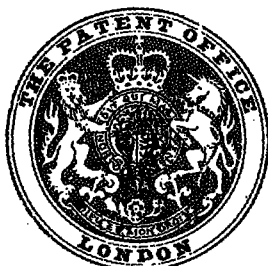


1.079.060



PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Gramophone Device for Incorporation in a Toy

We, TOMI KOGYO KABUSHIKI KAISHA a body corporate organised according to the laws of Japan, of No. 446 Hondentateishi-machi, Katsushika-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a gramophone device adapted to be easily accommodated within a body of a toy such as a doll or a toy modelled on an animal or a car and it is the principal object of the invention to provide such a gramophone toy that performs music playing, has simplified construction and can be operated easily.

In conventional gramophone toys of this kind hitherto used, a speaker cone is rigidly connected with a stylus and therefore the speaker cone is made to move together with the stylus as the latter moves on a gramophone record. Hence, in such arrangement the mechanism is made more complex and due to the movability of the speaker cone, it incurs more chances of breakdowns. And, also the difficulty of obtaining a constant amount of the contact pressure between the stylus and the sound disc is caused by the vibration of the moving speaker and other disturbance resulting therefrom.

The present invention provides a gramophone device for incorporation in a toy, said device comprising a rotatably mounted sound disc, a pick up arm incorporating a stylus and mounted for pivoting movement across the face of the sound disc so that the stylus can follow a sound groove cut in said disc, and a speaker cone mounted above the pick up arm and fixed with respect to the path of movement of the latter, the pick up arm having a transversely extending platform in

the region of the stylus for making sliding contact with the apex of the speaker cone during movement of the arm across the sound disc, in order to transmit sound vibrations from the stylus to the speaker cone, and the sound disc being axially spring urged in a direction towards the speaker cone in order to maintain firm contact between the said platform and the speaker cone. In this device, the speaker cone is thus separated from the stylus and is kept in contact with the stylus by way of the said platform, so that there is no occurrence of such breakdowns as are caused by the movability of the speaker cone, and the desirable contact pressure can be easily maintained.

The invention is illustrated by way of example in the accompanying drawing, in which:

Fig. 1 is a plan view of a gramophone device;

Fig. 2 is a longitudinally sectioned side view of the device shown in Fig. 1; and

Fig. 3 is a bottom view of the same.

Referring to the drawing, an upper frame 2 is fixed to a base frame 1, and there-between a sound disc 3 is rotatably mounted on a turntable 4 which is fitted on a spindle 17 and normally urged upwards by a spring 8. A belt 5 is wound around the periphery of the turntable 4 and connected to the driving shaft of a motor 6 mounted in the base frame 1. A pick up arm 11 is mounted on the upper end of a pivot pin 10 extending upright from the base frame 1, and is arranged to pivot about the pin 10 in a plane parallel to the disc 3. The arm 11 is provided at the free end with a platform 12 extending transversely in a shape of an arc having its centre of curvature at the pivot 10, and a stylus 9 is fixed to the underside of the arcuate platform 12. The apex of a speaker cone 13 is arranged to contact the arcuate platform 12 of the arm

11, and a spring 14 is provided on the arm 11 for urging it counter to the running direction of the stylus 9 as the sound disc 3 rotates. Near the central portion of the sound disc 3, there is provided a hole 15 into which the stylus 9 can drop as it reaches the central end of the sound groove. There is also provided a pivoted lever arm 16 for pressing down the spindle 17 of the turntable 4 against the action of the spring 8 when the stylus 9 falls in the hole 15.

In the drawing, the numeral 18 denotes a hairpin spring for normally urging the lever arm 16 into its upward position above the head of the pivot 17, and 19 denotes a spare hole for installing the pivot 10 for the pick up arm 11 when the convolution of the sound groove on the sound disc 3 is cut in the opposite direction. 20 is a switch bar for opening and closing a contact point 21 provided thereon. This bar 20 includes a humped portion 22, which is designed to lift and support the pivot 17 when the contact point 21 is swung to open, so that the turntable 4 and the sound disc 3 become pressed tightly against the upper frame 2 in order to prevent any possible breakdown of the apparatus during shipping and transport. 23 indicates an aperture in the upper frame 2 through which the stylus 9 can penetrate to engage the disc 3.

The operation of the device is as follows; when the electricity is supplied to the motor 6 to actuate the same, the belt 5 rotates the turntable 4, the stylus 9 transmits the imparted sound vibrations to the apex of the speaker cone 13 to generate musical sounds, and as the stylus 9 travels along the sound groove on the sound disc 3 towards the central portion where the sound groove terminates, the arcuate platform 12 undergoes an arcuate motion centred on the pivot 10 making positive sliding engagement with the apex of the speaker cone 13 so that satisfactory reproduction of the gramophone record is maintained. Contact pressure of the stylus 9 with the sound disc 3 and of the platform 12 with the speaker cone 13 is maintained by the spring 8.

When the musical performance is completed and the stylus reaches the end of the sound groove, it drops into the hole 15 cut through the sound disc in the central portion thereof. Upon depression of the lever arm 16 to lower the spindle 17, the turntable 4 and the sound disc 3 are lowered against the action of the spring 8 to free the stylus from the hole 15

and enable the arm 11 to return to its starting position for the next music performance under the action of the spring 14. This returning operation of the arm 11 can be effected simply by pressing down the lever arm 16 without stopping the revolution of the motor 6, and the musical playing of the gramophone record accommodated within the body of the desired toy such as a doll can easily be repeatedly performed. Thus, the device of the present invention is well suited for a gramophone toy.

WHAT WE CLAIM IS:—

1. A gramophone device for incorporation in a toy, said device comprising a rotatably mounted sound disc, a pick up arm incorporating a stylus and mounted for pivoting movement across the face of the sound disc so that the stylus can follow a sound groove cut in said disc, and a speaker cone mounted above the pick up arm and fixed with respect to the path of movement of the latter, the pick up arm having a transversely extending platform in the region of the stylus for making sliding contact with the apex of the speaker cone during movement of the arm across the sound disc, in order to transmit sound vibrations from the stylus to the speaker cone, and the sound disc being axially spring urged in a direction towards the speaker cone in order to maintain firm contact between the said platform and the speaker cone.

2. A device as claimed in claim 1, in which the sound disc is provided with a hole at the central end of the sound groove, for penetration by the stylus.

3. A device as claimed in claim 2, in which the pick up arm is spring urged towards the outer periphery of the sound disc, means being provided for moving the sound disc axially against its spring loading in order to free the stylus from said aperture and allow the arm to return to the outer periphery of the sound disc.

4. A device as claimed in claim 3, in which the said means comprises a pivoted lever arm arranged to make pressure contact with a spindle to which the sound disc is fixed.

5. A gramophone device for incorporation in a toy, substantially as described herein with reference to the accompanying drawing.

ABEL & IMRAY,
Chartered Patent Agents,
Quality House, Quality Court,
Chancery Lane, London, W.C.2.



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and enable the arm 11 to return to its starting position for the next music performance under the action of the spring 14. This returning operation of the arm 11 can be effected simply by pressing down the lever arm 16 without stopping the revolution of the motor 6, and the musical playing of the gramophone record accommodated within the body of the desired toy such as a doll can easily be repeatedly performed. Thus, the device of the present invention is well suited for a gramophone toy.

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