PATENT SPECIFICATION (11) 1 584 720

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(19)

(54) TOY

(71) We, TOMY KOGYO CO., INC., a corporation organised under the laws of Japan, of No. 9-10, Tateishi 7-chome, 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 toy and is more particularly, though not exclusively, concerned with a toy in the form of a stylized plastics chicken.

According to one aspect of the present invention there is provided a toy comprising a first button, an analog display provided on a rotatable annular disk, a digital display provided on a scroll positioned behind the central opening of said annular disk, and means operationally connecting said first button to said displays for depicting on said displays the number of times said first button has been depressed by rotating said annular display and winding said scroll.

According to another aspect of the present invention there is provided a toy having the form of a stylized plastics chicken, comprising:

(a) an analog display provided on a rotatable annular disk;

(b) a digital display provided on a scroll positioned behind the central opening of said annular disk;

(c) first, second and third buttons;

(d) means operationally connecting said first button to said displays for depicting on said displays the number of times said first button has been depressed;

(e) a movable head;

(f) means operationally connecting said first button to said movable head for moving said movable head each time said first button is depressed;

(g) shutters normally maintained in a closed position concealing said digital display;

(h) means operationally connecting said second button to said shutters for opening said shutters to reveal said digital display when said second button is depressed; and

(i) means operationally connecting said third button to said displays for returning said displays to zero.

An embodiment of the invention will now be described by way of example, with reference to the accompanying drawings in which:

Figure 1 is a front view of the amusement device of the present invention, illustrating the shutters closed over the digital display and an analog display of zero;

Figure 2 is a leftside elevational view of the toy;

Figure 3 is a top plan view;

Figure 4 is a front view of the toy with its front case removed, illustrating the motion of the head and analog display resulting when the counting button is depressed;

Figure 5 is a front view showing a digital display of zero, and is a front view with the front case, sub-chassis, shutters and annular disk removed;

Figure 6 is an exploded perspective view illustrating construction of the head;

Figure 7 is a sectional view taken along line 7-7 of Figure 5, showing motion resulting from depression of the counting button;

Figure 8 is an exploded perspective view showing the relationship of the elements in Figure 7;

Figure 9 is a sectional view taken along line 9-9 of Figure 4, illustrating relative motions of the annular disk and ratchet mechanism for preserving the count and then restoring it to zero upon depression of the release button;

Figure 10 is a bottom plan view of the annular disk;

Figure 11 is a perspective view depicting the major elements of Figure 9 in exploded form and showing their relative motions;

Figure 12 is a partial sectional view taken along the line 12-12 of Figure 5, illustrating operation of the shutter mechanism; and

Figure 13 is a top plan perspective view of the elements in Figure 12 in exploded form.

The toy of the present invention is illustrated in Figure 1, and consists of a stylized plastic casing 16 provided with head 18 and body 20 supported by base 22, in which

operating buttons 24, 26 and 28 are mounted. Semi-circular analog display opening 30 and circular frame 32 above it are provided by sub-chassis 34 and are visible through transparent window 36, which is mounted on the front case 38 of body 20. Shutters 128 and 136, illustrated in closed position, are visible through square digital display opening 37 within frame 32, and annular disk 92 is illustrated displaying a count of zero through analog display opening 30.

Turning now to Figure 5, it will be apparent that button 24 is provided with a pair of lever arms 40 terminating in pins 42 that are journaled into mounting blocks 44 projecting from the back case 39 of body 20, so that button 24 is free to move when it is depressed. The remaining buttons are similarly mounted. Member 46 extending from spring 47 to button 24 is generally L-shaped, with the foot of the "L" projecting outward under button 24 so that member 46 moves downward as button 24 is depressed.

Turning now to Figure 8, it will be apparent that ratchet engaging member 48 is pivoted to member 46 by peg 50, which protrudes from member 46 and is inserted in hole 52 in member 48. In this manner a downward motion of member 46 imparts a similar downward motion to member 48. Spring 54 is stretched between anchor point 56 protruding from member 46 and lever arm 58 of member 48, thereby producing a torque that urges tooth 60 into ratchet wheel 62. Tooth 60 engages a tooth of wheel 62 when member 46 undergoes a downward motion, so that wheel 62 rotates through a small angle. Advancement through an angle larger than that corresponding to a single tooth of wheel 62 is precluded because downward movement of member 48 advances stopping block 64 projecting from member 48 into a position to interfere with the motion of the next tooth. Offsetting collar 68 is fixedly secured to both wheel 62 and large gear 66, and they are mounted for rotation as a unit. Rotation of wheel 62 caused by a downward movement of member 48 therefore produces an identical angular rotation in gear 66 and, if gear 66 is locked into position when member 48 moves upward, tooth 60 will slide past the tooth of wheel 62 it has just advanced. As will be seen, a ratchet mechanism acting on annular disk 92 performs such a locking function.

Small gear 70 meshes with gear 66 and imparts its rotation to take-up cylinder 72, which is fixedly secured to gear 70 and is mounted for rotation together with it. This rotation of cylinder 72 unwinds scroll 74 from cylinder 76, which is fixedly secured to small gear 78 and is mounted for rotation together with it. Gear 80 is mounted for rotation and meshes with gear 78. Shaft 82 is fixedly secured to gear 80 and extends through spring 84 to form an axis around which ratchet wheel 86 is free to rotate. Small knobs 88 and 90, protruding from gear 80 and wheel 86 respectively, provide anchor points for hooks 91 and 93 at each end of spring 84. It should be apparent that spring 84 provides means for exerting a torque on gear 80. With scroll 74 fully wound onto cylinder 76, an initial torque can be selected by rotating ratchet wheel 86 until the desired torque is achieved and then fixing wheel 86 at that position by engaging against tooth 88, illustrated more fully in Figure 5 as an element of clamping block 89. Thereafter the torque is increased as each segment of scroll 74 is unwound from cylinder 76 to cylinder 72.

It should now be apparent that depressing button 24 produces a downward movement in member 46 that is translated into a fixed angular rotation of gear 66 by the action of tooth 60 and stopping element 64 against wheel 62. This rotation is communicated through gear 70 to cylinder 72 and thence, through the unwinding of a fixed segment of scroll 74, to cylinder 76. Scroll 74 is kept taut when it is fully wound on cylinder 76 by the initial torque produced by spring 84, and this tension increases as segments of scroll 74 are wound onto cylinder 72. The initial segment of scroll 74 bears the digit "0" positioned behind digital display opening 37, as is illustrated in Figure 5, and the digits on later segments increase sequentially.

Turning next to Figures 4, 7 and 10 annular disk 92 is positioned behind sub-chassis 34. The central opening 94 of disk 92 corresponds in circumference to circular frame 32, so that disk 92 is free to rotate about a circular flange (not shown) on the reverse side of sub-chassis 34 at the periphery of frame 32. A small hook (not shown) at the bottom of this circular flange extends through opening 94 to provide a support behind disk 92. An array of ratchet teeth 96 extends approximately half way around the outer periphery of disk 92 and faces gear track 98, which is positioned about half way around the periphery of central opening 94. As will be seen, these members provide additional points of support behind the dish 92.

Turning next to Figure 7, it is apparent that gear 66 provides a point of support behind disk 92 and meshes with gear track 98. Rotation of gear 66 therefore causes annular disk 92 to rotate, in addition to winding scroll 74 from cylinder 76 to cylinder 72. One symbol such as chick representation 99 is presented on the front side of disk 92 for every ratchet tooth 96, as is illustrated in Figure 11, and an additional chick advances into view through analog display

opening 30 with each rotary movement of disk 92, as is illustrated in Figure 4. Disk 92 is positioned in sub-chassis 34 so that the number of chicks visible in opening 30 corresponds to the digit on scroll 74 behind digital display opening 37.

Turning now to Figures 5 and 9, resilient bar 100 is pivotally mounted to lever arms 40 of button 28 in a manner that moves bar 100 downward when button 28 is depressed. In the undepressed state, support 102, which protrudes from the back case 39, flexes bar 100 and urges a ratchet engaging tooth 104 into a locking action with respect to one of the ratchet teeth 96 on annular disk 92. When button 28 is depressed, however, ramp 106 on bar 100 rides over block 108 extending from the back of sub-chassis 34, thereby forcing tooth 104 away from ratchet tooth 96 on annular disk 92 and deactivating the ratchet mechanism. It should be apparent that, when tooth 104 is disengaged, the tension maintained by spring 84 causes scroll 74 to rewind onto cylinder 76 and disk 92 to rotate back to its initial position. When engaged, tooth 104 acts as an additional point of support behind disk 92.

Turning now to Figures 12 and 13, it is apparent that depression of button 26 causes an upward movement of gear segment 110 at the end of L-shaped member 112, which is securedly fixed to a lever arm 40 of button 26. Gear segment 110 meshes with small gear 114, which is fixedly secured to large gear 116 mounted for rotation with it. Gear 116, in turn, meshes with upper gear track 118 and lower gear track 120.

Lower gear track 120 is provided with flanges 122 which provide support as it slides along rib 124 projecting from the back case 39. Bar 126 extends from track 120 to lower shutter 128, whose flanges 130 guide shutter 128 as it slides over ribs 132 projecting from the back case 39. Upper gear track 118 is supported by tab 138 which extends from lower shutter 128 and by tab 140, which projects from clamping block 141 as is illustrated in Figure 5.

It should now be apparent that depression of button 26 causes rotation of gear 116, which in turn drives gear tracks 118 and 120 to open shutters 128 and 136. Spring 142 returns button 26 to its original state, forcing the shutters back together. In this undepressed state characters 144 and 146 are united, forming a question mark.

Turning now to Figure 6, it will be apparent that, when axle 148 of back cover 150 of head 18 is inserted through holes 152 and 154 of the back case 39 and front case 38 respectively, screw 158 extending through axle 148 will unite front cover 160 with back cover 150 so that they can freely rotate through a small angle about axle 148 as a unit. Indentation 184 on back cover 150 and a corresponding indentation (not illustrated) on front cover 160 are provided for mounting beak 186, as is illustrated in Figure 1. In the "down" position eye-lashes 162 will be visible through eye opening 164 in front cover 160, and in the "up" position eye 166 will be visible. In this manner the chicken appears to blink its eye and nod its head when the position changes from "down" to "up" and back. The source of this motion is found in Figure 5. Reference number 168 represents a cylinder which is mounted for rotation and has short lever arm 170 and long lever arm 172 radiating from it. It is apparent that downward motion of peg 174 on member 46 is communicated to peg 176 that protrudes through slot 178 in back case 39, thereby displacing peg 176 from its at-rest position maintained by spring 180 stretched between peg 176 and anchor point 182 on back case 39.

Springs 47 and 180, acting through member 46, return button 24 to its at-rest position when it is no longer depressed. It will be recalled that button 26 is returned by spring 142. Although not illustrated, button 28 is restored in the same manner as button 26.

The total operation of the toy will now be apparent. The counting mechanism is activated by depression of button 24. This has the effect of both advancing scroll 74 so that the appropriate digital count is positioned for display and rotating annular disk 92 so that another chick is added to the analog display continually visible in display opening 30. As these displays are being adjusted, head 18 nods and its eye blinks. The digital count corresponding to the analog display visible through opening 30 is concealed until button 26 is depressed and shutters 128 and 136 are separated to reveal the digital representation on scroll 74. Depression of button 28 disengages the ratchet mechanism holding annular disk 92, so that spring action returns both the digital and analog displays to zero and the child can begin the counting operation anew.

WHAT WE CLAIM IS:–

1. A toy comprising a first button, an analog display provided on a rotatable annular disk, a digital display provided on a scroll positioned behind the central opening of said annular disk, and means operationally connecting said first button to said displays for depicting on said displays the number of times said first button has been depressed by rotating said annular display and winding said scroll.

2. A toy as claimed in claim 1, further comprising a second button, shutters, and means operationally connecting said second button to said shutters for maintaining said

shutters in a closed position so as to conceal said digital display until said second button is depressed.

3. A toy as claimed in claim 1, further comprising a second button and means operationally connecting said second button to said displays for returning said displays to zero.

4. A toy as claimed in claim 1, further comprising second and third buttons, shutters, means operationally connecting said second button to said shutters for maintaining said shutters in a closed position so as to conceal said digital display until said second button is depressed, and means operationally connecting said third button to said displays for returning said displays to zero.

5. A toy as claimed in any preceding claim, having the form of a stylized plastics chicken.

6. A toy having the form of a stylized plastics chicken, comprising:

(a) an analog display provided on a rotatable annular disk;

(b) a digital display provided on a scroll positioned behind the central opening of said annular disk;

(c) first, second and third buttons;

(d) means operationally connecting said first button to said displays for depicting on said displays the number of times said first button has been depressed;

(e) a movable head;

(f) means operationally connecting said first button to said movable head for moving said movable head each time said first button is depressed;

(g) shutters normally maintained in a closed position concealing said digital display;

(h) means operationally connecting said second button to said shutters for opening said shutters to reveal said digital display when said second button is depressed; and

(i) means operationally connecting said third button to said displays for returning said displays to zero.

7. A toy as claimed in claim 6, wherein said movable head has an eye opening and further comprises a stylized representation of a closed eye visible through said opening when said first button is not depressed, and a stylized representation of an open eye visible through said opening when said first button is depressed.

8. A toy as claimed in claim 6 or 7, wherein said scroll comprises a pair of parallel cylinders that do not touch and a rectangular strip of flexible material bearing a series of digits that begin with zero near a first end that is attached to one of said cylinders at its periphery and increase sequentially up to the other end of said strip, which is attached to the periphery of the other cylinder.

9. A toy as claimed in claim 8, further comprising means for keeping said scroll taut.

10. A toy as claimed in claim 6, 7, 8 or 9, wherein said annular disk bears equally spaced symbols behind a panel having an opening through which symbols can be seen.

11. A toy substantially as hereinbefore described with reference to the accompanying drawings.

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1584720 COMPLETE SPECIFICATION
6 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

FIG. 1.

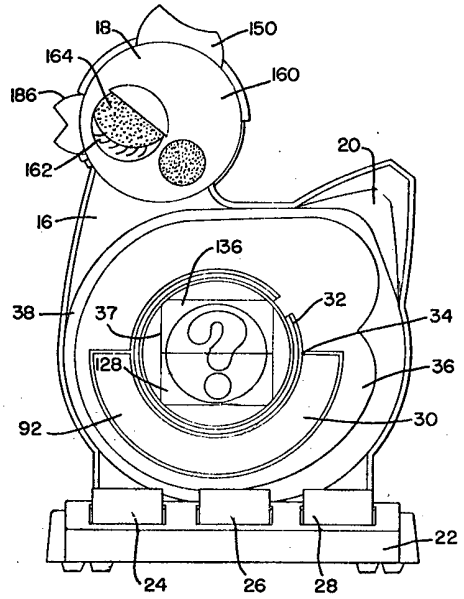


FIG. 2.

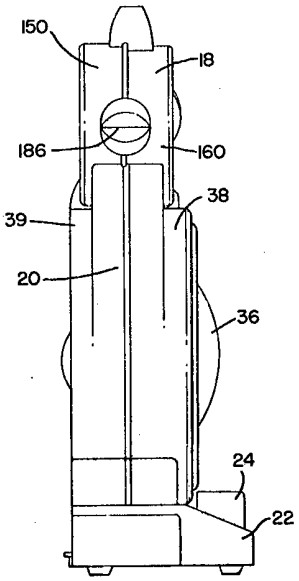


FIG. 3.

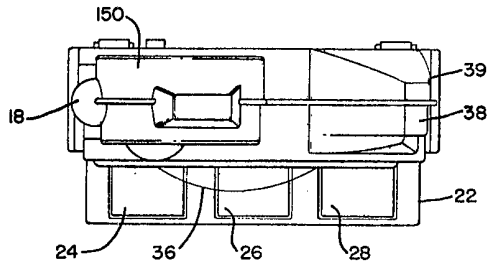
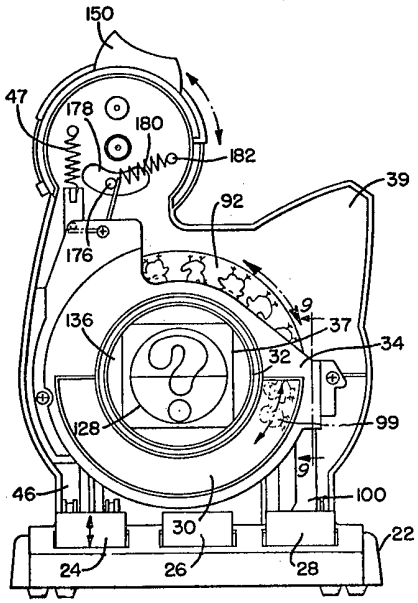


FIG. 4.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176
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34
32
128
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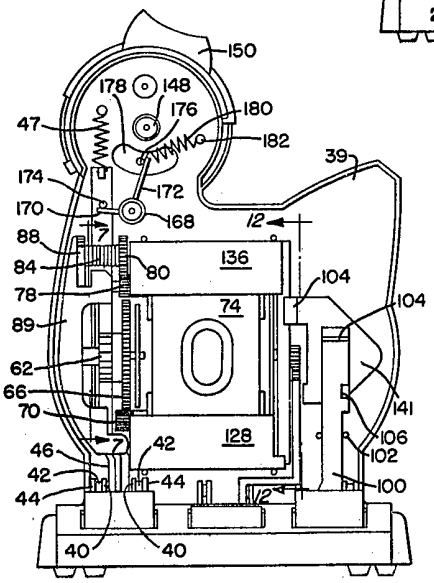
FIG. 5.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89
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70
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40

1584720 COMPLETE SPECIFICATION
6 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 3

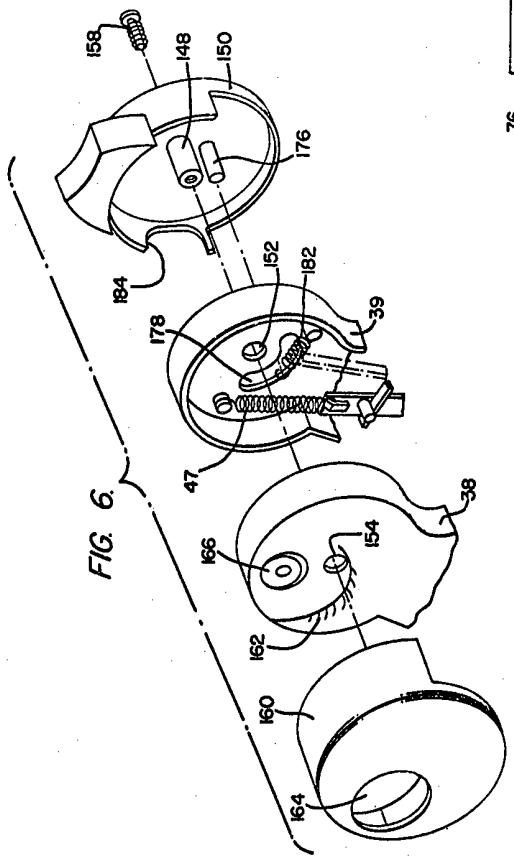

FIG. 6.

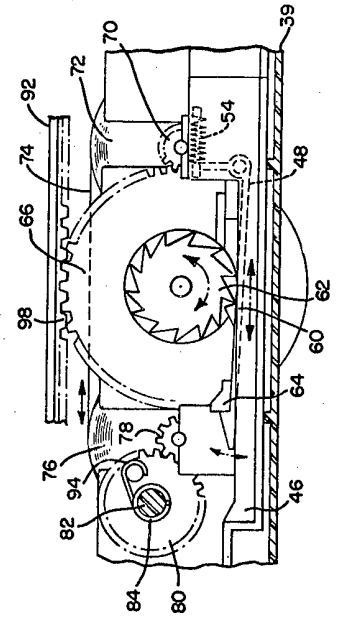

FIG. 7.

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Sheet 4

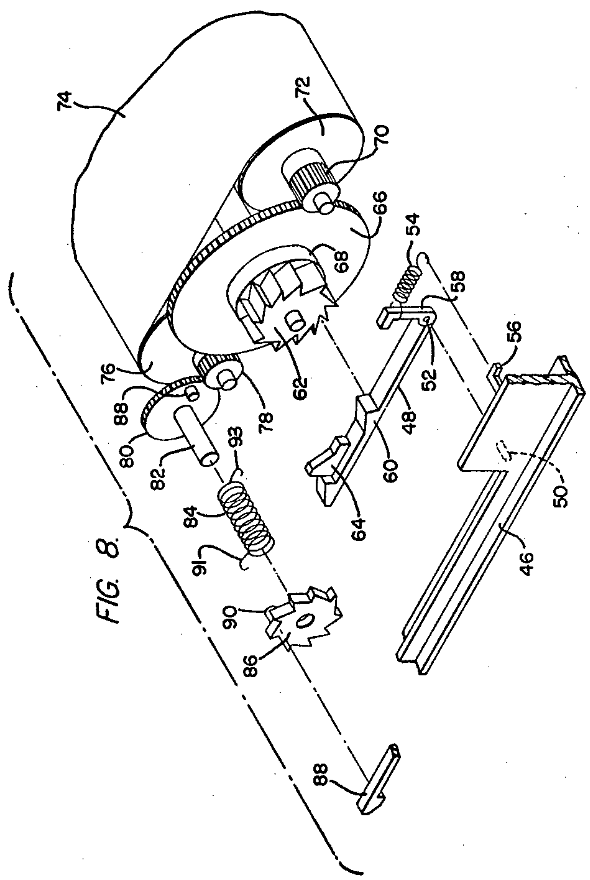


FIG. 8.

FIG. 9.

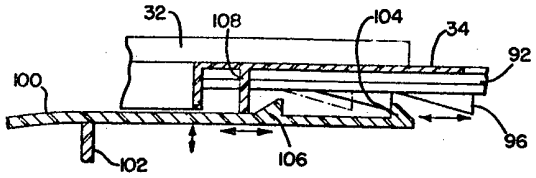


FIG. 10.

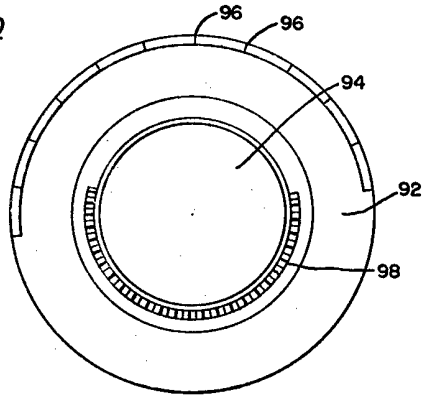
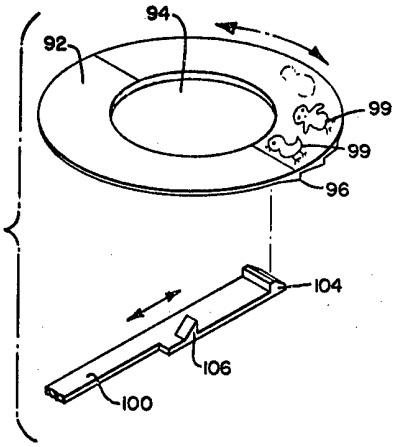


FIG. 11.



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Sheet 6

FIG. 12.

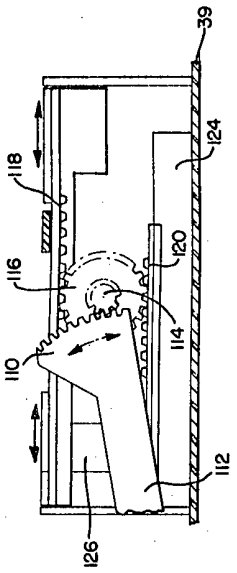

FIG. 13.