Nov. 30, 1954 A. G. ARDOLINO 2,695,472

WALKING AND TALKING DOLL MECHANISM

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Fig. 1

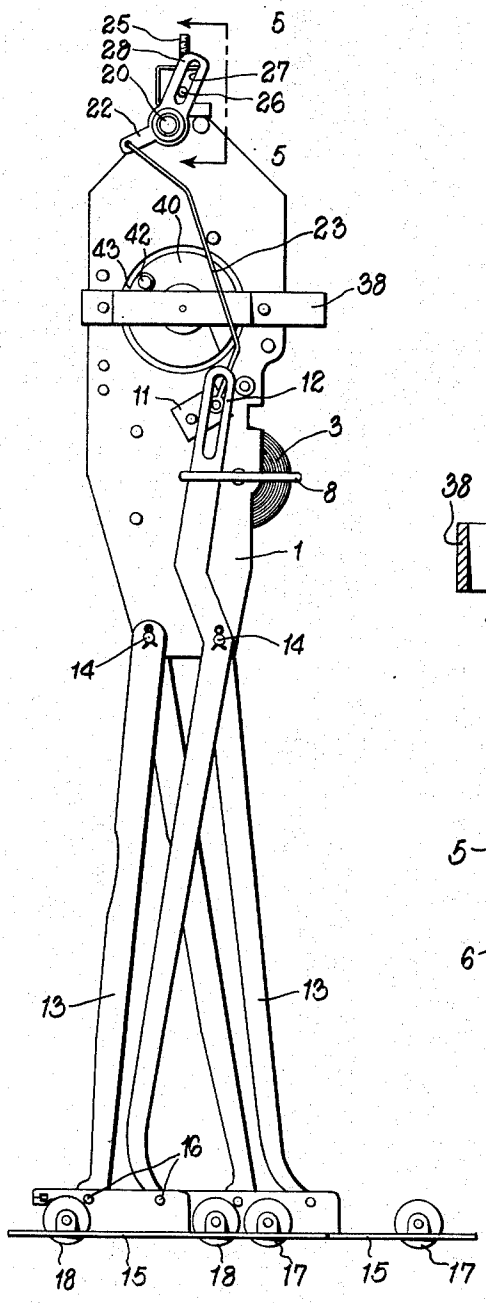
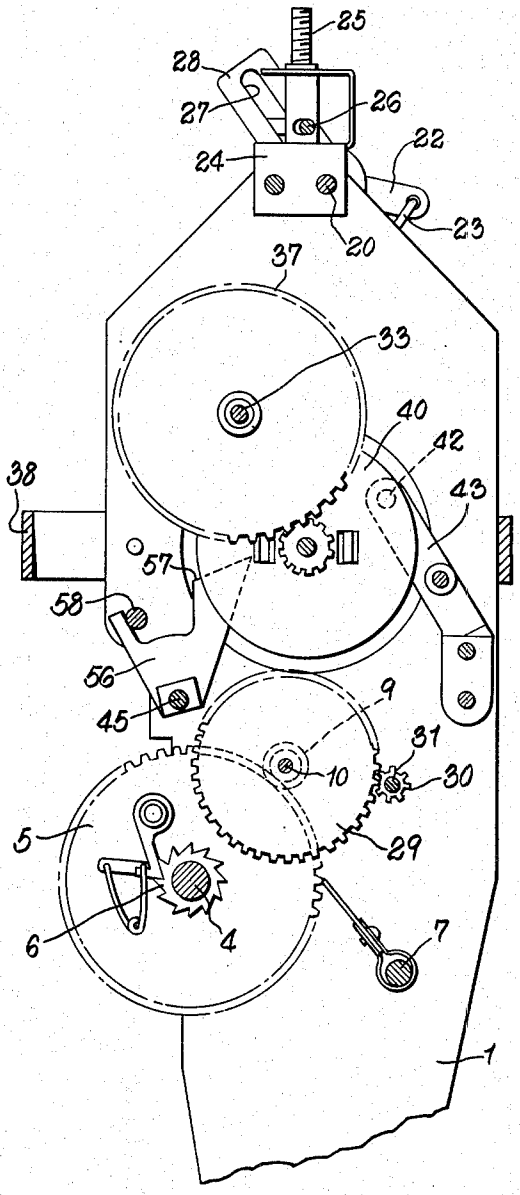


Fig. 2



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Fig. 4

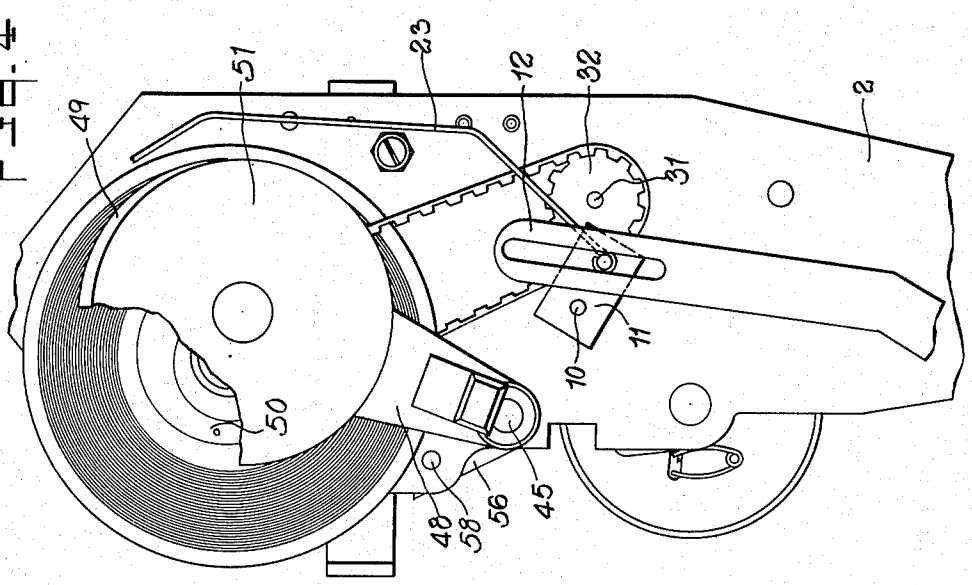
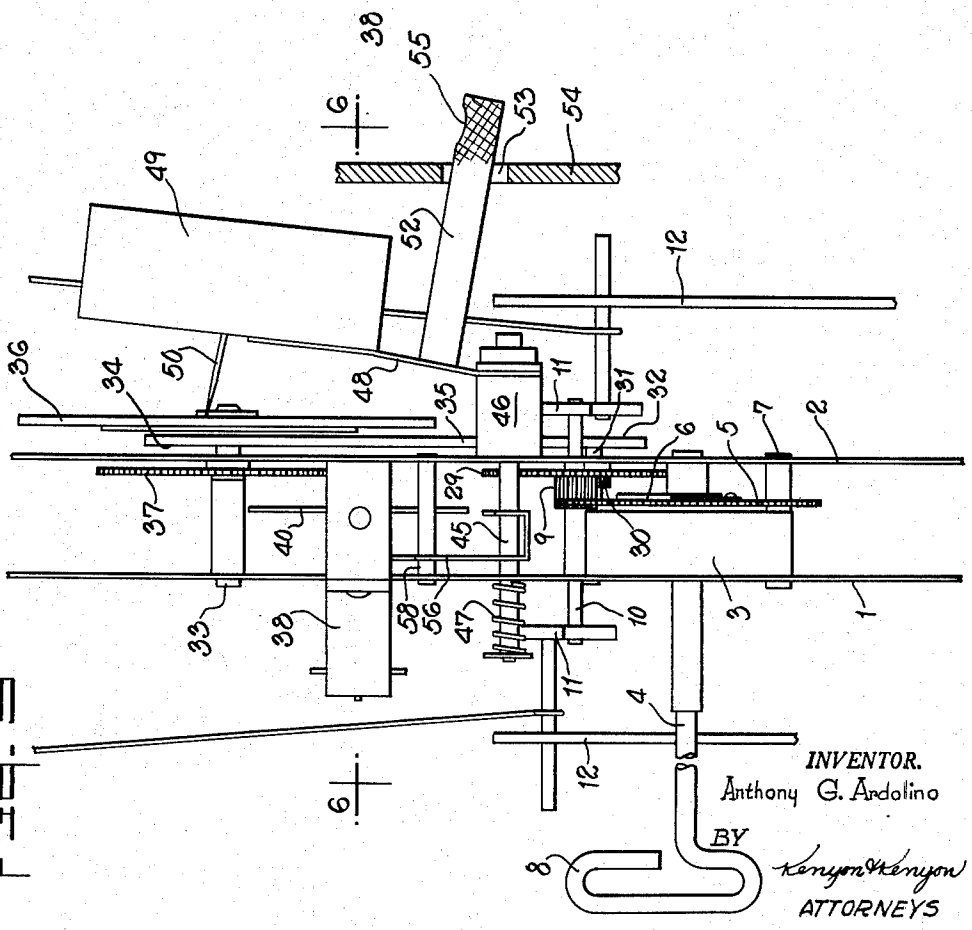


Fig. 3



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Fig. 5

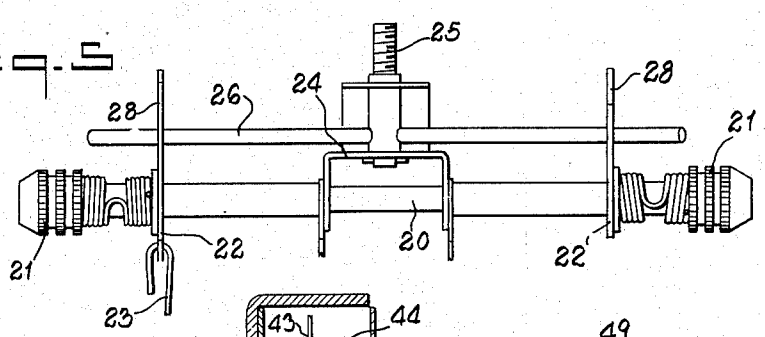


Fig. 6

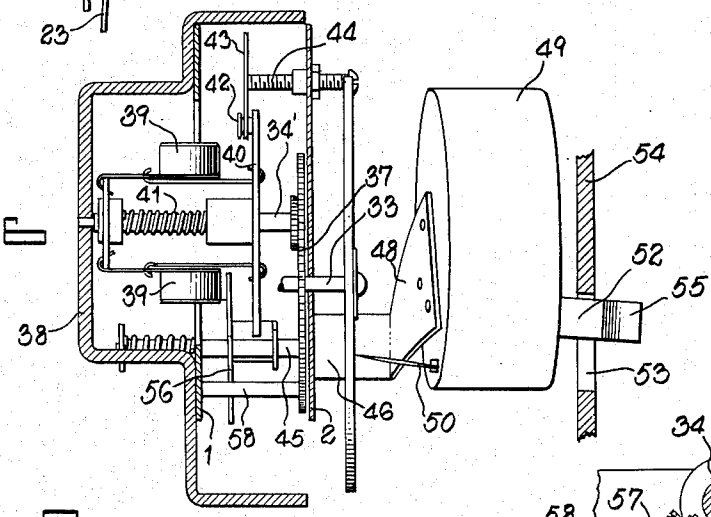
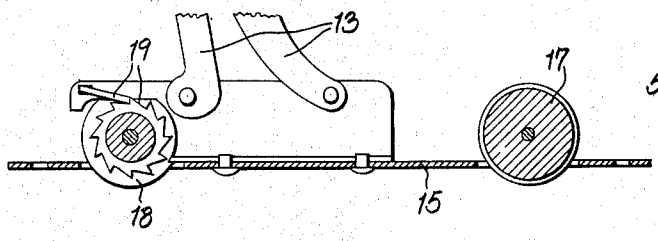


Fig. 9



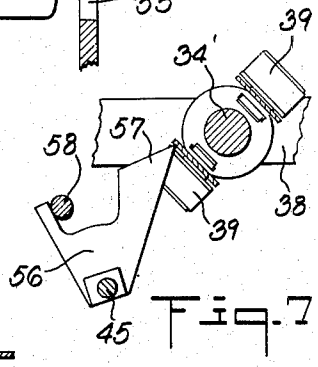


Fig. 7

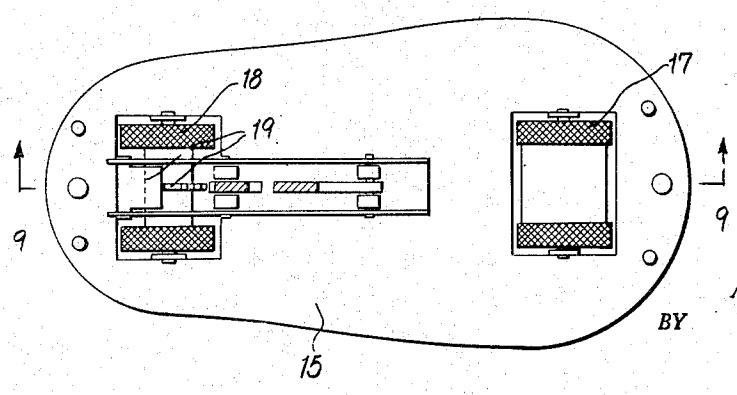


Fig. 8

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United States Patent Office 2,695,472
Patented Nov. 30, 1954

2,695,472

WALKING AND TALKING DOLL MECHANISM

Anthony G. Ardolino, Orange, Conn.

Application December 11, 1953, Serial No. 397,701

4 Claims. (Cl. 46—98)

This invention relates to a walking and talking doll mechanism. The walking and talking functions are performed by this mechanism and the latter also forms the framework and support for the legs, body, arms and head of the doll.

One of the objects is to provide a mechanism which is self-powered and causes the doll to walk in a balanced manner and while saying complete sentences, singing songs and the like in a completely intelligible manner. Another object is to provide such a mechanism in a form capable of mass-production, which has a long and reliable service life and which permits the talking function to be performed without interference by the walking motion. Still another object is to provide an arrangement for using a phonograph record of the rotary disk type in a mechanism of this character and which may be repeatedly reset without any danger of scratching the necessary reproducing needle or stylus across the groove so as to increase the record's normal surface noise and interfere with the fidelity of the sound reproduction. Other objects may be inferred from the following disclosure.

A specific example of the mechanism is illustrated by the accompanying drawings in which:

Fig. 1 is a side elevation;

Fig. 2 is a vertical section of the upper portion of the mechanism shown by Fig. 1;

Fig. 3 is a front view of the upper portion of the mechanism;

Fig. 4 is a partially broken-away elevational view corresponding otherwise to Fig. 2;

Fig. 5 is a detail view taken on the line 5—5 in Fig. 1;

Fig. 6 is a cross section taken on the line 6—6 in Fig. 3;

Fig. 7 is a sectional view showing details;

Fig. 8 is a cross sectional view of one of the foot elements of the mechanism; and

Fig. 9 is a section taken on the line 9—9 in Fig. 8.

This illustrated mechanism includes two flat upstanding plates 1 and 2 which are rigidly positioned in laterally interspaced relationship. The power for the mechanism is obtained from a spiral spring 3 located between the plates 1 and 2 with its inner end anchored to a winding key shaft 4 connecting with a driving gear 5 by way of the usual ratchet and pawl connection 6. The outer end of the spring is anchored to a rivet 7 which extends between the plates 1 and 2. The shaft 4 has a finger handle 8 which extends through the doll body so that the mechanism's spring may be wound.

The gear 5 is of large diameter and meshes with a pinion 9 secured to a shaft 10 extending through the plates 1 and 2 and having crank arms 11 on each of its opposite ends. These cranks 11 directly engage extensions 12 forming parts of the two leg parallelograms 13 which are respectively pivoted to the lower ends of the plates 1 and 2 by pivots 14. The lower ends of the parallelograms 13 are in each instance pivoted to a foot platform 15, by rivets 16, the platform 15 mounting forward wheels 17 which are rotatively free, and rear wheels 18 which are provided with a ratchet and pawl connection 19 with the platform 15, whereby the wheels 18 turn with forward motion of the platform 15 but are locked against motion when the platform 15 tries to move backwardly.

All of the parts described may be stamped from sheet metal, excepting for the gears and ratchet wheels, and assembled in a predetermined manner so that the mechanism is self-supporting when standing upright. Rotation of the crank arms 11, which are oriented 180° apart, causes the parallelograms 13 to reciprocate back and forth with the platforms 15 parallel to the floor, the wheels 18 in each instance locking its platform against backward motion. Thus the mechanism walks forwardly in good balance and without support.

To give a more realistic motion the upper portion of the mechanism mounts a horizontal shaft 20 which laterally extends to provide doll arm mountings 21, each of these mountings being rotatively mounted on the shaft 20 and provided with a bell crank 22 having one arm pivotally connected with the crank arm 11, on that side, by means of a connecting rod 23. As the mechanism walks the mountings 21 are, therefore, oscillated so as to swing the doll arms back and forth realistically. At the top of the mechanism a bridge 24 extends between the plates 1 and 2 and pivotally mounts a vertical doll head mounting 25 from which a cross bar 26 extends through slots 27 formed in the other arms 28 of the previously described bell cranks. Therefore, the head mounting 25 is rotatively reciprocated as the mechanism walks, thus causing the doll head to move realistically in cadence with the swinging of the parallelograms and the rotative oscillations of the arm mountings 21.

The speed of the mechanism is controlled by a governor of the type used on good, spring powered phonograph motors. The drive from the main power shaft 10 to the governor, required to actuate the latter, is also used to drive the rotary phonograph record disk.

Thus, a large gear 29 is fixed to the shaft 9 and this large gear meshes with a pinion 30, these parts being between the two plates 1 and 2. The shaft 31 for the pinion 30 extends through the plate 2 and mounts a sprocket 32 closely beside the outside of the plate 2. The phonograph record driving shaft 33 is mounted between the two plates 1 and 2 and extends through the plate 2 parallel to the shaft 31, the shaft 33 having a larger diameter sprocket 34 secured to it and a rubber belt 35 of the type having internal teeth is looped tautly around both of the sprockets 32 and 34. The shaft 33 is mounted near the upper end of the mechanism where there is the maximum room inside of the body, and the shaft extends beyond the sprocket 34 and removably mounts a miniature phonograph disk 36.

The drive to the governor is completed by a speed increasing gear train 37 starting from the shaft 33 and extending to the governor shaft 34, the plate 1 being formed with an opening through which the governor extends and the outer end of the shaft 34 being mounted by a bridge 38 mounted on the outside of the plate 1. The governor itself consists of the usual sprung weights 39 which with increased shaft speed throw out centrifugally and pull up a brake plate 40 against the bias of a compression spring 41. A stationary brake block 42 is positioned to be engaged by the plate 40 when the proper operating speed is reached. This block 42 is mounted by a spring arm 43 against which an adjustment screw 44 bears so as to permit adjustment of the location of the block 42 and, therefore, adjustment of the mechanism's operating speed.

Returning now to the phonograph record 36, the speed of which is, of course, also governed by the same governor described, it is obviously necessary to provide a spring biased pickup arrangement to obtain the sound from the record, because of the latter's vertical position. Furthermore, the walking motion of the mechanism means that the pickup must operate adequately when subjected to forces which are unusual in the sound equipment field. In addition to these factors, the pickup must be capable of being reset by a child using the doll, with the least possible danger of the necessary needle or stylus being dragged transversely across the record grooves.

With the above in mind, a shaft 45 extends transversely through and beyond both outsides of the two plates 1 and 2 at a location spaced downwardly from the periphery of the record 36 when the latter is mounted for playing. Outside of the plate 2 the shaft 45 has a spacing hub 46 rigidly secured to it, and beyond the outside of the plate 1 the shaft 45 has a compression spring 47 which encircles the shaft and spring biases the shaft 45 so as to maintain the hub 46 pulled against the plate 2. The shaft 45 and hub 46 are rotatively mounted relative to the plates 1 and 2. The outer end of the hub 46 has a flat cantilever spring 48 rigidly fixed to it and this spring extends upwardly and, functioning as a tone arm, mounts the pickup 49 from which the needle 50 ex-

tends inwardly so as to engage the grooves of the record 36. This part 49 is a combination pickup and loud speaker. It is of the type wherein the needle 50 is connected by a motion amplifying system with a conical paper diaphragm 51, the parts being mounted in a cylinder which by resonance tends to reinforce acoustically the action of the diaphragm 51. Pickup devices of this type are generally used for acoustical effects in the toy field.

The spring 47 keeps the hub 46 solidly mounted so that it is not subject to vibration caused by the needle 50, yet the hub 46 is free to turn. The needle 50 is biased against the groove of the record 36 by the firm action of the flat cantilever spring 48, so when set at the start of the record the needle 50 positively tracks the record groove without groove-jumping, and this sound box providing the diaphragm 51 is adequately held against vibrations such as might produce unpleasant sound effects.

A particularly important feature of the present invention is the incorporation into the above mechanism of a finger lever 52 which is rigidly secured to the cantilever spring 48 between the sound box and the hub 46 and which extends transversely from the spring 48 far enough to project through a transversely elongated slot 53 formed in the doll body generally indicated by the wall 54. The slot 53 may be arcuate to coincide with the arcuate motion of the finger lever 52 when the latter is used to swing the spring 48 so as to swing the sound box or reproducer 49 to bring the needle 50 from the end of the record groove back to the start of this groove. This finger lever has its outer end provided with a finger depression 55 so that a child may press her finger tip on this depression 55 and swing the lever 52 as required to bring the needle 50 to the start of the record groove.

The pressure with which the hub 46 is forced against the plate 2 by the spring 47 prevents this hub 46 from turning with complete freedom. This frictional restraint has the advantage of preventing the sound reproducer from swinging so freely as to cause trouble during the action of the mechanism while walking. Furthermore, it makes it necessary to use a fair degree of force when swinging the lever 52 to reset the needle. The child exerts this force naturally by pressing down hard on the depression 55 with her finger tip while swinging the parts, and in doing this she automatically flexes the spring 48 so that the needle 50 is clear from the record while being returned to the start of the record groove. The resetting action is simple and positive yet in this foolproof manner it prevents the needle from being scratched across the record.

The groove of the record 36 may terminate with the usual rapid spiral provided for automatically stopping in the case of a phonograph. The shaft 45 has a fork 56 fixed to it so that one prong of the fork, at 57, engages positively with a part of the governor so as to lock the latter against rotation when the needle 50 is moved over by the run-out or stopping groove spiral. A pin 58 is positioned so that when the child swings the lever 52 forwardly the forward portion of the part 57 engages this pin 58 when the needle 50 is positioned opposite to the start of the record's sound groove.

It can be seen that to start the mechanism the child uses the lever 52 as previously described so as to set the needle at the start of the record, and while doing this there is practically no danger of scratching the record with the needle. As the record approaches its end the sound groove may include speech indicating that the doll incorporating the mechanism, has become tired and would like to be picked up. Promptly thereafter the needle may run into the run-out groove so as to automatically stop the mechanism as described. The action involved in winding the spring, to power the mechanism, is obvious.

I claim:

1. A walking and talking doll mechanism including a frame, a shaft mounted by the frame, a motor for rotating the shaft, a phonograph disk record mounted on the shaft, a pivotal mounting beyond the periphery of the record, a cantilever spring extending from the mounting with an end mounting a sound box from which a needle extends to playing engagement with the record, and a rigid lever extending transversely from the spring between the mounting and sound box so that when the lever is depressed and swung the sound box and its needle are lifted to free the needle from the record while also swinging the sound box, the pivotal mounting having a frictional engagement with a relatively immovable surface and having a spring by which the mounting is biased towards the latter.

2. A walking and talking doll mechanism including a frame, a shaft mounted by the frame, a motor for rotating the shaft, a phonograph disk record mounted on the shaft, a pivotal mounting beyond the periphery of the record, a cantilever spring extending from the mounting with an end mounting a sound box from which a needle extends to playing engagement with the record, and a rigid lever extending transversely from the spring between the mounting and sound box so that when the lever is depressed and swung the sound box and its needle are lifted to free the needle from the record while also swinging the sound box, the pivotal mounting having a frictional engagement with a relatively immovable surface and having a spring by which the mounting is biased towards the latter, the frame having parallelogram walking legs pivoted thereto and which have foot platforms with rollers equipped with reverse-rotation locks, and means for connecting these legs to said motor for oscillation thereby, whereby a single motor powers both the record and the legs.

3. A walking and talking doll mechanism including a frame, a shaft mounted by the frame, a motor for rotating the shaft, a phonograph disk record mounted on the shaft, a pivotal mounting beyond the periphery of the record, a cantilever spring extending from the mounting with an end mounting a sound box from which a needle extends to playing engagement with the record, and a rigid lever extending transversely from the spring between the mounting and sound box so that when the lever is depressed and swung the sound box and its needle are lifted to free the needle from the record while also swinging the sound box, the pivotal mounting having a frictional engagement with a relatively immovable surface and having a spring by which the mounting is biased towards the latter, the frame having parallelogram walking legs pivoted thereto and which have foot platforms with rollers equipped with reverse-rotation locks, and means for connecting these legs to said motor for oscillation thereby, whereby a single motor powers both the record and the legs, the cantilever spring being a flat spring positioned in the general plane through which it swings while playing the record.

4. A walking and talking doll mechanism including a frame, a shaft mounted by the frame, a motor for rotating the shaft, a phonograph disk record mounted on the shaft, a pivotal mounting beyond the periphery of the record, a cantilever spring extending from the mounting with an end mounting a sound box from which a needle extends to playing engagement with the record, and a rigid lever extending transversely from the spring between the mounting and sound box so that when the lever is depressed and swung the sound box and its needle are lifted to free the needle from the record while also swinging the sound box, the frame having parallelogram walking legs pivoted thereto and which have foot platforms with rollers equipped with reverse-rotation locks, and means for connecting these legs to said motor for oscillation thereby, whereby a single motor powers both the record and the legs, the motor having a rotary governor, and a lever swinging with the said cantilever spring through a path bringing the lever into stopping engagement with the governor when the end of the record is reached, whereby the mechanism stops walking when the record playing is ended.

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