# United States Patent [19]

**Laurent**

[11] **3,850,070**

[45] **Nov. 26, 1974**


[54] **MUSIC BOX**


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[22] Filed: **Apr. 22, 1974**

[21] Appl. No.: **463,188**

[30] **Foreign Application Priority Data**

June 15, 1973 Switzerland ..... 8692/73

[52] **U.S. Cl.** ..... **84/95**

[51] **Int. Cl.** ..... **G10f 1/06**

[58] **Field of Search** ..... 84/94–96



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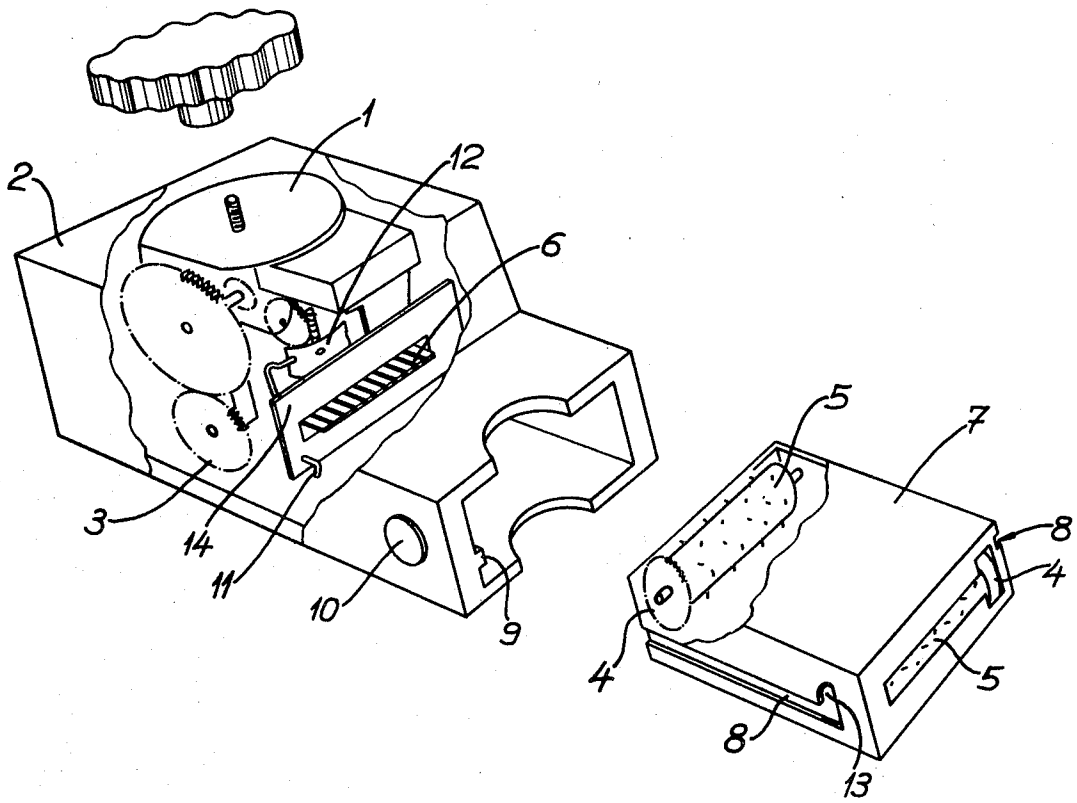
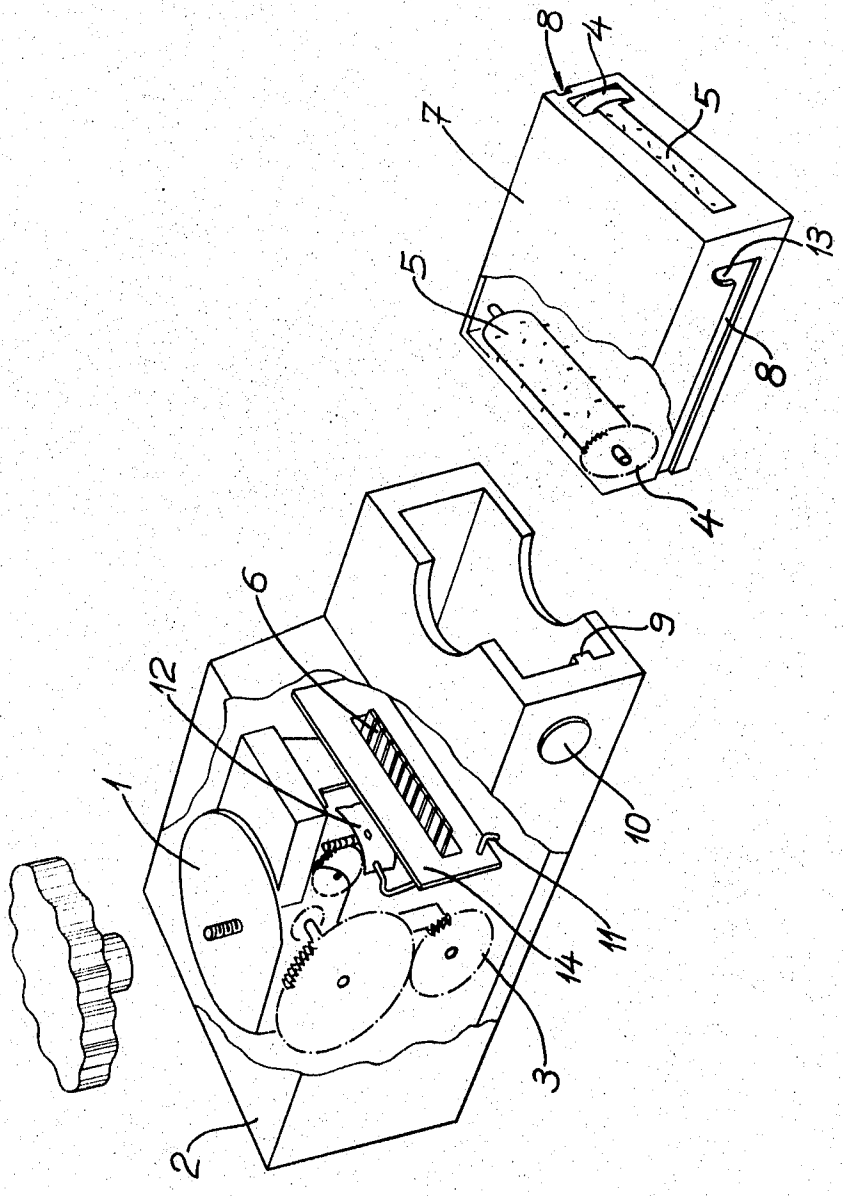
[57] **ABSTRACT**

A cassette music box comprises a base housing a motor with a gear train, and a comb-like plate with tuned teeth. A cassette removably fittable in a recess of the base includes a pin roller and a driving wheel which respectively engage with said teeth and the gear train when the cassette is fitted.


**5 Claims, 1 Drawing Figure**

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# MUSIC BOX

The invention relates to music boxes of the type in which a roller, or a belt passing around rollers, carries a plurality of asperities, e.g., pins, which act on tuned teeth of a comb-like plate.

In known antique music boxes, the tune may be changed by changing the roller by an axial sliding movement. However, in these types, the comb-like plates are complicated and expensive to manufacture.

In other known music boxes, it is possible to change the tune by inserting a cartridge containing a roller and a comb-like plate into the music box which itself houses a motor for driving the roller. These types are, however, relatively expensive.

An object of the invention is to provide a cassette music box which avoids these drawbacks. This cassette music box comprises a case or base including a motor, a gear-train operatively connected to the motor, and a comb-like plate with a plurality of tuned teeth. A recess is provided in the case to receive a cassette having a hollow body of corresponding shape. A roller member carrying a plurality of selectively disposed asperities is rotatably mounted in the cassette body, with said asperities and a wheel fixed for rotation with the roller member being accessible through an opening in the cassette body. Means are provided for releasably holding said cassette in said recess in a position in which (a) said gear train is in driving engagement with said wheel and (b) said asperities are disposed to operatively cooperate with said teeth upon rotation of said member.

In this context, the term "roller member" designates both a roller carrying asperities, and a roller about which an endless belt carrying the asperities passes.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying schematic drawings, the single FIGURE of which is a partly cut-away view of a music box and cassette according to the invention.

The music box shown comprises a hollow case or base **2** in which a substantially constant speed clockwork or battery-operated electric motor **1** is mounted. Motor **2** drives a gear train including a toothed wheel **3** which is adapted, in use, to drive a toothed wheel **4** fixed to a pin roller **5.** Case **2** also houses a comb-like steel plate including a plurality of tuned teeth **6.**

Two pin rollers **5** and wheels **4** are mounted in a removable cassette with a body of rectangular parallelepipedic shape having two major faces and four minor edges. T-shaped openings **15** provided in facing edges of the cassette body enable the wheels **4** to be accessible for meshing with wheel **3** and the asperities **5** accessible for operative cooperation with teeth **6.**

The other edges of the cassette body are each provided with an elongate groove **8** terminating with an enlarged end **13.** These grooves **8** are so disposed that by cooperation with a rail-forming protuberance in the recess of body **2** adapted to receive cassette **7,** the cassette **7** can be introduced in said recess with a sliding movement in a direction perpendicular to the face of an opening **15,** but only for a given orientation of the cassette in which wheel **4** will come to mesh with wheel **3.** When the cassette is fully pushed in, it is held in position by means of a manually releasable detent **10** which engages in an end **13** of groove **8.**



The music box also comprises a device **12** for locking the gear train and hence stopping motor **1.** Device **12** is associated with a control member **11** which is spring biased to a locking position in which it protrudes in the cassette-receiving recess. When a cassette **7** is fitted in the recess, the cassette body moves the control member to and holds it in an unlocking position in which the motor **1** is freed, whereby wheel **3** drives wheel **4** and roller **5.**

The music box also includes means for protecting the comb-like plate, formed by a magnetized plate **14** disposed lengthwise of the comb-like plate and having a slot through which teeth **6** pass. Should a tooth **6** be accidentally broken, the broken-off tooth will be magnetically held on plate **14,** so that the risk of jamming the motor **1** will be reduced.

With the described music box, it is possible to change the tune by inserting different cassettes or by turning around a cassette, this being achieved with a single motor and a single comb-like plate.

The cassettes could have only a single roller, or more than two rollers, for example, four rollers protruding through openings in four edges of the cassette. Alternatively, a pair of rollers could carry an endless belt carrying asperities, enabling longer tunes to be played.

The case or base **1** could have different shapes and the cassettes could be inserted in recesses with a different disposition.

What is claimed is:

**1.** A cassette music box comprising, in combination: a case including a motor, a gear train operatively connected to the motor, a comb-like plate with a plurality of tuned teeth, and means defining a recess in the case for receiving a cassette; and at least one cassette, said cassette including hollow cassette body adapted to fit in said recess of the case, at least one roller-like member rotatably mounted in said body, a plurality of asperities selectively disposed on said member, a wheel fixed for rotation with said member, and means for defining at least one opening in said body through which said asperities and said wheel are accessible; said combination further comprising means for releasably holding said cassette in said recess in a position in which (a) said gear train is in driving engagement with said wheel and (b) said asperities are disposed to operatively cooperate with said teeth upon rotation of said member.

**2.** A cassette music box according to claim **1,** in which said cassette body is of generally rectangular parallelepipedic shape comprising two major faces and four minor edges, said at least one opening being provided in a first one of said minor edges, the roller-like member being pivotally mounted in opposite second and third of said minor edges adjacent said first minor edge, said recess and said cassette body including complementary means defining a rail for guiding said cassette body into and out of said recess with a sliding movement in a direction perpendicular to said first face.

**3.** A cassette music box according to claim **2,** comprising means for defining at least one further opening in the fourth edge of said cassette body, a second roller-like member provided with a wheel and carrying selectively disposed asperities being pivotally mounted in said second and third edges adjacent to said fourth edge, and said guiding means including a protuberance in said recess and means defining an elongate groove along each of the second and third edges of said hous-

ing, said grooves being disposed to cooperate with said protuberance only for a given orientation of the cassette body relative to the case.

**4.** A cassette music box according to claim **1**, in which said case includes means for locking said gear train and said motor, said locking means including a control member movable between a locking position in which it protrudes in said recess and an unlocking position, and means for biasing said member towards said



locking position, said cassette body being adapted to hold said member in the unlocking position when the cassette is fixed in said recess in said position.

**5.** A cassette music box according to claim **1**, in which said comb-like plate is in steel and said case includes means for protecting said comb-like plate, said protecting means including a magnet extending lengthwise of said comb-like member.

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