APPARATUS FOR ANIMATING A JOINTED FIGURINE

Stan M. Silver, New York, N. Y.

Application December 12, 1955, Serial No. 552,399

18 Claims. (Cl. 40—28.2)

The present invention relates to an articulated figurine and to the means for imparting animated motion to such figurine. More specifically, the invention relates to such figurine and the animating means therefor that may be associated with and actuated by a phonograph or similar mechanism having a turntable.

It is an object of the present invention to provide an articulated figurine and animation means therefore, of the character described, that may be associated with and actuated by the mechanism of substantially any conventional, box-type or similar grooved-disc sound record player or phonograph, or other device having a turntable on which such a sound record may be mounted for reproduction.

It is another object of the present invention to provide devices of the character described that may be operated simultaneously with the playing of a sound record on such phonograph or the like, whereby the motion of the figurine will accompany the reproduced sound.

It is also an object of the present invention to provide devices of the character described wherein the animation of the figurine and the movement of its articulated members are directly and positively effected and controlled.

It is still another object of the present invention to provide devices of the character described wherein the animation effecting and controlling means may be formed to have the imparted movements of the figurine and its members and their tempo synchronized with the tempo of the sound reproduced from the simultaneously played sound record.

It is a further object of the present invention to provide devices of the character described in which the controlled and regulated animation of the figurine may be continued for a relatively appreciable and prolonged period of time.

It is a still further object of the present invention to provide devices of the character described which may be readily and easily assembled with and disassembled from the accompanying phonograph, or the like, and may be readily and easily adjusted for assembly with phonographs, or the like, of varying sizes and shapes.

The foregoing and other objects and advantages of the articulated figurine and means for its animation, of the present invention, will become more readily apparent to those skilled in the art from the embodiment thereof shown in the accompanying drawings and from the description following. It is to be understood, however, that such embodiment is shown by way of illustration only, to make the principles and practice of the invention more readily comprehensible, and without any intent of limiting the invention to the specific details therein shown.

In the drawings:

Fig. 1 is a perspective view of the devices of the present invention shown installed and assembled with a conventional type of grooved-disc record player or phonograph; partly broken away, to show structural details; Fig. 2 is an enlarged, sectional and partly elevational view of the same;

Fig. 3 is a top plan view showing the relative position of the sound record and the animating record of the present invention;

Fig. 4 is an enlarged, fragmentary, elevational and partly sectional view of one embodiment of an articulated figurine of the present invention, its supporting means and the animating track of the animation record;

Fig. 5 is an enlarged, fragmentary, perspective view of one form of skeletal structure and articulative connections of the figurine of the invention and,

Fig. 6 is an enlarged, vertical sectional and partly elevational view of the head and hat mounting for the figurine.

Generally stated, the invention consists in the provision of a sound record of relatively large diameter, having its sound grooves formed on the outer marginal portion of one of its surfaces, and a superposable, companion, animation record of lesser diameter and having a spiral, grooved, preferably double grooved, animation track, with the groove or grooves having an irregularly undulating bottom into which extends a terminal portion of an articulated or pivoted member of a figurine, to which member another articulated member of the figurine is directly and positively connected for concurrent movement therewith. The invention further consists of means for supporting the figurine in laterally movable position over the animation record and of additional means for slowing the movement of the animation record relative to the movement of the sound record while both are moved by the phonograph mechanism, so that they will both be operative for the same length of time.

More specifically stated, the invention consists of several parts and mechanisms that may be separately associated with a grooved-disc record player, such as the phonograph 10, which may be of any suitable kind, mechanically or electrically, having a turntable 12, a centering pin 14, a sound arm 16, and a sound box 18 holding the needle 20, all of which parts may be of any suitable conventional type.

One of the several elements of the devices of the present invention consists of a grooved-disc sound record, generally designated as 22, which may be formed of conventionally used material and may be of relatively large, as maximum conventional diameter, and having the central opening 24 for engagement over the centering pin 14 of the phonograph. The record 22 is provided with sound grooves 26, preferably only on the peripheral portion of its upper surface, leaving the central portion ungrooved, and is provided with the same surface, around and relatively closely adjacent to the opening 24, with an annular rib of rectangular cross-section in which are formed gear teeth to provide an annular crown gear 28, the rib being, preferably, of greater height than the gear teeth, to provide clearance.

Another of the elements of the devices of the present invention comprises a companion disc record, generally designated as 32, which may be formed of any suitable material and may be thicker than the record 22 and of a diameter substantially equal to the diameter of the ungrooved portion of the record 22. The record 32 is provided with a central, centering opening 34, and with a crown gear 42, similar in construction to the crown gear 28, on its underside, adjacent its peripheral edge, so that the crown gear 42 is of substantially greater diameter than the crown gear 28.

The record 32 is provided on its upper surface with an animation track consisting of one or more and preferably:
a pair of spirally arranged parallel animation grooves 38, each having a vertically and irregularly undulating bottom 40, by means of a spool and for their simultaneous movement by it at different rates of speed, so that the animation record 32, whose double grooved animation track is of relatively great width and would require, or could not project an area if moved at the same rate of speed as the sound record 22, may move at a much slower rate of speed than the sound record, so that both of the records may act for the same length of time.

Such means comprises a preferably threaded post 44, set into a suitable supporting base 46, by which it may be supported. The phonograph supporting surface and which may, if desired, be in the form of a suction cup, as illustrated. The post 44 may be rendered vertically adjustable by carrying an internally threaded sleeve 48, which is provided at its lower end with a laterally extending stud 50, in which is formed a socket 52, for receiving therein the ball 54, at one end of a rod 56, to form a ball and socket joint therewith. The rod 56 is also provided with a ball 58 at its other end, which engages within the socket 60, formed in the side of a coupling block 62. The coupling block 62 is formed with a recess 64 in its underside, which is adapted to fit over the centering pin 14 of the phonograph, to permit the latter's free rotation within such recess.

The coupling block 62 is preferably formed with a flat top surface 66, in which is formed a preferably small, centrally disposed recess 68, in which may freely rotatably fit the pinion 70 and its supporting rod 56 and companion pinion 76 to rotate counterclockwise, and the latter, engaging crown gear 42, will cause the animation record to rotate in a counterclockwise direction, opposite to the direction of record 22. This difference in rotational direction is made possible by the coupling block 62 which is interposed between the centering pin 14 of the turntable 12 and the animation record support 74.

It will also be clear that because of the greater radius and length of the crown gear 42 relative to rack 28, the disc or record 32 will rotate at lesser speed than the record 22, at a ratio inverse to the ratio of their respective lengths.

The sleeve 48 is provided, at its upper end, with a laterally extending arm 80, adapted to be disposed to overhang the animation disc 32, when the latter is in position on a phonograph, and to provide movement on a horizontal plane over the animation disc 32, for the articulated figurine, generally designated as 82. For firmer support of the figurine 82, the arm 80 is preferably of irregular cross-section, such as the cross-shaped cross-section illustrated, and engages in a similarly shaped, closely fitting opening 84, formed in a preferably handles extension 86, provided on the figurine 82, as on the back of its torso portion 88.

The torso 88 of the figurine 82 is preferably hollow and is provided with pivoted appendages, such as the arms 90, having the jointed elbows 91, and the legs 92, having the jointed knees 93, which legs and arms are pivotally supported thereon in suitable position for movement in a vertical plane. The legs and arms 92 and 90 are preferably of light but sufficient weight, to be easily raised in position and to just as easily automatically and gravitationally drop to lower position.

The legs 92 which are directly actuated for movement by the animation disc 32, as will hereinafter be made clear, are each positively connected to an arm 90, for positive simultaneous movement of the arm with its connected leg. Preferably, such connection is effected between opposite body members; the right leg being connected to the left arm, and vice versa. Preferably, the pivotal mounting means for the arms and legs also serve as at least part of the interconnecting means between them.

Thus, each of the legs 92 may be supported by an L-shaped bar horizontally disposed and rotatably supported within the torso 88. Such bar may comprise a longer, laterally extending arm 94, rotatably supported, as in eyes 95, set into the wall of the torso, with one end projecting from the torso and set in a suitable recess in the upper portion of the leg 92; the other arm of the bar 96, extending forwardly within the torso and is provided with an aperture 98 at its free end. For improved connection between the bar arm 94 and the leg 92, at least the leg engaging portion of the bar arm 94 may be of polygonal cross section and the recess in the leg receiving it of corresponding shape. The bar arms 94 may terminate short of one another within the torso.

The figurine arms 90 may be similarly mounted on L-shaped bars having the laterally extending bar arms 100, each supported in eyelets 102, set in the torso wall, the free end of which bar arms each extends to the exterior of the torso to support an arm 90. Said bar arms 100 preferably overlap within the torso and each has a forwardly extending bar portion 104 with an opening 106 formed therein at its free end. The bar arms 100 overlap in a manner to bring the right arm 104 in vertical register with the left bar arm 96, and the left bar arm 104 in vertical register with the right bar arm 96, so that they preferably overlap within the torso and each has a forwardly extending bar portion 104 with an opening 106 formed therein at its free end. The arm bars 100 overlap in a manner to bring the right arm 104 into vertical register with the left bar arm 96, and the left bar arm 104 into vertical register with the right bar arm 96, so that they preferably overlap within the torso and each has a forwardly extending bar portion 104 with an opening 106 formed therein at its free end.

In this manner, the upper movement of the right leg 92 will turn the bar arm 94 to tilt its associated arm 96 upwardly. This, in turn, will move the rod 108 upwardly, to tilt the bar arm 104 connected thereto, which turns the bar arm 100 and thereby raises the arm 90 supported thereby.

Motion is imparted to the legs 92 by the undulations of the bottom 40 of the grooves 38 of the animation track of the animation disc 32, as the latter rotates; the figurine being supported over such disc with its legs contacting such groove bottoms, each within one of said grooves. However, because the space between legs 92 is generally greater than the space separating the two grooves 38 of the animation track, and also because it is desirable to provide a degree of springiness and resilience to the movement of the legs 92, to avoid rough and jerky movement thereof, there is provided at the bottom of each leg an inverted L-shaped spring wire 110, which is connected by one end to the bottom of the leg 92, its other end facing the other leg and depending to engage within one of the grooves 38 of the animation track.

Additional movable figurine parts, animated, either directly or indirectly, in response to the undulations of the bottoms 40 of the animation track grooves 38, may be provided on the figurine 82. In the illustrative embodiment of the invention, such additional movable parts consist of a head 112 and a hat 114. The head 112 comprises a hollow body of suitable shape, having a neck opening and a slot 116, at the top thereof, and provided on its face side with a nasal projection 118 and eye openings 120. The
head is associated with a separate, unconnected jaw portion.

To mount the head 112, hat 114 and jaw 122, for movement in response to the undulations of the animation track of the disc 32, there is provided at the corner of one of the L-shaped arm supporting bars an upwardly directed extension 124, on which is mounted a cylinder 126, into the upper face of which is set an upright, resilient rod 128, and one end of a coil spring 130. The jaw 122 is secured by its inner end to the rod 128, immediately above the surrounding coil spring 130. Above the jaw, the rod 128 carries a curved plate 132, on which are provided, in suitably spaced position, eyeballs simulating discs 134.

The head 112 is mounted over the rod 128, whose free upper end projects through the slot 116, and over the plate 132, and is secured in position by the upper end of the coil spring 130 which engages the rear edge of the neck opening of the head, as at 136, in position to have the eye openings 120 register, when the figurine is at rest, with the eye discs 134. The hat 114 is mounted on the upper end of the rod 128, in fixed position thereon.

It will be apparent that, as the arm supporting bar carrying the bar extension 124 is tilted in response to the record induced movement of the legs 92, the rod 128 will move vertically as well as side to side, to move the jaw 122 and plate 132, supported thereon and also the hat 114 at its end. Such motion will also cause the coil spring 130 and head 112 attached thereto to undergo similar movement, all in substantial synchronization with the movement of the legs 92 and arms 90 and, therefore, with the undulations of the bottom 40 of the animation track grooves 38, and, if desired, with the tempo and beat of the sound of record 22, with which such undulations may be synchronized.

This completes the description of the animating apparatus of the present invention; and it may here be stated that, while the animated figurine has been illustrated as that of a human, the invention need not be limited to a human figurine; but, that the apparatus of the invention is equally operable in connection with other types of figurines, whether of animate or inanimate nature.

It will be apparent from the foregoing description that the apparatus of the present invention comprises a practical, efficient and interesting device not only for effecting movement of a figurine simultaneously with the reproduction of sound, but also for synchronizing the movement or motions of the figurine or its several members with the sound by arranging the undulations in the floor of the grooved, spiral animating track in a predetermined manner to effect such synchronized motion.

It will also be apparent that the apparatus of the present invention, particularly that part of the apparatus excluding the turntable and the mechanism for rotating it, is of relatively simple construction, relatively easy to assemble and set up, is of relatively universal adaptability with phonographs and record players of substantially any type; and is relatively economical in cost.

It will be further apparent that numerous variations and modifications in the apparatus of the present invention, in the mechanism adapting the figurine and motion record for use with record players or phonographs, as well as in the shape, form, type and structure of the figurine, may be made by any one skilled in the art, in accordance with the principle of the invention hereinabove set forth, and without the exercise of any inventive ingenuity. I desire, therefore, to be protected for any and all such variations and modifications that may be made within the spirit of the invention and the scope of the claims hereof appended.

1. Figurine animating apparatus, comprising, in combination with a turntable and means for rotating the same, a disc supportable on said turntable for rotary movement thereby, said disc having a spirally grooved track formed therein, said grooved track having varying depth to provide a floor of uneven level therein; a figurine, including a main body portion and a member pivotally secured thereon for vertical movement and resilient wire means having one end receivable within said grooved track and connected to said movable member for actuating the same in response to the level variations in the grooved track floor; and means above said turntable mounting said figurine for horizontally and radially sliding movement over said disc.

2. Figurine animating apparatus, comprising, in combination with a turntable and means for rotating the same, a disc having a spirally grooved track formed thereon, said grooved track being of varying depth to provide a floor of uneven level; means mounting said disc on said turntable for rotation thereby; a figurine, including a main body portion and a member pivotally secured thereon for vertical movement relative thereto and resilient wire means having one end receivable within said grooved track supported on said main body portion and connected to said member for actuating the same in response to the floor level variations of said grooved track; and means above said turntable mounting said figurine in horizontally and radially sliding relation over said disc.

3. Figurine animating apparatus, comprising, in combination with a turntable and means for rotating the same, a disc having a spirally grooved track formed thereon, said track being of varying depth to provide a groove floor of uneven level; means mounting said disc on said turntable for rotation at a reduced rate of speed relative thereto; a figurine, including a main body portion and a member supported thereon for movement relative thereto and resilient wire means having one end receivable within said grooved track connected to said member for actuating the same in response to the floor level variations of said grooved track; and means mounting said figurine in horizontally and radially sliding relation over said disc, including an upright post, means for supporting said post in upright position, a horizontally disposed arm extending from an upper portion of said post and a transverse opening on said figurine within which said horizontal arm is receivable.

4. The apparatus of claim 3, wherein said horizontal arm is vertically adjustable on said upright post.

5. The apparatus of claim 3, wherein said upright post is telescopic and comprises a threaded rod and an internally threaded sleeve, said horizontal arm secured to said threaded sleeve.

6. The apparatus of claim 3, wherein said main body portion is provided with a second member supported thereon for movement relative thereto and wherein means are provided for interconnecting said second member with said first member for simultaneous movement.

7. The apparatus of claim 3, wherein said main body portion is provided with a second member supported thereon for movement relative thereto at a diagonally opposed portion thereof relative to said first member, and wherein means are provided for interconnecting said second member with said first member for simultaneous movement.

8. Figurine animating apparatus comprising, in combination, with a turntable adapted to support a disc shaped sound record and having a centering pin, an associated sound arm having a sound box at the end thereof, and means for rotating said turntable, a sound record of relatively large diameter supportable on said turntable in centered position on said pin, said record having sound reproducing grooves formed on the peripheral portion of its upper face, a disc of lesser diameter than said sound record having a spirally grooved track on its upper surface of varying depth to provide a floor of uneven level; means mounting said disc on said turntable above said sound record and concentrically therewith for rotation by said turntable at a reduced speed relative to said turntable; an animative figurine, including a main body portion and at least one body member supported thereon for move-
ment relative thereto, means connected to said member extending into said grooved track for moving said member in response to the variations in the floor level of said track, and means for rotating said turntable, of a sound record of relatively large diameter supportable on said turntable in centered position on said pin, said record having sound reproducing grooves formed on the peripheral portion thereof, a disc of lesser diameter than said sound record having a spirally grooved track on its upper surface of varying depth to provide a floor of uneven level; means mounting said disc on said turntable above said sound record and concentrically therewith for rotation by said turntable at a reduced rate of speed relative to said sound record; and an animative figurine, including a main body portion and at least one body member supported thereon for movement relative thereto, means connected to said member extending into said grooved track for moving said member in response to the variations in the floor of said track; and means mounting said figurine for horizontal slidably movement radially of said turntable, including a post, means for supporting said post in upright position alongside said turntable, a horizontally disposed arm extending from an upper portion of said post, and a transverse opening in said figurine slidably engageable on said arm.

10. The apparatus of claim 9, wherein said horizontal arm is vertically adjustable on said upright post.

11. The apparatus of claim 9, wherein said upright post is telescopic and comprises a pair of interengaged threaded portions and wherein said horizontal arm is secured to the uppermost of said threaded portions.

12. The apparatus of claim 9, wherein the means for mounting said disc on said turntable comprises a block having registering recesses in opposed faces thereof, one of said recesses adapted to fit freely movably over the end of said centering pin, a second centering pin having a projection at its lower end adapted to fit freely movably in the second of said recesses in said block and having a laterally extending flange at its lower end adapted to support said disc thereon, a circular crown gear on the ungrooved underside of said disc adjacent its periphery, the teeth of said rack being spaced from the surface of said disc, a circular crown gear of relatively lesser diameter provided on the grooved surface of said sound record in proximity to the center thereof, the teeth of said groove spaced from the surface of said sound record, a rod flexibly and rotatably connected by one end to said block and by its other end to said post, said rod having a pair of pinsions fixed thereon, one of said pinsions engaging said disc crown gear and the other of said pinsions engaging said sound record crown gear.

13. The apparatus of claim 9, wherein said main body portion has a plurality of members supported thereon for movement relative thereto and wherein said track comprises a plurality of closely spaced parallel grooves each having a floor of uneven level and wherein each of said members has means connected thereto extending into a groove of said track.

14. The apparatus of claim 9, wherein said body portion is a pair of members each individually pivoted to opposed sides of the main body portion thereof, and wherein said main body portion supports a pair of resilient wires each secured to one of said members and engaging within a groove of said track and normally resting on the floor thereof.

15. The apparatus of claim 9, wherein the means supported on said body portion comprises a resilient wire extending from said body portion into said disc track and resting on the floor of said track.

16. The apparatus of claim 9, wherein said figurine has a pair of members pivotally secured to opposed sides of the main body portion thereof, and wherein said main body portion supports a pair of resilient wires each secured to one of said members and each engaging within a groove of said track and normally resting on the floor thereof.

17. The apparatus of claim 9, wherein said figurine body has a pair of members each individually pivotally supported thereon for relative movement thereto, each on one side thereof, and wherein said track comprises a pair of closely spaced parallel, narrow grooves spirally formed in said disc, and wherein each of said members has means connected thereto and extending into said track, said means comprising a pair of resilient wires each connected by one end to one of said members and having its other end extending into a groove of said track.

18. The apparatus of claim 9, wherein said body is provided with a pair of members each individually pivotally supported thereon for relative movement thereto, and wherein both of said members have means connected thereto for engaging within said track, said means comprising a pair of resilient wires supported on said body and connected one to each of said members, and wherein said body has a second pair of members each individually pivoted on said body and means interconnecting a member of one pair with a member of the second pair, in diagonally opposed relation, and wherein said track comprises a pair of closely spaced parallel spiral grooves, each of said wires engaging within one of said grooves and resting on the floor thereof and responsive to the uneven level of said groove floor to move one of each pair of members in response to the variation of floor level in said groove.

References Cited in the file of this patent

UNITED STATES PATENTS

1,529,004 Barber Mar. 10, 1925
1,537,484 Meehan May 12, 1925
1,547,259 Hiblock et al. July 28, 1925
2,615,282 Ueltschi Oct. 28, 1925