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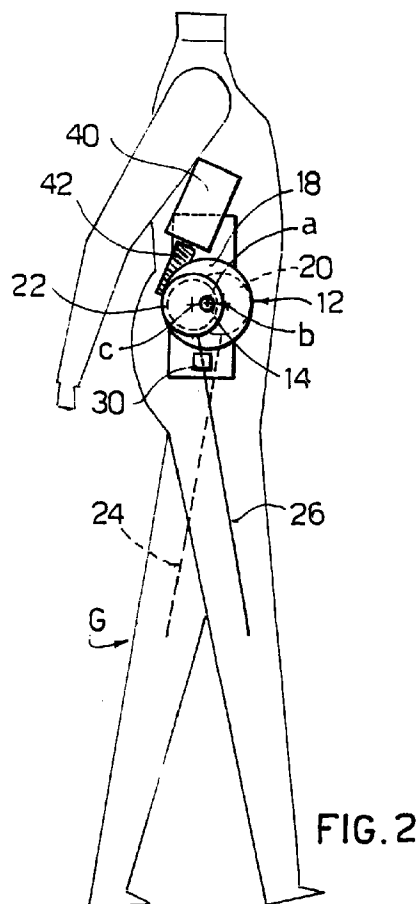
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(54) **Movement mechanism particularly for toys**

(57) A movement mechanism for toys, particularly to move the legs of a doll or a puppet with an alternating angular movement similar to walking, comprises a body (12) revolving around a first axis (a) and comprising a worm wheel (18) having integral eccentric side pulleys, angularly offset from each other. A control rod (24, 26) is constrained to each pulley by having an end revolving on the periphery of the pulley, an extension of the rod sliding within a slot or fulcrum (30, 32). Rotation of the worm wheel sets the rods in motion with an angular movement offset angularly for one rod and the other. Each rod is advantageously made of metal wire, which at the end constrained to the pulley forms a loop or ring sliding freely around the pulley.



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Description

The invention relates to a movement device for toys, particularly for moving the legs of a puppet or a doll with an alternating angular movement, so as to simulate walking. More particularly, the invention relates to a device particularly suitable for moving the legs of dolls of the flexible (so-called "flexy") type, i.e. without joints.

In the field of movements for toys there is constant tendency to create movement devices that are simple, easy to assemble, occupy little space, have a low cost and are nevertheless efficient.

In particular, for dolls of the "flexy" type, like those widely sold at present on the market, considerable difficulty is encountered in creating a movement device that can be housed in the small space available inside the doll and yet work efficiently.

A further aim is to create such a device with low production costs.

Said aims have been achieved with the device forming the subject-matter of the application as described in claim 1. Further characteristics are stated in the subsequent claims.

The new device comprises a body rotating around an axis, this body consisting of a drive wheel that bears two eccentric pulleys on opposite faces, said pulleys being integral with the wheel and offset in position to each other, generally by 180°. A control or drive rod is bound to each pulley, so that one end of said rod can revolve freely on the pulley, though being pulled by the pulley in its rotational movement around the axis of the drive wheel. The drive wheel meshes with a worm screw driven by a motor. The constraint between a rod and the relative pulley is preferably created by making the rod of metal wire with a part curved to form a loop or ring that fits in a groove in the pulley, so as to be able to slide circumferentially in said groove.

The new device comprises few parts that can be produced at a low cost and easily assembled, so that they have a limited production cost. These and other advantages and characteristics will be made clear by the detailed description given below, of a preferred but non-limiting exemplary embodiment, with reference to the attached drawings in which:

- Figure 1 is a front part-sectional view of the device, shown in a body of a doll, which has been diagrammatically drawn in phantom.
- Figure 2 is a side view of the device, from the left in Figure 1, with one supporting plate removed.
- Figure 3 is an exploded perspective view of the device, enlarged with respect to the preceding figures, in which for clarity's sake the motor and the drive worm screw as well as one of the supporting plates have been omitted.

With reference to the drawings, a movement device for toys is indicated as a whole by reference number 10 and comprises a rotatable body 12 rotatably supported, by means of coaxial pins 13, 14 between facing supporting plates indicated by 15 and 16. The rotatable body essentially comprises a drive wheel 18, generally peripherally toothed, on one side and the other of which respective pulleys 20, 22, are integral. Each pulley is eccentric with respect to said toothed wheel, that is to say the centre of the pulley 26 is situated on an axis b and the centre of the pulley 22 is placed on an axis c. The axes b and c are parallel and angularly offset around the axis a, preferably by 180° that is to say, the axes a, b and c are preferably coplanar. Each pulley has a radius greater than the distance between its center axis and the axis a. A drive rod is bound to each pulley; the drive rod bound to pulley 20 will be indicated by 24 and the drive rod bound to pulley 22 will be indicated by 26. Each rod and relative pulley are bound such that an end of each rod 24, 26 is freely sliding on a circumference of the respective pulley. Said binding or constraint can be effected in any suitable way, for example by constraining one end of each rod to a ring free to rotate in a path, e.g. a groove, 20', 22' respectively, of each pulley. According to a preferred embodiment of the invention, each rod is made of piano wire, as can be seen in figure 3, bent to form a loop or ring at one end, for example as illustrated in 27 for the rod 26, and the ring is received in the respective groove, for example 22', of the pulley 22. It will be noted that in this manner the unit formed by the body 12 and each rod 24, 26 forms a connecting rod-crank assembly. A further constraint for each rod 24, 26 is provided by a "fulcrum" 30, 32 respectively, consisting of a through hole 34 in a respective block 36, 38. The fulcrum 30 is integral with the plate 16 and the fulcrum 32 with the plate 15. Each fulcrum binds the relative rod to an oscillating lever-like movement whose fulcrum is precisely in the narrow part of the respective hole. Thus the rods 24, 26 have an angular movement offset with respect to each other, or a scissors-like movement, which can simulate a walking movement of two legs of a toy, indicated as a whole by the reference letter G in the figures. The device is made integral with the body of the toy through plates 15, 16; the drive wheel or worm wheel 18 is driven by a motor 40, which operates a worm screw 42 that meshes with the peripheral toothing of the wheel 18.

Batteries supplying the motor are not drawn and can be located in a suitable position, possibly contained within a backpack (not shown) on the back of the toy or doll.

Obviously variations and changes can be made to what is described without departing from the scope of the present invention.

Claims

1. A movement device particularly for toys, characterised in that it comprises: a body (12) rotatable

around a rotation axis (a), said body comprising a drive wheel (18); pulleys (20, 22) integral with said wheel, eccentric with respect to it and angularly offset around the axis of the wheel; and drive rods (24, 26), each constrained to one of said pulleys so as to have a part that slides on a path thereof, each rod being further constrained to make an angular movement by means of a fulcrum (30, 32) in a fixed position.

2. A device according to claim 1, characterised in that said pulleys (20, 22) have an extension that comprises a center of rotation (a) of the drive wheel (12).
10
3. A device according to claim 1, characterised in that a rod and the relative pulley are bound by means of a loop or ring (27) received in a revolving manner on a circumference of the pulley, one end of the rod being constrained to said loop or ring.
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4. A device according to claim 3 characterised in that each rod (24, 26) has one end bent over to form said loop or ring (27).
20
5. A device according to claim 1, characterised in that said fulcra consist of blocks (36, 38) in a fixed position, with a hole through which the respective rod passes.
25
6. A device according to claim 1, characterised in that it comprises a drive motor (40) that operates a worm screw (42), and said drive wheel (18) is a worm wheel meshing with said worm screw.
30
7. A device according to claim 1, characterised in that it comprises at least one plate for support and fixing to the toy, which carries the rotation axis (a) of said revolving drive wheel, said fulcra (30, 32) for the rods, and said motor (40).
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8. A device according to claim 1, to move the legs of a puppet or doll.
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9. A device according to claim 8, in which said doll or puppet is of the flexible ("flexy") type without joints.
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10. A device as described in the present document and shown in the attached drawings.
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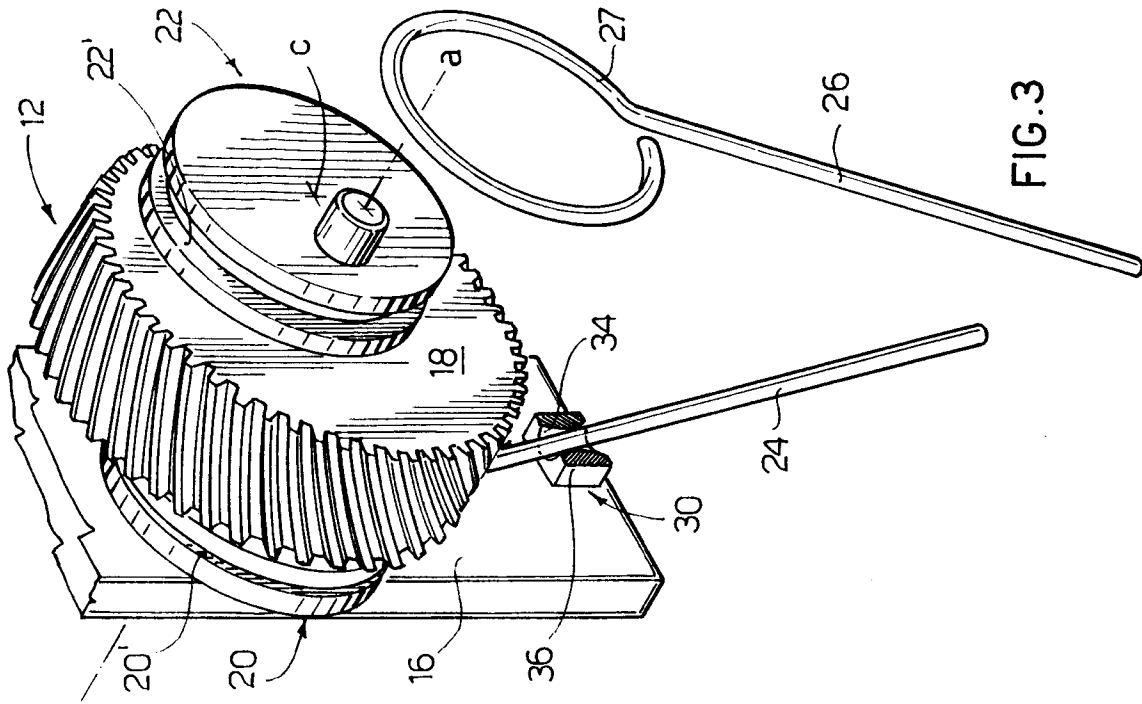


FIG. 3

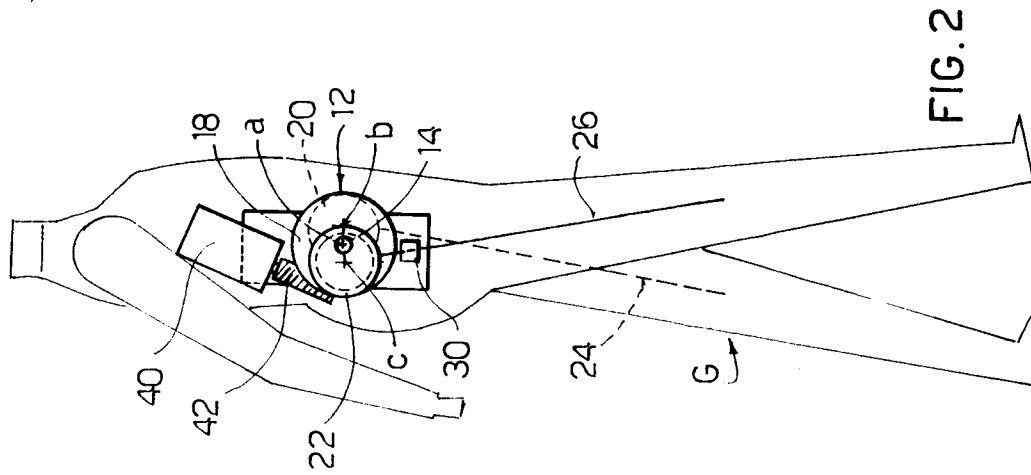


FIG. 2

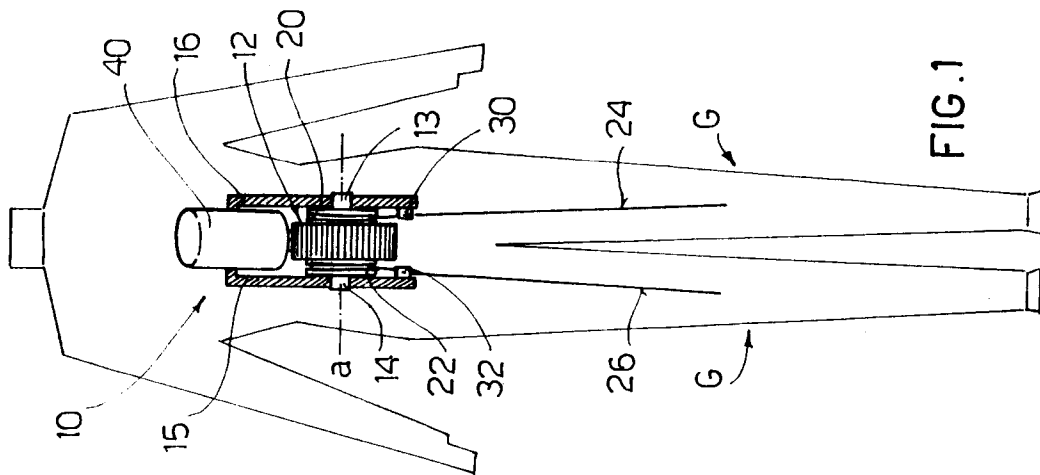


FIG. 1