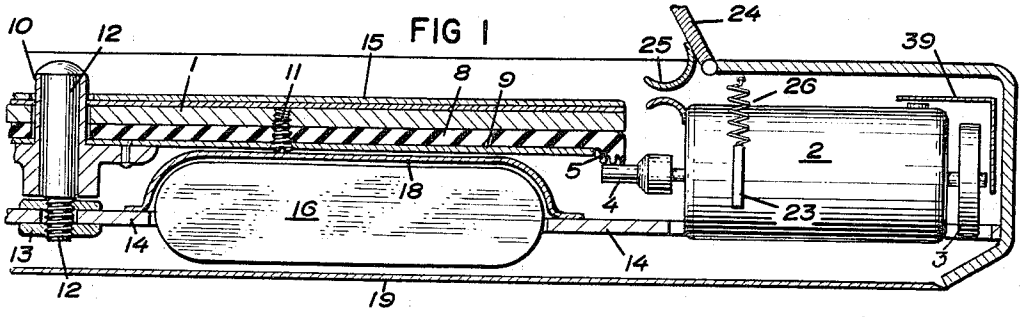
Nov. 16, 1965 A. GENTILINI 3,218,081

PORTABLE LIGHTWEIGHT RECORD-PLAYER

Filed May 26, 1960 2 Sheets-Sheet 1

FIG 1



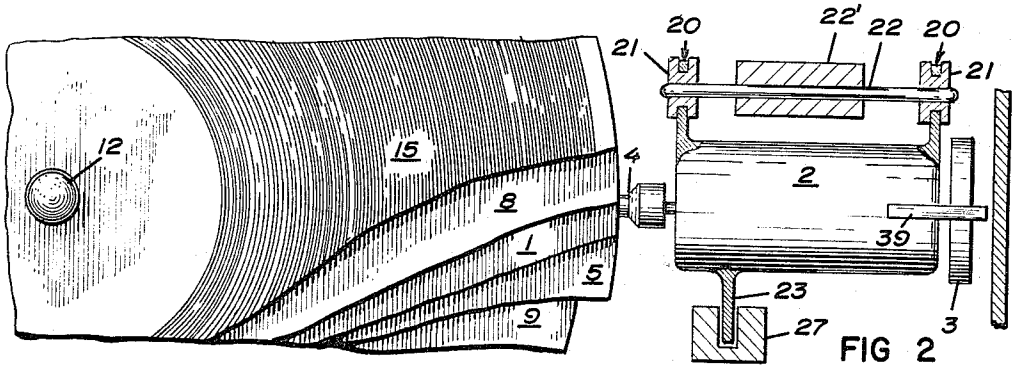


FIG 2

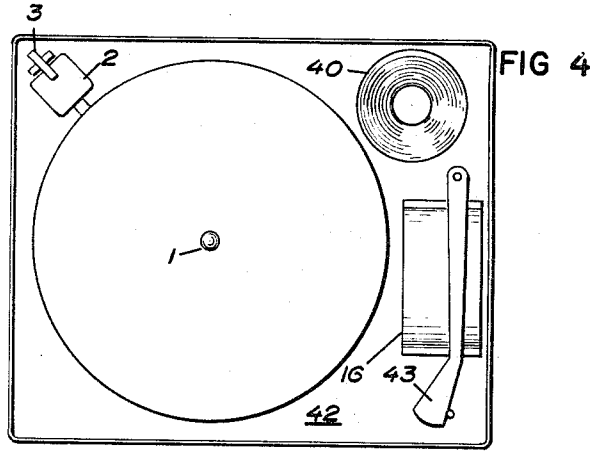


FIG 4

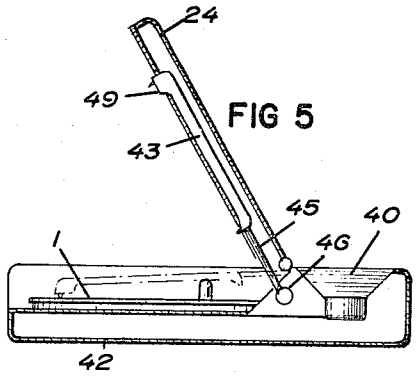


FIG 5

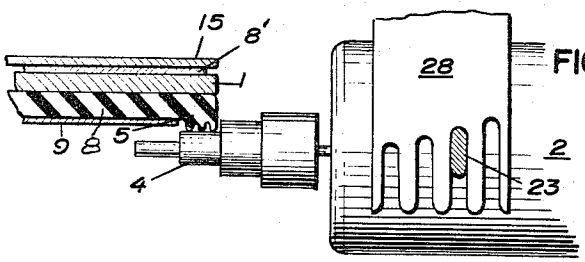


FIG 3

Augusto Gentilini
INVENTOR

BY Wenderoth, Lind & Ponack
ATTORNEYS

Nov. 16, 1965 A. GENTILINI 3,218,081

PORTABLE LIGHTWEIGHT RECORD-PLAYER

Filed May 26, 1960 2 Sheets-Sheet 2

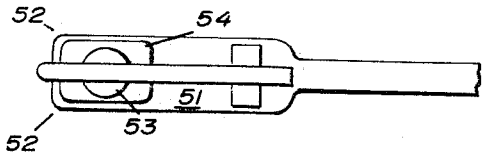
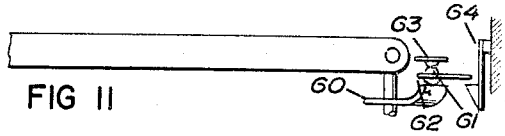


FIG 11



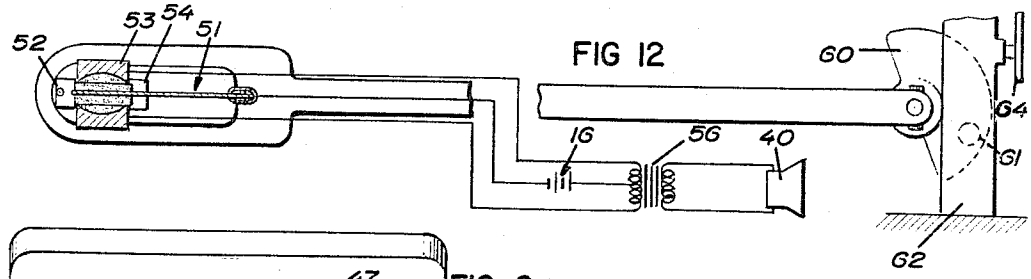


FIG 12

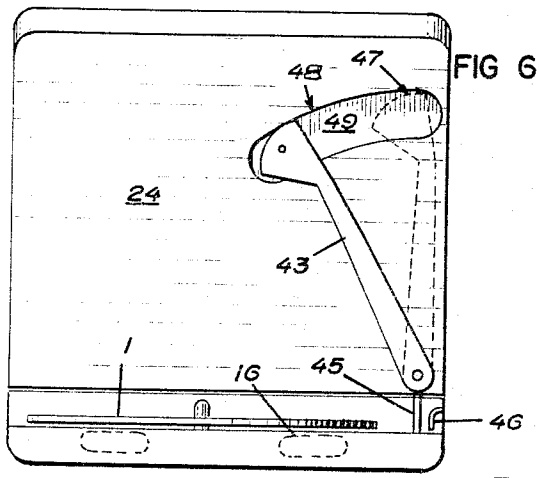


FIG 6

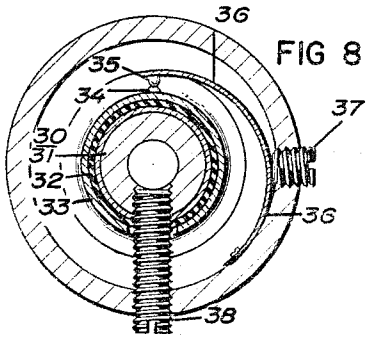


FIG 8

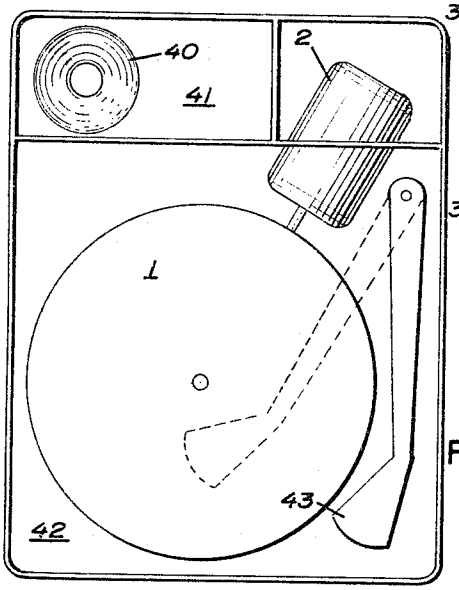


FIG 7

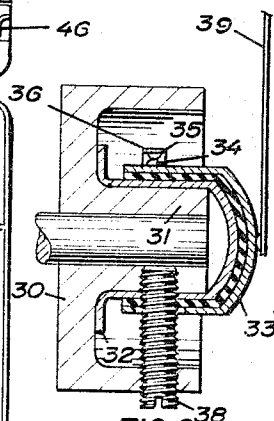


FIG 9

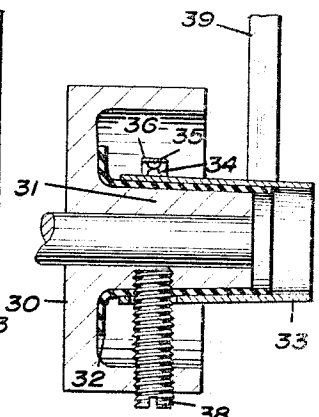


FIG 10

Augusto Gentilini

INVENTOR

BY Wenderoth, Lind & Ponack

ATTORNEYS

United States Patent Office

3,218,081

Patented Nov. 16, 1965

3,218,081

PORTABLE LIGHTWEIGHT RECORD-PLAYER

Augusto Gentilini, 36 Via dei Mille, Rome, Italy

Filed May 26, 1960, Ser. No. 32,040
9 Claims. (Cl. 274—39)

It is the object of this invention to embody a record-player in which the various devices, and especially those to avoid vibrations of the motor, do not cause a notable increase of weight and size, with a special view towards the possibility of employing records for didactic and similar purposes: the invention, in fact, tends also to reduce the dimensions vertically, so that the closed apparatus will have a volume and weight similar to a book of medium size. This reduction in size is possible mainly because the motor is installed with the axle parallel to the plane of the record, thus eliminating the normal anti-vibrant gear, and because of further improvements described hereunder.

The above-mentioned and other features and objects of this invention will become more apparent by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a vertical section of the turntable and its coupling with the motor;

FIG. 2 is a horizontal cross section of this coupling means;

FIG. 3 shows the possible application of a speed gear;

FIG. 4 is a diagram, in cross section, of a simplified embodiment of the apparatus;

FIGS. 5, 6, 7 are seen from a lateral, frontal and perspective view of the apparatus described hereunder;

FIGS. 8 and 9 show an enlargement of the front and side of the speed-controlling device;

FIG. 10 shows a construction variant thereof; and

FIGS. 11 and 12 show a diagrammatic lateral and perspective view of the pick-up arm according to a simplified embodiment of this invention.

The turntable **1** of the record-player (FIGS. 1 and 2) is driven directly by the motor **2**, which has a regulator operated by centrifugal force **3**. The motor contacts with the end of the shaft **4** a toothed rim **5** projecting from the turntable **1**, and the toothed rim is of resilient material as synthetic rubber or similar material. The toothed rim may suitably be located on the outer part of a rubber plate **8** between two metal plates **1** and **9**, of which **9** is firmly joined with the central hub **10** while the turntable **1** may simply rest on the rubber plate **8** or it may be fixed thereon by screws **11** which are firmly attached to plate **9**. The hub **10** rotates around a pivot **12** which is tightened, for example, by a couple of nuts **13**, on the base **14** of the apparatus. The outer diameter of the hub **10** corresponds on top to the hole in the metal plates **1** and **9**, in the rubber one **8** of an intermediate layer **8'**, and of the phonographic record **15**.

In an apparatus for limited purposes (not shown), built according to the present invention, it might be sufficient for the partial elimination of the vibrations, to fasten the motor to a suspended rubber plate, and the construction of the turntable by a single plate, carrying at its periphery a housing for a rubber washer, which projects underneath the base of the record in order to be driven by a horizontal shaft motor.

Underneath the group of plates described above, which forms the turntable, the space is used for housing of the batteries **16**, which are protected on top by a metal shell **18**, underneath which there is an opening bottom **19** and laterally windows in the plate **14**.

The motor **2** is supported by two arms **20** on bearings **21** of soft rubber or similar material, preferably with the pivot **22** disposed so as to easily permit the necessary removal in order to make a contact between the shaft **4** and the toothed rim **5** or to remove it when the apparatus is in resting position in order to avoid permanent deformation of said toothed rim. The lid **24** of the apparatus presents a projection **25** to push the motor downward when said lid is closed, overcoming the action of the antagonistic spring **26** or rather of the resilient bearing **27**, connected with the third arm **23** of the motor. The motor can also be removed from the pick-up arm **43** entering into resting position, or from another member of the apparatus, not shown.

The arm of the motor **23** can also be predisposed for guiding by means of an especially shaped element **28** (FIG. 3) in order to force the motor into a different position according to the desired speed, the shaft being shaped with various diameters according to prior art.

The regulator **3** operated by centrifugal force, seen enlarged in FIGS. 8, 9, 10 consists in a small plate **30** with a cylindrical upwardly curved edge and hub **31** onto which, by means of an insulating layer **32** is fastened the adjusting sleeve **33** which has a contact intended to touch or not to touch the corresponding contact **35** of the lamina **36** mounted on the cylindrical edge of the small plate **30** and adjustable by screw **37**. The small plate is fastened to a shaft of the motor by means of a set screw **38**. In this way, one of the poles of the motor, being connected with the earth, i.e. with the small plate and with the lamina **36**, is connected or not with the feeding current deriving from the lamina **39**, according to whether the centrifugal force is insufficient to lift the lamina **36** or sufficient to do so. In order to be able to use an electric motor with an axle on only one side, a form of adjuster as indicated in FIG. 10 will be required in which the adjusting sleeve is open and permits the passing of the shaft while the contact lamina is disposed laterally and can have the shape of a common motor "brush." The small plate **20** can be prolonged at the side opposite the contact and form the shaft **4** which makes contact with the toothed rim **5**, i.e. shaft and adjuster can form a single member not represented in the figure. The hereabove described adjuster can be supplied with apertures to reduce the weight, not represented in the figure, disposed in such a way to produce a satisfactory static and dynamic balance.

Eventual and residual vibrations will not be transmitted to the body of the apparatus, because of the effect of the already described resilient suspension which, in turn, can be integrated by an antivibratory support, not represented in the figure, of the pivot **22**. In order to avoid, however, that the motor itself vibrates freely and thus transmits to the toothed rim **5** a non-uniform motion, the present invention foresees the use of an adjustable weight **22'** (FIG. 2), and of fixed balance weights varyingly disposed on the arms **20** and **23** as well as on the motor, balance weights (not represented in the figure), as their position, shape and weight, depend on the characteristics of the motor: the object of said fixed and mobile balance weights is, according to the invention, to localize the vibrations in the furthest points from the pivot-toothed rim, using resonance phenomena in order to form a stationary wave of mechanical vibration, the loop of which is far away from the above-mentioned contact point which has to correspond with the node of said wave.

The assembly of the apparatus (FIGURES 4, 5, 6, 7) is formed in such a way as to fully use the space: besides the already described members, in the figures there can be noted the loudspeaker **40**, the amplifier **41**, the outer housing **42** and the pickup arm **43**. In FIGURES 5 and 6 the lid **24** is visible which is preferably equipped with a double bottom and contains the pick-up arm **43**, which, with its prolongation **45** touches the shoulder **46**

when the lid is being lifted and is forced to return to the initial position 47 which returns gradually during functioning to its final position 48; only the extreme end of the arm with the needle, projects from the slot 49. According to the type of the apparatus, its functioning with complete return to zero can be foreseen, i.e. in rest position outside the record, when the lid is closed, or rather obtain this displacement by a special maneuver. In a simpler case the mobile support device of the arm is independent from the lid and is directly connected with the motor group and with the amplification in order to make the maneuver automatic in the known manner, as indicated in FIGURES 11 and 12 where, for reasons of simplicity, the arm is represented straight without the necessary angle of tangency. In order to start the apparatus, the cam 60 (pushing its prominence 61) with its inclined part lifts the lamina 62 which serves both to operate the contact 63 and to lift the motor by a prolongation not shown in the figure. During operation the position of the motor and the contact is maintained by a hook 64, which will be opened at the end of the record at the plane and projecting part of the cam 60. In the same FIGURES 11 and 12 a simplified embodiment of a pick-up arm is shown as an example for apparatus at a reduced price, according to the present invention, formed essentially by a central lamina 51 which carries one or several needles 52 and can move between two hollow contact members in carbon 53, filled with carbon dust; all of this enclosed in a small block 54 of very flexible material suitable to retain the dust, permitting the movement of the lamina; so as to form a microphone of carbon of double effect, connectable, to a battery 16 and balanced transformer 56, with the loudspeaker 40 without the necessity of amplification.

I have thus described my invention, but I desire it understood that it is not confined to the particular forms or uses shown and described, the same being merely illustrative, and that the invention may be carried out in other ways without departing from the spirit of my invention.

What I claim is:

1. A portable record player comprising a turntable, said turntable comprising two metal plates, a plate of resilient and flexible material interposed between said metal plates, said resilient plate having a toothed rim, a rotating hub upon which said plates are mounted, a motor disposed with its shaft parallel to said plates, and means upon said shaft coacting with said toothed rim.

2. A record player as set forth in claim 1 wherein said motor is mounted upon a plurality of arms fixed to said motor in assymetric position.

3. A portable record player as set forth in claim 2 wherein said arms are supported by rubber bearings on a pivot at one side and on the other side by a resilient support.

4. A record player as set forth in claim 2 wherein said mounting of said motor may be shifted transversely and longitudinally so that the connection between said toothed rim and said motor may be varied to provide different speeds.

5. A record player as set forth in claim 2 wherein a centrifugal regulator is associated with said motor.

6. A record player as set forth in claim 5 wherein said regulator comprises a cylindrical plate.

7. A record player as set forth in claim 5 wherein said regulator is provided with an insulating sleeve open at both ends to allow for its mounting upon said motor shaft.

8. A record player as set forth in claim 5 wherein a housing is provided beneath the turntable for battries to operate said motor.

9. A portable record player comprising a turntable, said turntable comprising two metal plates, a plate of resilient and flexible material interposed between said metal plates, said resilient plate having a toothed rim, a rotating hub upon which said plates are mounted, a motor disposed with its shaft parallel to said plates, means upon said shaft coacting with said toothed rim, a plurality of arms fixed to said motor in assymetric position upon which said motor is mounted and balance weights mounted on said arms.

References Cited by the Examiner

UNITED STATES PATENTS

1,656,424	1/1928	Cover	179—100.41
1,820,154	8/1931	Peets	274—1.5
1,979,350	11/1934	Schmittgen	274—39
2,475,744	7/1949	Harman	274—14
2,505,264	4/1950	Van der Woude	274—39
2,590,439	3/1952	McKnight	179—100.41
2,899,515	8/1959	Schuler	200—80
2,945,101	7/1960	Chichester	200—80
2,961,242	11/1960	Zimmerman	274—14

FOREIGN PATENTS

1,033,863	7/1953	France.
1,090,720	4/1955	France.

NORTON ANSHER, *Primary Examiner.*

STEPHEN W. CAPELLI, E. J. SAX, *Examiners.*