

[72] Inventors **Edwin O. Stastny**
Santa Ana;
Lester T. Stormon, Redondo Beach; Anson
Sims, Manhattan Beach, Calif.
 [21] Appl. No. **873,742**
 [22] Filed **Nov. 26, 1969**
 [45] Patented **May 25, 1971**
 [73] Assignee **Mattel, Inc.**
Hawthorne, Calif.
Continuation of application Ser. No.
716,543, Mar. 27, 1968, now abandoned.

2,546,680	3/1951	Samuals	274/11X
2,560,254	7/1951	Shickel	274/11(E)X
3,450,239	6/1969	Ryan	274/1(.1)X
3,466,050	9/1969	Sindlinger	274/1(.1)
3,220,143	11/1965	Van Den Hurk	274/1.1
3,285,612	11/1966	Hallamore	274/4
3,410,564	11/1968	Duncan et al.	274/1.1
2,546,680	3/1951	Samuals	33/211

FOREIGN PATENTS

477,736	1938	Great Britain	274/11E
---------	------	---------------------	---------

Primary Examiner—Leonard Forman
Assistant Examiner—Dennis A. Dearing
Attorney—Seymour A. Scholnick

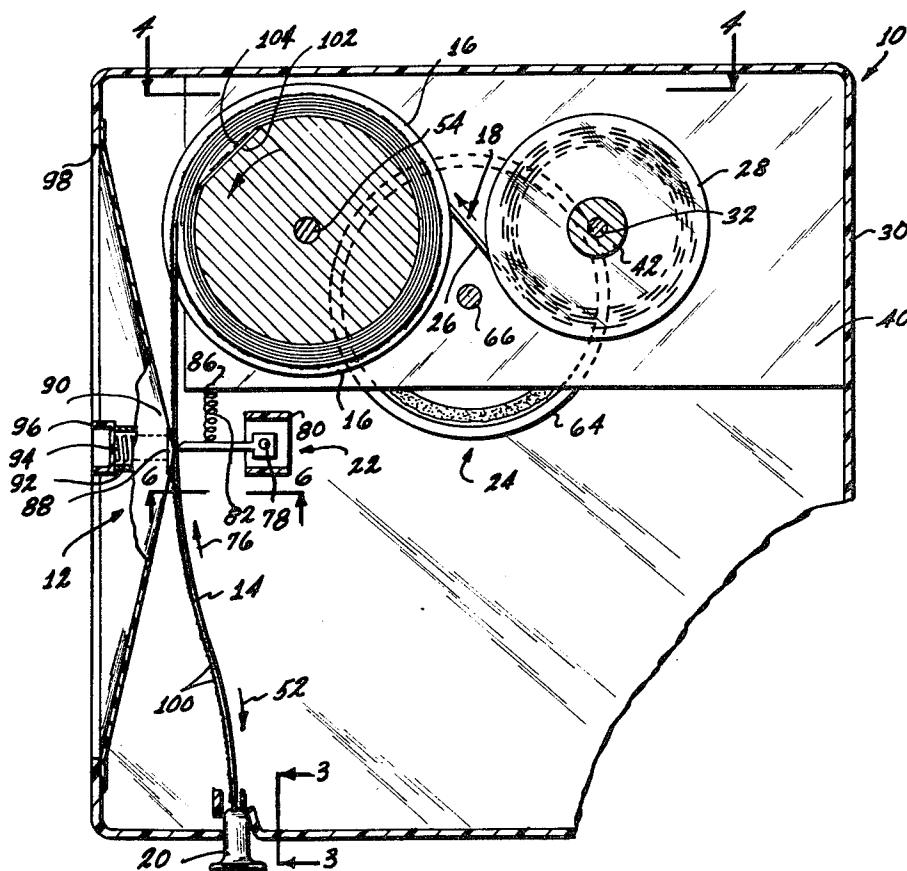
[54] **DEVICE FOR REPRODUCING SOUNDS IN TOYS**
 3 Claims, 7 Drawing Figs.

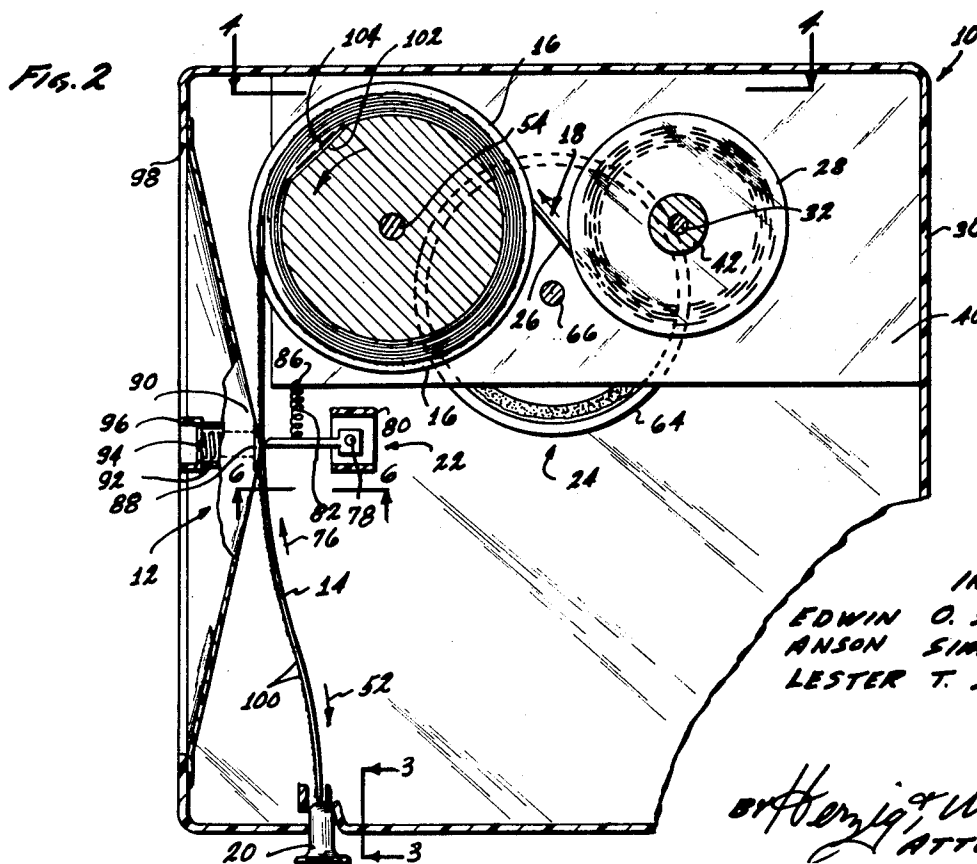
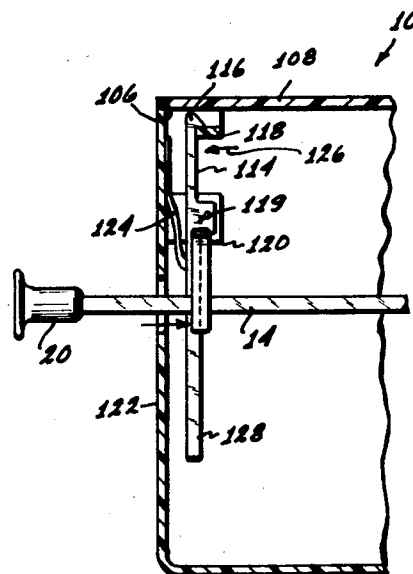
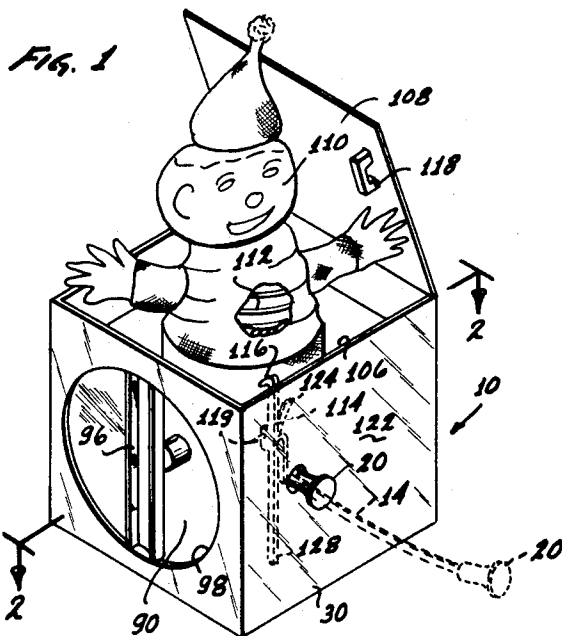
[52] U.S. Cl. 274/1A,
 46/118, 274/11R
 [51] Int. Cl. G11b 3/00
 [50] Field of Search. 274/11, 4,
 11 (E), 11.12, 1.1

[56] **References Cited**
UNITED STATES PATENTS
 2,287,377 6/1942 Gallier

274/11

ABSTRACT: A sound-producing tape is wound on a reel having a spring-driven rewind. As the tape is pulled from the reel past a sound reproducer and a pivoted finger, the finger is pivoted due to its frictional engagement with the tape allowing the tape to inoperatively pass the sound reproducer. Upon release, the tape is automatically rewound onto the reel and is brought into operative association with the sound reproducer by the pivoted finger so that sounds are reproduced only during the rewinding operation.

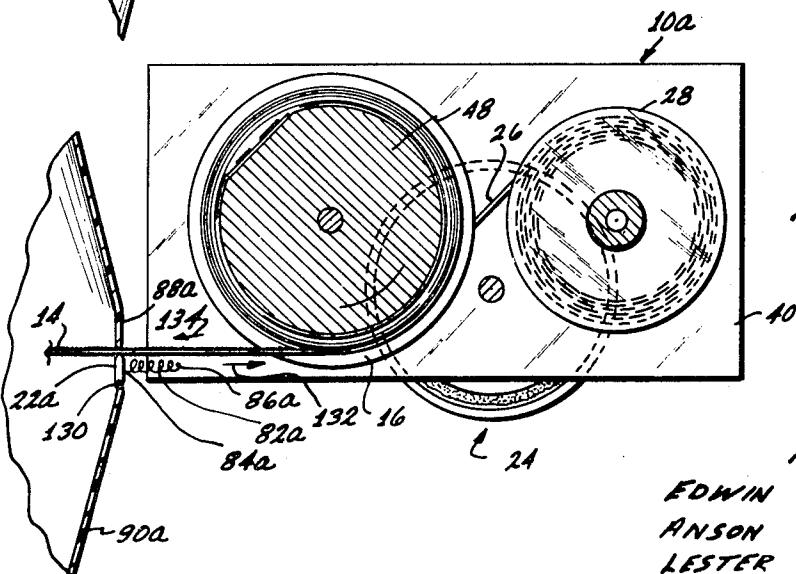
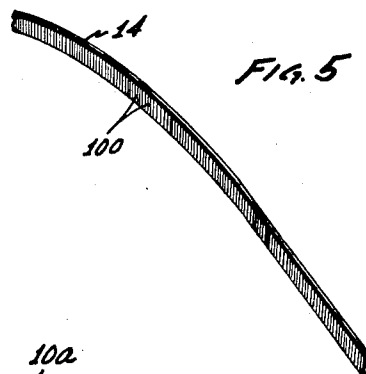
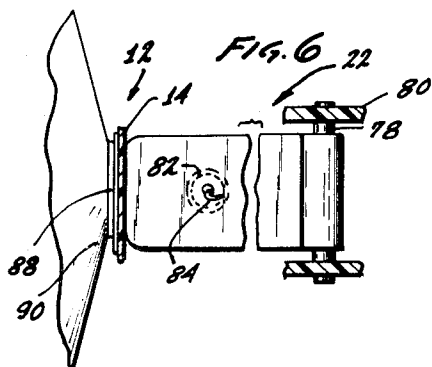
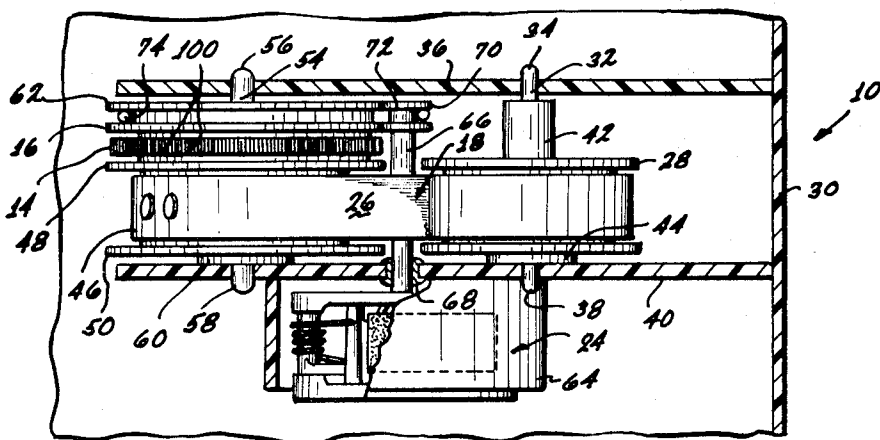




INVENTORS
EDWIN O. STASTNY
ANSON SIMS
LESTER T. STORMAN

Ortiz, H. & Walsh
ATTORNEYS

FIG. 4



INVENTORS
EDWIN O. STASTNY
ANSON SIMS
LESTER T. STORMON

BY *Herbert Walsh*
ATTORNEYS

DEVICE FOR REPRODUCING SOUNDS IN TOYS

This is a continuation of application Ser. No. 716,543 filed Mar. 27, 1968, and now abandoned.

BACKGROUND OF THE INVENTION

The background of the invention will be set forth in two parts.

1. Field of the Invention

The present invention pertains generally to the field of devices for reproducing recorded sounds in toys and more particularly to such a device having information recorded on a tape wound on a reel having a spring-driven rewind and including means for reproducing the recorded information during rewinding of the tape onto the reel.

2. Description of the Prior Art

Devices are known wherein a sound-producing tape is wound on a reel having a spring-driven rewind. The information recorded on the tape may be reproduced by pulling the tape from the reel past a sound reproducer.

One disadvantage with such devices resides in the fact that faithful reproduction of the recorded information is rather difficult to obtain because of the lack of control of the speed at which the tape is withdrawn from the reel.

SUMMARY OF THE INVENTION

In view of the foregoing factors and conditions characteristic of devices for reproducing recorded sounds in toys, it is a primary object of the present invention to provide a new improved device of this type not subject to the disadvantage enumerated above and including means for reproducing information recorded on a sound-producing tape during the rewinding thereof onto a reel.

Another object of the present invention is to provide a device of the type described including governor means for controlling the rewinding speed of a sound-producing tape on a reel.

A further object of the present invention is to provide a device of the type described which includes a sound-producing tape having means provided thereon for actuating an animating means in a figure toy at the end of the playing of the recorded information.

According to the present invention a simple, inexpensive sound-producing toy of the type having sound-reproducing means, a sound-producing tape wound on a reel and spring means connected to the reel for rewinding the tape onto the reel when the tape is released after first being pulled from the reel includes the improvement of means connected to the sound-reproducing means for bringing the tape into operative association or playing engagement with the sound-reproducing means only during rewinding of the tape onto the reel. Governor means are connected to the reel for controlling the rate at which the tape is rewound onto the reel.

The housing for the reel and the sound-reproducing means is shown herein for purposes of illustration but not of limitation, as comprising a housing for a jack-in-the-box which is actuated automatically at the end of the playing of the tape by the engagement of a pull knob on the tape with latch means which releases the lid on the housing.

The features of the present invention which are believed to be novel are set forth with particularity in the claims. The present invention both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, which like reference characters refer to like elements in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a device for reproducing recorded sound in toys constituting a first embodiment of the present invention;

FIG. 2 is an enlarged, partial cross-sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is an enlarged, partial cross-sectional view taken along line 3-3 of FIG. 2

FIG. 4 is a partial, cross-sectional view taken along line 4-4 of FIG. 2;

FIG. 5 is an enlarged, partial perspective view of a sound-producing tape used in the device of FIG. 1;

FIG. 6 is an enlarged, partial cross-sectional view taken along line 6-6 of FIG. 2; and

FIG. 7 is a partial, cross-sectional view similar to FIG. 2, but showing a device constituting a second embodiment of the present invention.

The various arrows in the drawings indicate the direction of motion of the surfaces or elements near which they are placed.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring again to the drawings, and more particularly to FIGS. 2 and 4, a device constituting a first embodiment of the present invention, generally designated 10, includes a sound-reproducing means 12 into operative association with which a sound-producing tape 14 is automatically brought during the rewinding thereof onto a reel 16 by a spring means 18 after tape 14 has first been pulled therefrom by a pull knob 20.

The device 10 also includes finger means 22 which brings tape 14 into operative association with the sound-reproducing means 12 only during rewinding of tape 14 onto reel 16 so that tape 14 actuates sound-reproducing means 12 only during rewinding of tape 14 onto reel 16. The rate of travel of tape 14 during this rewinding operation affects the quality of sound produced by tape 14 and sound-reproducing means 12. This rate of travel may be controlled, for the most part, by selecting a spring 18 of the constant-force type. If finer control is desired, a governor means 24 may be employed.

Spring means 18 is shown herein for purpose of illustration, but not of limitation, as comprising a constant-force spring 26 normally biased to wind itself on a takeup drum means 28 rotatably mounted in a housing 30 on an axle 32 having a first end 34 journaled in a first horizontal partition 36 provided in housing 30 and a second end 38 journaled in a second partition 40 provided in housing 30. A pair of spacers 42, 44 maintain drum means 28 in position between partitions 36 and 40. Spring 26 includes an end 46 affixed to a power drum 48 by a pair of fastening means 50 in such a manner that spring 26 will be wound into power drum 48 against the normal bias in spring 26 when tape 14 is pulled in the direction of arrow 52 (FIG. 2) to unwind it from reel 16. This stores energy in spring 26 so that, when tape 14 is released, this stored energy rotates drum 48 transferring spring 26 back to drum means 28 and rewinding tape 14 on reel 16. Power drum means 48 is rotatably mounted in housing 30 by an axle 54 having a first end 56 journaled in partition 36 and a second end 58 journaled in partition 40. A spacer 60 and a belt pulley 62 maintain power drum means 48 in a proper position between partitions 36 and 40.

Governor 24 may be one of the well-known types employed in toy phonographs, such as the one shown in U.S. Pat. No. 3,245,688 and is rotatably mounted in a governor housing 64 by a shaft 66 journaled in a bearing 68 provided in partition 40. Shaft 66 includes an end 72 which carries a belt pulley 70 about which a belt 74 is trained. Belt 74 is also trained about pulley 62, which, in turn, is formed integrally with reel 16 and power drum means 48 so that governor 24 will control the speed of drum 16 during the transfer of spring 26 back to drum means 28 from power drum means 48. This rewinds tape 14 on reel 16 at a proper speed for satisfactory reproduction of the information recorded on tape 14. This reproduction is accomplished by bringing tape 14 into operative association with sound-reproducing means 12 during this rewinding operation which moves tape 14 in the direction of arrow 76. Tape 14 is brought into operative association with sound-reproducing means 12 by finger means 22 which is swingably mounted in housing 30 on a pivot pin 78 carried by a bracket 80. A spring 82 has a first end 84 affixed to finger means 22

and a second end 86 affixed to partition 40 for pulling finger means 22 in the direction of arrow 76 forcing tape 14 into engagement with the apex portion 88 of a speaker cone 90 forming part of sound-reproducing means 12. Speaker cone 90 may be made from suitable plastic materials well known to those skilled in the art and apex 88 may be formed by a wedge-shaped piece of a suitable acetal resin derived by the polymerization of formaldehyde. Apex 88 is biased toward finger means 22 by a compression spring 92 having a first end 94 bearing against a bridge 96 extending across an aperture 98 in which speaker cone 90 is mounted. When tape 14 is pulled in the direction of arrow 52, finger means 22 is drawn in the direction of arrow 52 releasing tape 14 from operative association with apex 88 so that sound is not produced during the unwinding of tape 14 from reel 16.

It will be apparent to those skilled in the art that a suitable stop means, not shown, will be needed to limit swinging movement of finger means 22 in the direction of arrow 76 to about the position shown in FIG. 2.

Tape 14 is a strip of suitable material, preferably a plastic having sufficient strength to withstand repeated pulling thereof to transfer spring 26 from takeup drum means 28 to power drum means 48 and is provided with a plurality of transverse ridges or indentations 100. These are a form of "hill-and-dale" recording, but with the lines extending entirely across the width of tape 14, instead of being merely in a thin groove for cooperation with a stylus. Scored tapes of this type are known from U.S. Pat. Nos. 2,042,736 and 2,164,663. It will, of course, be apparent to those skilled in the art, that a thin groove and stylus may be used in place of the transverse ridges and the apex 88. Additionally, a plurality of recorded messages may be provided on tape 14 although only a single recording is shown herein for purposes of illustration, but not of limitation. Tape 14 includes an end 102 which may be affixed to reel 16 by a suitable fastening means 104.

Referring now more in particular to FIGS. 1 and 3, housing 30 includes an open end 106 which may be closed by a lid 108 swingably connected to housing 30 by a suitable hinge means (not shown). A figure toy 110 may be mounted in housing 30 on partition 36 and may be animated by a suitable spring 112 which moves figure toy 110 to the position shown in FIG. 1 when lid 108 is released. Lid 108 is normally maintained in a closed position by a latch member 114 having a hooked end 116 engageable with a bracket 118 depending from lid 108. Latch 114 is swingably mounted in housing 30 by a pivot pin 119 carried by a bracket 120 affixed to an end wall 122. Latch 114 is normally biased to the position shown in FIG. 3 by a leaf spring 124 and may be swung in the direction of arrow 126 to release lid 108 by the engagement of knob 20 with an extension 128 on latch 114 at the end of play of tape 14. Upon the release of lid 108, spring 112 forces figure toy 110 to its FIG. 1 position causing lid 108 to pop open.

Referring now to FIG. 7, a device for reproducing recorded sounds in toys constituting a second embodiment of the invention, generally designated 10a, may be identical to the device 10 except that speaker 90 is replaced by a speaker 90a having an apex 88a provided with an aperture 130 through which tape 14 passes in operative association with a finger means 22a mounted in aperture 130 and biased in the direction of

arrow 132 by a spring 82a having a first end 84a connected to finger means 22a and a second end 86a connected to partition 40. Tape 14 may be unwound from reel 16 moving finger means 22a in the direction of arrow 134 so that tape 14 does not become operatively associated with apex 88a while spring 26 is transferred from takeup drum means 28 to power drum means 48.

The speed of tape 14 during its travel in the direction of arrow 132 may be controlled by the governor 24. During travel of tape 14 in the direction of arrow 132, spring 82a brings finger 22a into engagement with tape 14 forcing it into operative association with apex 88a thereby causing speaker 90a to reproduce the sounds recorded on tape 14.

While the particular devices for reproducing recorded sounds in toys herein shown and described in detail are fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that they are merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design herein shown.

We claim:

1. In a sound-reproducing apparatus suitable for use in toys including:

drum means;

elongated sound track carrier means attached to said drum means;

spring means connected to said drum means for rotating said drum means in a direction to normally wind said sound track carrier means onto said drum means;

governor means for controlling the speed of rotation of said drum means;

said sound track carrier means having a free end adapted to be pulled to unwind said sound track carrier means from said drum means while adding energy to said spring means; and

sound-reproducing means for reproducing sounds recorded on said sound track carrier means, the improvement comprising:

pivoted means frictionally engaging said carrier means for holding said carrier means against said sound-reproducing means only during winding of said sound track carrier means onto said drum means by said spring means and being responsive to movement of said carrier means when being unwound from said drum means to swing away from said reproducing means.

2. An improvement as stated in claim 1 wherein said sound-reproducing means includes a speaker cone having a wedged shaped apex, wherein said sound track carrier means has ridges engageable with said apex and wherein said pivoted means comprises a finger means swingably mounted adjacent said apex for forcing said sound track carrier means into engagement therewith.

3. An improvement as stated in claim 1 wherein said sound-reproducing means includes a speaker cone having an aperture provided in its apex, wherein said sound track carrier means has ridges engageable with an edge of said aperture and wherein said pivoted means comprises finger means swingably mounted in said aperture for forcing said sound track carrier means into engagement with said edge.