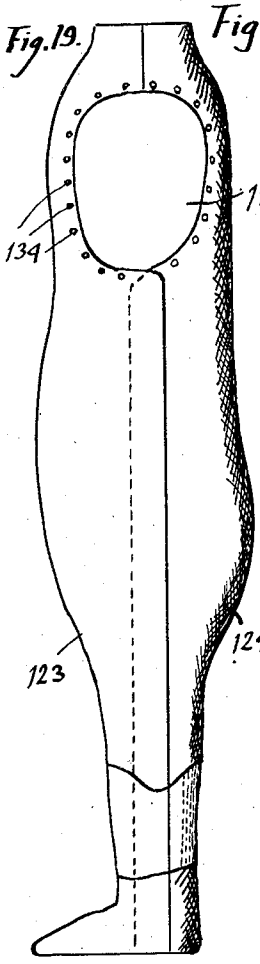


Fig.20.

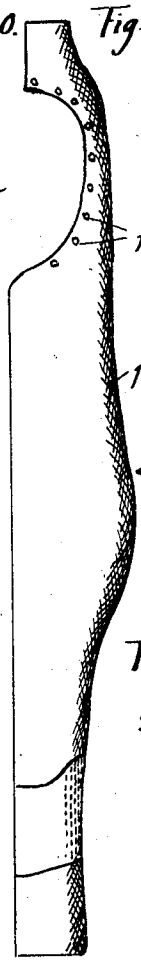


Fig.21

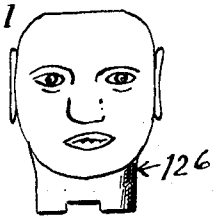


Fig.27.

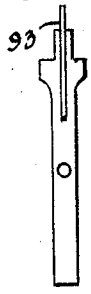


Fig.28.

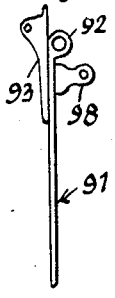


Fig.29.

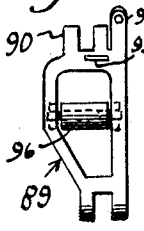


Fig.30.

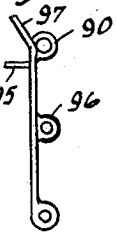


Fig.22.

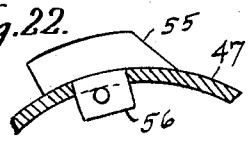


Fig.23.

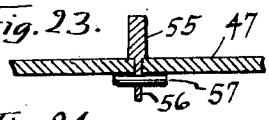


Fig.24.

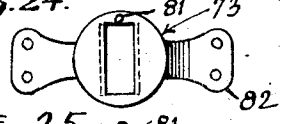


Fig.25.

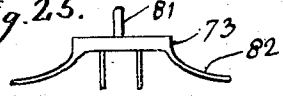


Fig.26.

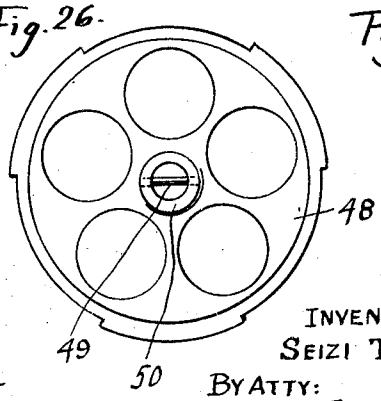
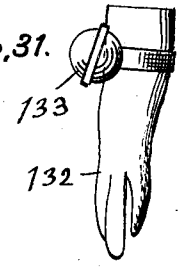


Fig.31.



INVENTOR:
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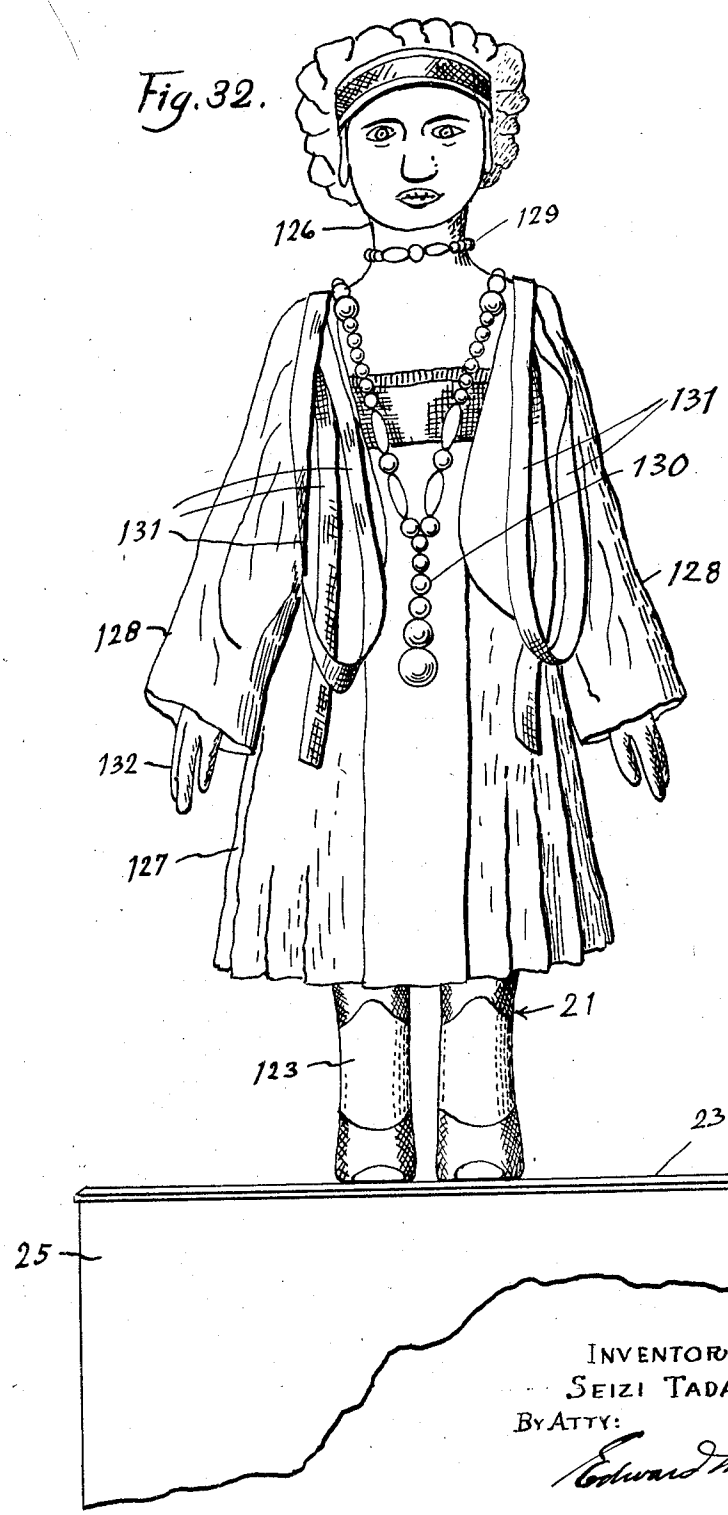
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AUTOMATON DOLL

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Fig. 32.



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Patented Oct. 15, 1929 1,732,197

UNITED STATES PATENT OFFICE

SEIZI TADAKUMA, OF LOS ANGELES, CALIFORNIA

AUTOMATON DOLL

Application filed January 14, 1928. Serial No. 246,857.

This invention has reference to an improved automaton device, and the objects of the invention are to provide a figure resembling a human being, and so constructed that it will make movements like those of life for certain periods depending on the actuating means employed; the device being fashioned in the form of a doll, and, in the present instance, being actuated by electro-motive means.

Another object is to provide an improved advertising device of the character herein described.

In the embodiment of the device as illustrated, I employ a figure capable of performing certain rhythmic movements which are accompanied by the ringing of a bell and other suitable sound-producing devices, and electro-motive means for actuating the same. The figure is mounted on a box containing the electro-motive elements, and is capable of performing arm and neck movements.

Other objects and advantages following the use of the invention herein disclosed will appear as the description of the structure and manner of operation proceeds.

A practical embodiment of the invention is illustrated in the accompanying drawings, in which:

In the drawings, Figure 1 is a sectional and plan view of the supporting box for my improved automaton doll, showing the motor and a portion of the actuating mechanism. Fig. 2 is a longitudinal and sectional view of the supporting box, taken generally on line X^2—X^2, of Fig. 1. Fig. 3 is a front elevation of the automaton frame and actuating mechanism. Fig. 4 is a side elevation of the automaton frame and actuating mechanism. Fig. 5 is a diagram showing the actuating mechanism adapted for one movement of the automaton. Fig. 6 is a diagram showing the actuating mechanism for folding movement of the lower arm members. Fig. 7 is a diagram showing the mechanism for actuating the arms with an outward and upward movement. Fig. 8 is a diagram showing the mechanism for actuating the head with a turning movement. Fig. 9 is a fragmentary and sectional view showing the elements for actuating the head. Fig. 10 is a detail view of the retaining member for the retracting springs that actuate the head to normal position. Fig. 11 is another detail view of the retaining member. Fig. 12 is a top plan view of the retaining member. Fig. 13 is a top plan view of the turning member which is adapted to actuate the head. Fig. 14 is another top plan view of the turning member showing the retracting springs in position. Fig. 15 is a front elevation of the body portion of the doll showing the pressed paper form. Fig. 16 is a front and detail view of an actuating plunger. Fig. 17 is a side and detail view of the actuating plunger shown in Fig. 16. Fig. 18 is a front and detail view of one of the actuating links. Fig. 19 is a side elevation of the pressed form comprising the body portion of the doll. Fig. 20 is a side elevation of one portion of the doll form shown in Fig. 19. Fig. 21 is a front elevation of the head portion of the doll. Fig. 22 is a fragmentary and detail view showing the method of attaching the cams to the actuating drum. Fig. 23 is a fragmentary and detail view showing a cam in section attached to the actuating drum. Fig. 24 is a top plan view of the fixed collar forming a portion of the frame for the automaton actuating elements. Fig. 25 is a side elevation of the collar shown in Fig. 24. Fig. 26 is a side elevation of an end supporting member for the actuating drum. Fig. 27 is a detail view of a lower arm automaton actuating member. Fig. 28 is a detail view of a lower arm automaton member. Fig. 29 is a detail view of an upper arm automaton member. Fig. 30 is a detail side view of an upper arm automaton member. Fig. 31 is a detail view of a hand member, showing a bell attached thereto. Fig. 32 is a front elevation showing the doll mounted on the supporting box, and showing the doll complete with a garment thereon.

The number of movements and the various positions assumed by the automaton figure, are not shown in the drawings, but they are dependent on and in accordance with the number, position, length and contour of the actuating cams, and on the length of certain

levers and links that are illustrated in the diagrammatic views.

The drawings illustrate the device as being driven by means of an electric motor, but it is to be understood that other motors, such as a spring motor, may be considered the equivalent thereof.

Referring to the drawings, the automaton device embodying the features of my invention consists of the figure or doll 21, which is mounted on a supporting box 22.

The supporting box 22, consists of a top 23, the side walls 24, the front wall 25, and the base 26. Within the box, I provide supporting standards 27, in which the operating drum 28 and shaft 29 are journalled, and the standard 30, in which the worm-gear shaft 31 is journalled. A spur-gear wheel 32 is mounted on the drum-shaft 29, and a pinion 33, in mesh with gear wheel 32, is mounted on shaft 31. A worm-gear 34, is mounted on shaft 31, and meshes with the worm 35, on electric-motor shaft 36, which is driven by the electric motor 37. An electric socket 38 is mounted in front wall 25, and is connected by electric wire conduits 39, with motor 37. Within the box, I provide a bell 40, adapted to be struck by a hammer 41, which is fixed to a lever 42 pivotally mounted on shaft 43, and positioned by the fixed collars 44. The shaft 43 extends between the supporting standards 27. A spring 45, connected to lever 42, and an abutment member 46, serves to actuate the lever and retract the same to normal position against abutment member 46.

The operating drum 28, consists of a cylinder 47, having the end supporting members 48, which are fixed to shaft 29, being secured by pins 49, extending through the shaft and through hubs 50, of members 48. On the drum cylinder 47, I mount a plurality of actuating cams 51, for actuating bell lever 42, cams 52, 53 and 54, for arm movements of the figure, and cams 55, for neck movement of the figure. These cams may be varied in number, position and height to attain desired movements of the figure, and other functions. All cams have a lug 56, projecting on the inner side of the drum, each lug having a securing pin 57. Draw-bolts 58 and 59 extend upwardly from the base 26 to support the figure.

Doll 21 consists of a base plate 60, flush with top 23, and resting on supporting standards 27. Draw bolts 58 and 59 engage with plate 60. A frame consisting of side frame members 61, inner frame members 62, and a central frame member 63, is fixed to base plate 60 and extends upwardly therefrom. Stud shafts 64 extending from the front of the frame, are provided with rollers 65, and stud shafts 66, projecting from the rear of the frame, are provided with rollers 67. Retaining members 68 and 69, respectively, are fixed to the stud shafts. Other shafts 70 are journalled in frame members 61 and 62; the central frame member 63, serving to space their inner extremities apart. Gear pinions 71 and lever arms 72, are fixed to shafts 70. Collar 73 is fixed to the upper ends of frame members 61, being secured by rivets or bolts 74. Frame members 61 have their upper ends formed to engage with the square section 75, of shaft 76, thereby holding the same rigidly. Shaft 76 has a screw nut 77 on its upper end, which serves to clamp the spacing sleeve 78 and washer 79, rigidly in position. Transverse braces 80, are disposed between the inner and outer frame members, and, together with the above-named elements form a rigid operative frame or standard. The collar 73 has a fixed pin 81 extending upwardly therefrom, and has shoulder brackets 82. An outer spacing and retaining member 83 is positioned between washer 79 and collar 73, being further retained in fixed position by pin 81.

A turning member 84, having thereon a lug 85, and having therein the cam slots 86, and an annular slot 87, is mounted on spacing sleeve 78, and between the outer retaining member 83, and member 73. The stop pin 81 extends through slot 87. Springs 88, disposed in slot 87, abut against the extremities of the slot and against stop pin 81, thereby serving to maintain the member 84 in normal position, with the lug 85 at the front.

Other movable parts forming the arms, consist of upper arm members 89, connected by hinge elements 90, with lever arms 72, and lower arm members 91, connected by hinge elements 92, with upper arm members 89. Projections 93, on lower arm members 91, engage with members 89, and thereby limit the outward swinging movement of the lower arm members. Relatively weak springs 94 are connected to projections 93 and to lugs 95 on the upper arm members 89, thereby serving to retract the lower arm members to their normal position. Members 89 are provided with rollers 96, and with lugs 97 adjacent to the upper hinge elements. The lower arm members have inwardly projecting lugs 98, opposite to projections 93.

Other movable parts for actuating the above described movable members, consist of plungers 99, 100, 101 and 102, sliding through base plate 60 and braces 80. These plungers each have a roller 103 on the lower end thereof, to engage with the actuating cams on drum 28. As shown in Fig. 5, the outer plungers 99, actuate levers 104, on pivot shaft 105. Through links 106, levers 104 actuate gear segments 107 which are in mesh with pinions 71, thereby, when the plungers are actuated by cams on drum 28, moving the arm elements upwardly and forwardly relative to the figure. As shown in Fig. 6, the plungers 100, through the medium of levers 108, on pivot shaft 105, and through links 110, levers 111 on pivot shaft 112, and links 113, actuate the movable lever arms 114. Through relatively

strong springs 109, connected to lever arms 114, and to projecting lugs 98 on the lower arm members 91, plungers 100 serve to actuate the lower arm members with an inward swinging movement. As shown in Fig. 7, the plungers 101, through levers 115, links 116, levers 117, and links 118, will actuate the lever arms 119. Through relatively strong springs 120, connected to lever arms 119 and to lugs 97, the upper arm members 89, are actuated with an outward and upward swinging movement. All arm movements are independent relative to one another, being in accordance with the size, number and arrangement of the operating cams.

As shown in Fig. 8, the plungers 102 sliding through the base plate 60, the braces 80, and fixed collar 73, have sliding cam extremities 122 projecting in cam slots 86 in turning member 84. As each plunger 102 moves upwardly, member 84 is actuated with a slight turning movement, and, when released, is retracted to normal position by springs 88.

Springs 109 pass over rollers 65 and 96, thereby actuating the parts with smooth and life-like movements, in accordance with the contour of the actuating cams. Similarly, the springs 120 pass over rollers 67.

Other parts of the figure or doll 21, consist of a body formed by the front portion 123, and rear portion 124, and encasing the moving parts, the body having openings 125 for the arms, and having the neck opening encasing the collar 73. The neck and head portion 126, is mounted on the turning member 84, and is actuated by the projection 85 on turning member 84. The body portion is covered by cloth fabric garments 127. The arm members are covered by cloth fabric sleeves 128. The neck portion is provided with beads 129. The body portion has the beads 130 and ribbon decorations 131. All of these cloth fabric elements assist in simulating smooth and life-like movements. The hand members 132 are adapted to be mounted on the lower arm members 91, and are provided with bells 133. For securing the parts together, and for securing the fabric garments to the pressed body form, I provide holes 134 therein. The body and head portions are preferably made of papier-mâché, but any suitable material may be considered the equivalent thereof. This is suitably fashioned and painted.

With the present invention, I provide a doll, automatically operated, and adapted to perform various smooth and lifelike movements, accompanied by the ringing of bells, all in rhythmic time.

From the foregoing description and drawings, it will be apparent that I have provided an automaton that will perform the various movements and functions set forth.

What is claimed is:

1. An automaton doll, comprising a formed body, a formed head independently movable relative to the body, hands independently movable relative to the body, actuating mechanism for the hands and head disposed within the body, retracting springs included in the said actuating mechanism, a supporting box for the body, plungers operatively connected relative to said actuating mechanism within the body and depending within the box, and means within the supporting box for intermittently actuating said plungers.

2. An automaton doll, comprising a formed body, a formed head independently movable relative to the body, hands independently movable relative to the body, mechanism within the body for actuating the head and hands, said mechanism including relatively weaker retracting springs, springs for retracting the head to its normal position, plungers operatively connected with the said actuating mechanism and depending from the body, other plungers for actuating the head extending through and depending from the body, a supporting box for the body, and means within the box for independently and intermittently actuating said plungers.

3. An automaton doll, comprising a formed body, a formed head independently movable relative to the body, hands independently movable relative to the body, operative mechanism for the head and hands disposed within the body, said mechanism being arranged for swinging and vertical movements, for swinging the hands in horizontal and vertical arcs of movement, for turning the hands, for moving the hands and forearms independently of the upper arm portions, levers composing a part of the said operative mechanism, springs of varying and different tension connecting the levers and the moving parts, some of said springs serving as actuating means and others as retracting means, plungers to actuate the levers, and a revoluble cam member to actuate the plungers.

4. An automaton doll, comprising a formed body, a formed head independently movable relative to the body, a swivel connection for the head, inclined cam members within the head, springs serving to maintain the head in its normal position, plungers extending through the body and terminating in the head, cams on the plungers engaging with said cam members to actuate the head in either direction, and a revoluble cam member to actuate said plungers, the said springs retracting the head to its normal position.

5. An automaton doll, comprising a formed body, a formed head independently movable relative to the body, hands independently movable relative to the body, forearms having a pivotal connection with the

hands, upper arms having a pivotal connection with the forearms, rotatable shoulder members, said upper arm members having a pivotal connection with the rotatable shoulder members, shafts on which the shoulder members are mounted, levers to actuate the arms, springs connecting the levers and certain of the arm members, some of the springs serving as actuators and others as retractors for said arm members, vertically movable plungers arranged to actuate said levers, and a revoluble cam member to actuate the plungers.

In testimony whereof, I hereunto affix my signature.

SEIZI TADAKUMA.