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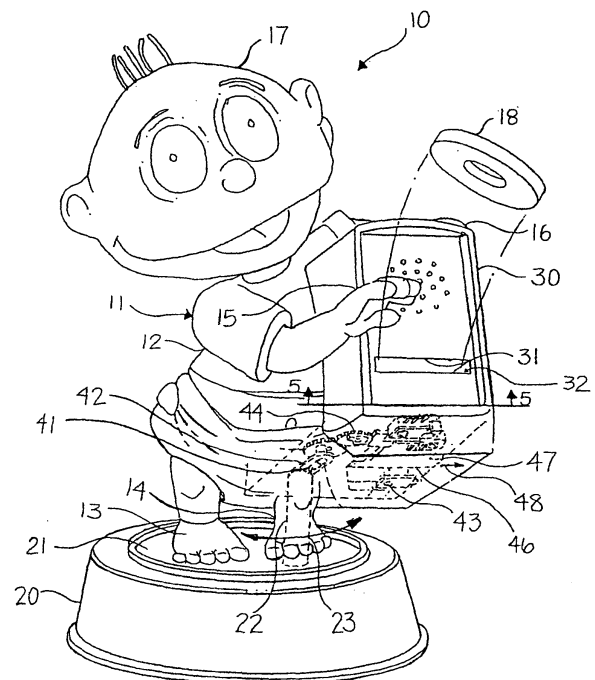
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(54) **Disk launching toy**

(57) A disk launching toy (10) comprises a plurality
of disks and a base (20) having a support surface and
support means. It further comprises a disk launcher (30,
31, 32) supported above the support surface by the sup-
port means and launching a stream of the disks. Oscil-
lation means coupled to the support means for oscillating
the disk launcher (30, 31, 32) in a side-to-side pivotal
motion cause the stream of disks to be sprayed in an
angular pattern.



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Description

Field of the Invention

[0001] This invention relates generally to toys having means for launching a projectile and particularly to toys which launch disk-shaped objects.

Background of the Invention

[0002] Through the years a variety of projectile launching toys and games have been provided by practitioners in the art. One of the more popular types of object launching toys to emerge may be generally described as a "disk launcher". Such toy types acquire their name from the general shape of the objects which they launch. The type of disk utilized in such toys and related apparatus may include circular disk-shaped objects formed of plastic or wood or other suitable material. Such disks may also include objects such as game tokens or chips as well as various coins.

[0003] The basic operation of disk launching devices is relatively simple and usually includes a magazine within which a number of disks are stored. In most instances, the magazine storage is organized to house a stacked array of disk objects. Energy for launching is provided by various apparatus including spring-driven launchers which function largely on impact energy exchange as well as spinning rollers or other devices which impart energy through rolling or spinning the disk object down a launching channel or chute. In the face of the continued popularity and widespread enjoyment of disk launching apparatus, practitioners in the toy arts have been prompted to provide a variety of disk launching devices. For example, U.S. Patent 5,613,482 issued to Thai, et al. sets forth a DISK SHOOTING TOY GUN having a housing generally resembling a pistol supporting a moving trigger. The pistol housing further includes a magazine within which a stacked array of disk-shaped objects are stored. A slide is movable in response to a trigger released spring to impact the topmost disk in the magazine and launch it outwardly from the gun.

[0004] U.S. Patent 5,611,322 issued to Matsuzaki, et al. and its parent patent 5,471,967 also issued to Matsuzaki, et al. sets forth a DISK DISCHARGING TOY having a pistol-shaped housing upon which a cylindrical magazine for disk objects is supported. A motor-driven roller is positioned within the pistol housing interior within a launching channel. A trigger mechanism is operative to move the bottommost disk object from the magazine forwardly into the launching channel. Within the channel, the disk object is rapidly spun by the motor-driven roller and launched outwardly from the housing.

[0005] U.S. Patent 5,199,410 issued to Cheng sets forth a TOY SAUCER LAUNCHING AND CATCHING DEVICE having a housing supporting a receptacle defining a downwardly tapered conical surface and a launching station at the bottommost point thereof. A piv-

otally supported lid is secured to the tapered portion of the housing. A pistol grip extends downwardly from the housing bottom and includes a trigger mechanism for launching a disk which has been caught within the tapered surface and caused to fall downwardly into the launching area.

[0006] U.S. Patent 5,505,575 issued to Killion sets forth a DISK LAUNCHER having a generally cylindrical housing supporting a handle downwardly extending therefrom. The housing further defines an interior cavity within which a launching shuttle is pivotally movable under the urging of a power spring. An opening in the housing is provided through which a disk may be inserted. A trigger mechanism permits the launching member to be locked in a launching position and released to impart energy to a disk object.

[0007] U.S. Patent 4,248,202 issued to Jaworski, et al. sets forth a DISK LAUNCHER having a generally round housing with an integrally formed handle for holding by an operator. A manually operable actuating arm is moved against a spring to prepare a disk object for launch. The trigger releases the spring pivoting the actuating arm against the disk and imparting launch energy thereto.

[0008] U.S. Patent 4,170,215 issued to Kettlestrings sets forth a DISK TOY AND LAUNCHER includes two predominantly planar pieces formed of plastic material and joined together to form a slotted receptor and a handle portion. A toy disk is inserted into the slotted receptor and engages a catch on its outside rim. A spring is preloaded during disk insertion and moves a plunger to impact the disk and launch it.

[0009] U.S. Patent 3,734,503 issued to Breslow sets forth a TARGET AND ADJUSTABLE TRAJECTORY DISK LAUNCHER having a target game including target articles and means defining a target support area for supporting the target articles thereon. A movable missile launching member is adjustable in elevation for aiming at the target articles.

[0010] U.S. Patent 2,805,657 issued to Shaffer sets forth a GAME SHOOTER having a housing supporting a pistol grip handle which in turn supports a movable trigger. A disk is received within the housing and positioned for impact by a rapidly pivoting spring-driven launcher also supported within the housing.

[0011] As mentioned above, a number of disk launching devices are also provided which launch a coin or similar token rather than a disk-shaped toy object. For example, U.S. Patent 3,191,588 issued to Thew sets forth a COIN GUN having a magazine supporting a plurality of coins in a stacked array together with a housing within which a spring-driven launcher is slidably supported. The launcher is cocked by drawing an outer handle coupled to the slider rearwardly until the trigger mechanism latches the slider against the energy of the spring. Upon release of the trigger, the slider is driven rapidly forward against the uppermost coin in the magazine launching it.

[0012] U.S. Patent 4,884,992 issued to Grimes sets forth a COIN-DISPENSING APPARATUS having a gen-

eral shape of a handgun and provided with a trigger for manually advancing an endless belt formed with coin receptacles for receiving coins. A reservoir supports a stacked array of coins which are fed one at a time into the coin receptacles as the belt advances. Each pull of the trigger advances the endless belt to displace the forwardmost coin from the belt.

[0013] U.S. Patent 4,910,646 issued to Kim sets forth a FLASHLIGHT-COIN THROWING GUN having a revolver-shaped main body formed by uniting separable main bodies. A gun barrel portion and a handle portion includes a percussion mechanism for throwing a coin through the gun barrel. A trigger operably coupled to the coin throwing mechanism causes an integrally formed flashlight to flash on as a coin is launched.

[0014] U.S. Patent 3,515,111 issued to Auge sets forth an SPRING-ACTUATED PROJECTILE PROJECTING DEVICE having an elongated cylindrical housing within which a stacked array of disk-like projectiles are supported. A pivotally supported hammer is operable at the upper end of the device and is drawn rearwardly against a power spring and released to impact and launch the topmost projectile.

[0015] U.S. Patent 2,766,989 issued to Sivertson sets forth a PLAYING CARD DISTRIBUTOR having a generally rectangular housing within which a deck of cards is received. A handle resembling a pistol handle extends downwardly from the housing and supports a movable trigger. A launching ram is supported within the housing and is movable against a power spring. The launching ram is drawn or cocked against the spring and secured by the trigger mechanism. A press of the trigger allows the ram to move forwardly and launch the bottommost card of the deck.

[0016] U.S. Patent 4,413,750 issued to Morroni, et al. sets forth a CHIP DISPENSER for use with objects such as bingo chips having a supply tube within which a stack of chips are received and a body having a chamber which houses a dispensing member. The dispensing member is a crescent-shaped member having two horns. The dispensing member is pivoted against a spring to prepare for chip-launch which occurs as the member is released to impact the chip.

[0017] While the foregoing described prior art devices have to some extent improved the art and have in some instances enjoyed commercial success, there remains nonetheless a continuing need in the art for evermore interesting improved and amusing disk launching toys.

Summary of the Invention

[0018] Accordingly, it is a general object of the present invention to provide an improved disk launching toy. It is a more particular object of the present invention to provide an improved disk launching toy which imparts further amusement and entertainment to the disk launching process.

[0019] In accordance with the present invention, there

is provided a disk launching toy comprising: a base having a pivotably supported plate; a toy figure supported upon the plate and pivotable therewith; a plurality of disks; a disk launcher supported by the toy figure and pivotable therewith, the disk launcher having a magazine for storing the plurality of disks and having means for continuously launching the disks; and oscillation means, coupled to the toy figure and the base, for oscillating the plate, the toy figure and the disk launcher to launch the disks in an angularly dispersed stream.

[0020] In a broader sense, the present invention provides a disk launching toy comprising: a plurality of disks; a base having a support surface and support means; a disk launcher supported above the support surface by the support means, the disk launcher launching a stream of the disks; and oscillation means coupled to the support means for oscillating the disk launcher in a side-to-side pivotal motion causing the stream of disks to be sprayed in an angular pattern.

Brief Description of the Drawings

[0021] The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in the several figures of which like reference numerals identify like elements and in which:

Figure 1 sets forth a front perspective view of a disk launching toy constructed in accordance with the present invention;

Figure 2 sets forth a side elevation view of the present invention disk launching toy;

Figure 3 sets forth a partial section view of the disk launching mechanism of the present invention toy taken along section lines 3-3 in Figure 2;

Figure 4 sets forth a partial section view of the disk launching mechanism of the present invention toy taken along section lines 3-3 in Figure 2 showing a disk during launch;

Figure 5 sets forth a partial section view of the present invention disk launching toy taken along section lines 5-5 in Figure 1; and

Figure 6 sets forth a broken section view of the base portion of the present invention disk launching toy looking upwardly from the bottom surface of the base.

Description of the Preferred Embodiment

[0022] Figure 1 sets forth a front perspective view of a disk launching toy constructed in accordance with the present invention and generally referenced by numeral 10. Toy 10 includes a toy figure 11 preferably formed of a molded plastic material or the like and having a body 12 supported by feet 13 and 14. Body 12 further includes hands 15 and 16 and a head 17. A generally circular base 20 defines a rotatable plate 21 supporting feet 13 and 14.

[0023] Disk launching toy 10 further includes a launcher housing 30 integrally formed with toy figure 11 and appearing to be held thereby. Launcher housing 30 further defines an elongated launcher slot 31 and an inwardly extending launcher channel 32. By means set forth below in greater detail, the operative mechanism within launcher housing 30 operates to launch a succession of disk-shaped toy objects such as disk 18 outwardly through launcher channel 32 and launcher slot 31.

[0024] The operative mechanism within launcher housing 30 includes a cam gear 44 operatively coupled to a gear 42. By means set forth below in greater detail, cam gear 44 is rotated by an internal battery-powered motor drive mechanism. Suffice it to here that cam gear 44 is rotated as disk launching toy 10 is operated. Gear 44 engages a gear 42 having an offset or eccentric post 43 therein. An elongated generally cylindrical post 22 extends downwardly through toy figure 10 and foot 14 thereof. Post 22 passes downwardly through plate 21 and is coupled to an arm 141 in the manner shown in Figure 6. The upper end of post 22 is joined to an angularly disposed elongated link 40 having a slot 41 formed therein. Slot 41 receives post 43 of gear 42. As gear 42 is rotated, the offset position of post 43 causes link 40 to be pivotally moved in an oscillatory motion in the manner indicated by arrows 23. By means set forth below in greater detail, the oscillatory motion induced in link 40 is communicated by post 22 to the mechanism set forth below in Figure 6 to cause the combination of toy figure 10 and launcher housing 30 to undergo a corresponding pivotal oscillation in the directions indicated by arrows 23. Thus, as the mechanism within launcher housing 30 operates, the combined structure of toy figure 10 and launcher housing 30 moves side-to-side in a predetermined range of angular motion. This in turn causes the annular disks which are launched from launcher channel 32 and launcher slot 31 to be angularly dispersed outwardly from toy figure 11 and launcher housing 30.

[0025] Launcher housing 30 further supports a feed slider 46 having a cam follower 45 engaging cam gear 44 and an upwardly extending feed tab 47. The operative mechanism of feed slider 46 and feed tab 47 is set forth below in Figures 3 and 5. Suffice it to note here that the rotation of cam gear 44 causes cam follower 45 to force feed slider 46 outwardly in the direction indicated by arrow 48. While this mechanism is described below in greater detail, suffice it to note here that the outward movement induced in feed slider 46 and feed tab 47 is

operative to feed a succession of disks such as disk 18 into the launcher mechanism described below.

[0026] Thus, as toy 10 is operated, toy figure 11 and launcher housing 30 pivot through a predetermined angular range in a side-to-side motion which a succession of disks such as disk 18 are sequentially launched outwardly through launcher channel 32 and slot 31.

[0027] Figure 2 sets forth a side perspective view of disk launching toy 10. As described above, toy 10 includes a toy figure 11 having a head 17, a pair of hands 15 and 16 and a pair of supporting feet 13 and 14. A base 20 supports a rotatable plate 21 upon which feet 13 and 14 rest. Toy 10 further includes a launcher housing 30 defining a launcher slot 31 and a launcher channel 32. Launcher housing 30 further includes a magazine 50 within which a plurality of to-be-launched disks 51 is arranged in a generally stacked array. Launcher housing 30 further includes a door 52 shown in its open position in Figure 2 which provides access to magazine 50 for loading purposes. During normal operation, door 52 is pivoted upwardly to close magazine 50. In the preferred fabrication of the present invention, disks 51 are formed of a lightweight foam plastic material to provide safety in the event of impact with individuals in the area of disk launching toy 10 during operation. However, it will be apparent to those skilled in the art that disks 51 may be fabricated of virtually any suitable material without departing from the spirit and scope of the present invention.

[0028] Figures 3 and 4 set forth section views of disk launching toy 10 taken along section lines 3-3 in Figure 2. By way of overview, the section view of Figure 3 shows the launcher mechanism of toy 10 at the initial stage prior to the commencement of a disk launching function. In contrast, the section view of Figure 4 shows the disk launching mechanism of toy 10 at the point of operation immediately prior to the launching of a disk object.

[0029] More specifically, disk launching toy 10 includes a frame 60 having a magazine wall 53 extending upwardly therefrom. Magazine wall 53 encircles a magazine 50 and a launcher channel 32. Magazine wall 53 further defines a slot 54. A pair of upwardly extending flanges 85 and 86 support a shaft 84 upon which a pivotable lock lever 80 is supported. Lock lever 80 is coupled to a spring 83 which urges lock lever 80 upwardly to a generally horizontal position. Lock lever 80 further defines a vertically extending edge 81 and an angled surface 82.

[0030] A post 81 extends upwardly from frame 60 and secures one end of a spring 80. Spring 80 forms a second end 82. A spring pivot plate 70 is pivotally secured to frame 60 by a pivot post 61. Frame 60 further defines an upwardly extending spring tab 63. Spring pivot plate 70 further includes a cam 72 and a post 71. A spring 64 includes an end 65 positioned against spring tab 63 and a spring beam 67. Spring beam 67 in turn defines an end 66. A latch plate 75 is slidably supported upon frame 60 and is pivotally secured to pivot plate 70 by post 71 thereof. Latch plate 75 includes an end 76 having a notch 77

formed therein. Latch plate 75 further includes an end tab 78 having a notch 79 formed therein. Notch 79 receives end 82 of spring 80.

[0031] A wheel 90 defines a square aperture 91 which receives square shaft 92 which is driven by motor 99 (seen in Figure 5). Wheel 90 further includes an offset eccentric pin 93. Wheel 90 is positioned above end 76 of latch plate 75. Frame 60 further supports a cylindrical boss 72 having a fastener 74 received therein. Fastener 74 passes through frame 60 and rotatably supports gear 42 (seen in Figure 5).

[0032] A feed slider 46 is slidably supported upon the underside of frame 60 and includes a push rod 49, a cam follower 45 and a feed tab 47. A cleat 55 is positioned within launcher channel 32.

[0033] In operation, motor 99 (seen in Figure 5) is energized causing square shaft 92 to rotate. The rotation of square shaft 92 produces a corresponding rotation of wheel 90 in the direction indicated by arrow 94. This rotation carries pin 93 into notch 77 thereby engaging pin 93 and wheel 90 with end 76 of latch plate 75. The continued rotation of wheel 90 and the engagement of pin 93 causes latch plate 75 to be drawn in the direction indicated by arrow 100.

[0034] As is better seen in Figure 2, magazine 50 supports a plurality of disks stacked within magazine 50 such that a bottommost disk 58 rests upon the bottom surface of magazine 50 and cleat 55. To facilitate description of the interior of magazine 50, disk 58 is shown in phantom line drawing. However, it will be understood that disk 58 is positioned upon the bottom surface of magazine 50 in the manner shown in Figure 4 as the launcher mechanism begins the operative cycle described in Figures 3 and 4.

[0035] Accordingly, at latch plate 75 is drawn downwardly in the direction indicated by arrow 100, the operative cycle of the launcher mechanism is initiated.

[0036] Figure 4 sets forth the launcher mechanism of the present invention disk launching toy at an operative point immediately prior to the actual launch of a disk such as disk 58. This operative point has been reached as the rotation of wheel 90 described above in Figure 3 continues to draw latch plate 75 in the direction indicated by arrow 100.

[0037] More specifically, disk launching toy 10 includes a frame 60 having a magazine wall 53 extending upwardly therefrom. Magazine wall 53 encircles a magazine 50 and a launcher channel 32. Magazine wall 53 further defines a slot 54. A pair of upwardly extending flanges 85 and 86 support a shaft 84 upon which a pivotable lock lever 80 is supported. Lock lever 80 is coupled to a spring 83 which urges lock lever 80 upwardly to a generally horizontal position. Lock lever 80 further defines a vertically extending edge 81 and an angled surface 82.

[0038] A post 81 extends upwardly from frame 60 and secures one end of a spring 80. Spring 80 forms a second end 82. A spring pivot plate 70 is pivotally secured to

frame 60 by a pivot post 61. Frame 60 further defines an upwardly extending spring tab 63. Spring pivot plate 70 further includes a cam 72 and a post 71. A spring 64 includes an end 65 positioned against spring tab 63 and a spring beam 67. Spring beam 67 in turn defines an end 66. A latch plate 75 is slidably supported upon frame 60 and is pivotally secured to pivot plate 70 by post 71 thereof. Latch plate 75 includes an end 76 having a notch 77 formed therein. Latch plate 75 further includes an end tab 78 having a notch 79 formed therein. Notch 79 receives end 82 of spring 80.

[0039] A wheel 90 defines a square aperture 91 which receives square shaft 92 which is driven by motor 99 (seen in Figure 5). Wheel 90 further includes an offset eccentric pin 93. Wheel 90 is positioned above end 76 of latch plate 75. Frame 60 further supports a cylindrical boss 72 having a fastener 74 received therein. Fastener 74 passes through frame 60 and rotatably supports gear 42 (seen in Figure 5).

[0040] A feed slider 46 is slidably supported upon the underside of frame 60 and includes a push rod 49, a cam follower 45 and a feed tab 47. A cleat 55 is positioned within launcher channel 32.

[0041] As is better seen in Figure 5, wheel 90 supports a cam gear 44 on the underside of frame 60 which includes cam edges 39 and 38.

[0042] In operation as the above-described rotation of wheel 90 continues under the force of motor 99 (seen in Figure 5) in the direction indicated by arrow 94, cam edge 39 of cam gear 44 contacts cam follower 45 of feed slider 46. The continued rotation of wheel 90 and cam gear 44 forces feed slider 46 outwardly in the direction indicated by arrow 103. This motion facilitates the downward movement of the bottommost disk within magazine 50 to the position shown as disk 58 within magazine 50. As wheel 90 and cam gear 44 continue to rotate, latch plate 75 moves downwardly in the direction indicated by arrow 100 causing spring pivot plate 70 to pivot about post 61 in the direction indicated by arrow 101. The contact of end 66 of spring 64 against edge 81 of lock lever 80 causes beam 67 of spring 64 to flex as shown in solid-line representation in Figure 4. In addition as latch plate 75 moves downwardly, end tab 78 draws spring 80 to an extended position.

[0043] As latch plate 75 continues to move downwardly and pivot spring pivot plate 70, end 66 of spring beam 67 is drawn beyond edge 81 of lock lever 80 resulting in the release of spring beam 67. The resilience of spring beam 67 causes it to rapidly move in the direction indicated by arrow 102 to the straight line relaxed position shown in phantom depiction. As beam 67 straightens, it moves rapidly through slot 54 and impacts disk 58. The impact drives disk 58 outwardly through launcher channel 32 in the direction indicated by arrow 107.

[0044] As wheel 91 continues to rotate in the direction indicated by arrow 94, pin 93 is extracted from notch 77 (seen in Figure 3) of end 76 thereby releasing latch plate 75. As wheel 90 continues to rotate, the force of spring

80 draws latch plate 75 upwardly in the direction indicated by arrow 108. As latch plate 75 moves upwardly, end 76 thereof pivots outwardly in the direction indicated by arrow 105.

[0045] The upward movement of latch plate 75 under the force of spring 80 pivots spring pivot plate 70 in the direction indicated by arrow 104 returning spring pivot plate 70 and latch plate 75 to the positions shown in Figure 3. In addition, as spring pivot plate 70 is pivoted in the direction indicated by arrow 104, spring beam 67 and end 66 thereof are pivoted upwardly through slot 54. Angled surface 82 of lock lever 80 cooperates with spring 83 to force lock lever 80 to pivot downwardly and allow end 66 of spring 64 to pass over edge 81. Thus, spring 64 is returned to the relaxed position shown in Figure 3.

[0046] As wheel 90 continues to rotate, cam gear 44 moves feed slider 46 outwardly allowing the next operative cycle to begin and allowing the next disk in magazine 50 to be dropped into the launch position. Thus, the continued rotation of wheel 90 results in a succession of disks within magazine 50 being launched outwardly through launcher channel 32.

[0047] Figure 5 sets forth a section view of disk launching toy 10 taken along section lines 5-5 in Figure 1. Disk launching toy 10 includes a frame 60 supporting a motor 99, a switch 57 and a feed slider 46. Slider 46 includes a feed tab 47 and a cam follower 45. Feed slider 46 is slidably supported on the underside of frame 60 and is coupled to a return spring 68. Return spring 68 urges feed slider 46 in the direction indicated by arrow 116.

[0048] Launcher 10 further includes a cam gear 44 having a cam edge 39 and a cam edge 38 formed thereon. Cam gear 44 is operatively connected to motor 99 by a conventional speed reduction (not shown). Of importance with respect to the present invention is the rotational power provided by motor 99 to rotate the combination of cam gear 44 and wheel 90 (seen in Figure 3). Thus, when motor 99 is energized, cam gear 44 rotates in the direction indicated by arrow 110.

[0049] A gear 42 rotatably supported upon frame 60 by a fastener 74 (seen in Figure 3) supports an offset post 43. A link 40 extends from a post 22 (seen in Figure 1). Link 40 defines an elongated slot 41 which receives offset post 43.

[0050] In operation, as motor 99 is energized and causes rotation of cam gear 44 in the direction indicated by arrow 110, feed slider 46 is initially positioned as shown in solid-line representation due to the force of return spring 68. The rotation of cam gear 44 in the direction of arrow 110 causes a corresponding rotation of gear 42 in the direction indicated by arrow 111. As cam gear 44 continues to rotate in the direction of arrow 110, edge 39 is forced against cam follower 45. The force of edge 39 against cam follower 45 overcomes the force of return spring 68 moving feed slider 46 in the direction indicated by arrow 113. The movement of cam follower 45 produces a corresponding movement of feed slider 46 in the direction indicated by arrow 114. The movement of feed

slider 46 moves tab 47 correspondingly allowing the above-described fee of the next disk within magazine 50 (seen in Figure 2) into the launch position shown in Figure 4.

[0051] Of importance in Figure 5 is to note that the rotation of gear 42 in the direction of arrow 111 causes link 40 to undergo an angular movement in the directions indicated by arrows 112. The offset position of post 43 and the elongation of slot 41 result in an oscillatory pivotal movement of link 40 as gear 42 continues to rotate. The operation of link 40 is set forth below in Figure 6 in greater detail. However, suffice it to note here that the oscillatory movement of link 40 is coupled to plate 21 (seen in Figure 6) to cause toy figure 11 (seen in Figure 1) to pivot back and forth in the side-to-side motion illustrated in Figure 1 by arrows 23.

[0052] Thus, as motor 99 remains energized, the above-described disk launching process shown in Figures 3 and 4 results in a succession of disks being launched from disk launching toy 10. Simultaneously, the rotation of gear 42 produces the oscillatory pivotal movement of link 40 which in turn creates the side-to-side movement of toy figure 11 shown in Figure 1. This process continues as long as motor 99 remains energized.

[0053] Figure 6 set forth a partially sectioned bottom view of toy 10 showing the operative components by which the present invention toy oscillates toy figure 11 and the disk launching mechanism within launcher housing 30 (seen in Figure 2). As described above, toy figure 10 includes a generally circular base having a recess 25 formed in the upper surface thereof. As is also described above, a circular plate 21 is received within recess 25 and, as is seen in Figure 2, supports toy figure 11 upon feet 13 and 14. A launcher housing 30 is supported by toy figure 11 in the manner shown in Figures 1 and 2. Recess 25 further defines a trio of arcuate slots 121, 122 and 123 each surrounded by arcuate channels 124, 125 and 126. A center post 130 rotatably supports plate 21 within recess 25. A pair of fasteners 134 and 135 extend upwardly through slots 123 and 121 respectively to engage plate 21 and provide limited pivotal movement of plate 21 within recess 25. Center post 130 further includes a spring 137. Recess 25 further defines a slot 131 which extends beneath the end portions of spring 137. A post 138 receives the extending end portions of spring 137.

[0054] As is best seen in Figure 1, post 22 extends downwardly through foot 14 to plate 21. Within slot 122, a post 140 is supported by an arm 141 and is engaged by post 22 (seen in Figure 1). A fastener 136 secures post 140 and the lower end of post 22 (seen in Figure 1) within slot 122. Arm 141 is elongated and extends to slot 131. A pin 132 extending from arm 141 through slot 131 is received between the end portions of spring 137. The upper end of post 22 forms elongated link 40 which engages post 43 of gear 42. As is set forth above, cam gear 44 is driven by motor 99 (seen in Figure 5) and engages gear 42 causing it to rotate in the direction indicated by

arrow 142.

[0055] In operation, plate 121 supporting toy figure 11 (seen in Figure 1) is pivotally movable within recess 25 through a range of motion limited by the lengths of slots 121 through 123. This pivotal movement takes place about center post 130. As motor 99 is energized rotating cam gear 44 which in turn rotates gear 42 in the direction indicated by arrow 142, post 43 moves link 40 in the direction indicated by arrow 112. The attachment of link 40 to post 22 (seen in Figure 1) and the attachment of post 22 to post 40 cause arm 141 to pivot about pin 132 in the manner indicated by arrows 117. The fixed position of pin 132 converts the pivotal movement of arm 141 to rotational movement of plate 21 in the directions indicated by arrows 143 and 144. Thus, as gear 42 continues to rotate oscillating link 40 and arm 141, plate 21 supporting toy figure 11 and launcher housing 30 (seen in Figure 1) continues to oscillate back and forth within the limits of slots 121 through 123.

[0056] The positioning of pin 132 between the ends of spring 137 provides protection against undue stress or forces upon toy figure 11 and launcher housing 30 (seen in Figure 1). Such undo forces are absorbed by the flexing of the end portions of spring 137.

[0057] Thus, as the present invention disk launching toy oscillates back and forth upon base 20, the frontal end of launcher housing 30 undergoes a corresponding oscillatory side-to-side movement as indicated by arrows 145. Simultaneously, a succession of disks such as disk 58 are launched outwardly in the direction indicated by arrow 107. As launcher housing 30 is moved side-to-side, the sequentially launched disks from launcher housing 30 produce a "spray" of flying disks.

[0058] What has been shown is a novel disk launching toy in which a figure holding the launcher mechanism is pivotally supported upon a base and oscillates side-to-side while the mechanism within the disk launcher produces a stream of disks flying outwardly. Because the housing and toy figure is oscillated side-to-side, the stream of disks assumes a spray-like appearance providing an interesting and amusing effect beyond that realized with conventional disk launching toys.

[0059] While particular embodiments of the invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects. Therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

Claims

1. A disk launching toy (10) comprising:

- a plurality of disks (51);
- a base (20) having a support surface and support means;

- a disk launcher supported above said support surface by said support means, said disk launcher launching a stream of said disks; and
- oscillation means coupled to said support means for oscillating said disk launcher in a side-to-side pivotal motion causing said stream of disks to be sprayed in an angular pattern.

2. The disk launching toy (10) set forth in claim 1 wherein said support means includes a toy figure.

3. The disk launching toy (10) set forth in claim 2 wherein said toy figure includes feet supported on said support surface.

4. The disk launching toy (10) set forth in claim 3 wherein said disk launcher includes a housing and wherein said toy figure appears to hold said housing.

5. The disk launching toy (10) set forth in claim 1 wherein said disk launcher includes:

- a housing (30) defining a launcher channel (32);
- a disk feeder within said channel (32) operative to transfer a single disk (51) from a magazine (50) for storing said plurality of disks to said launcher channel (32); and
- a launcher spring (64) accelerating said single disk (51) from said launcher channel (32).

6. The disk launching toy (10) set forth in claim 5 wherein said disk launcher includes:

- a motor (99);
- a spring pivot plate (70) supporting said launcher spring (64), said spring (64) having a beam portion (67) and an end (66);
- a spring release (80) having an edge (81) for engaging said end (66); and
- gear means (75, 150) driven by said motor (99) for pivoting said spring pivot plate (70) to flex said beam portion (67) and store energy in said launcher spring (64) until said end (66) is withdrawn from said edge (81) to release said beam portion (67),
- said beam portion (67) rapidly straightening and impacting said transferred single disk (51) and driving said transferred single disk (51).

7. The disk launching toy (10) set forth in claim 6 wherein said gear means include:

- a latch plate (75) slidably movable within said housing (30) having a first end pivotally secured to said spring pivot plate (70) and a second end releasably coupled to said motor (99); and
- a return spring (150) coupled to said latch plate

(75) urging said latch plate (75) in a return direction pivoting said spring pivot plate (70) toward returning said end (66) of said launcher spring (64) to engagement with said spring release (80).

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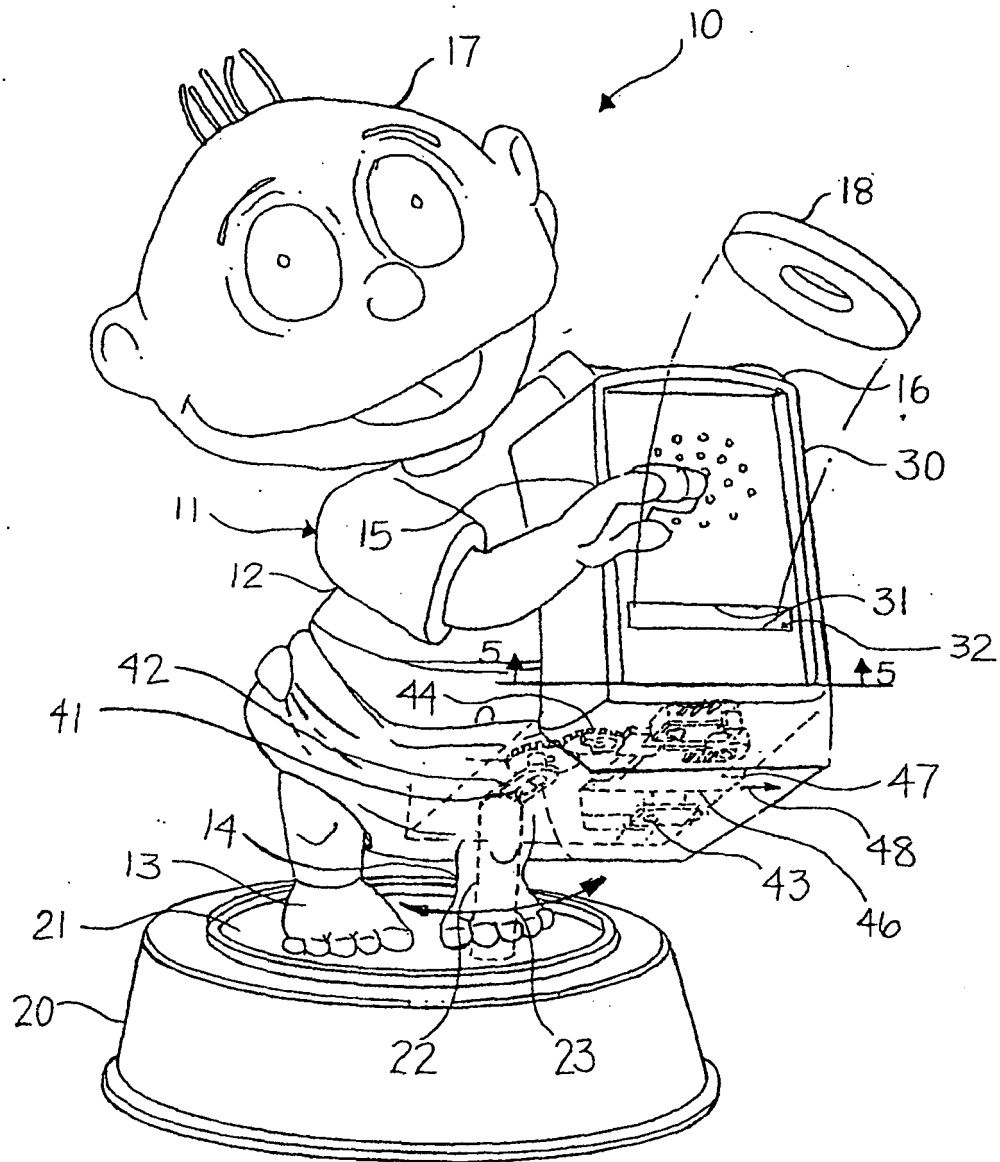
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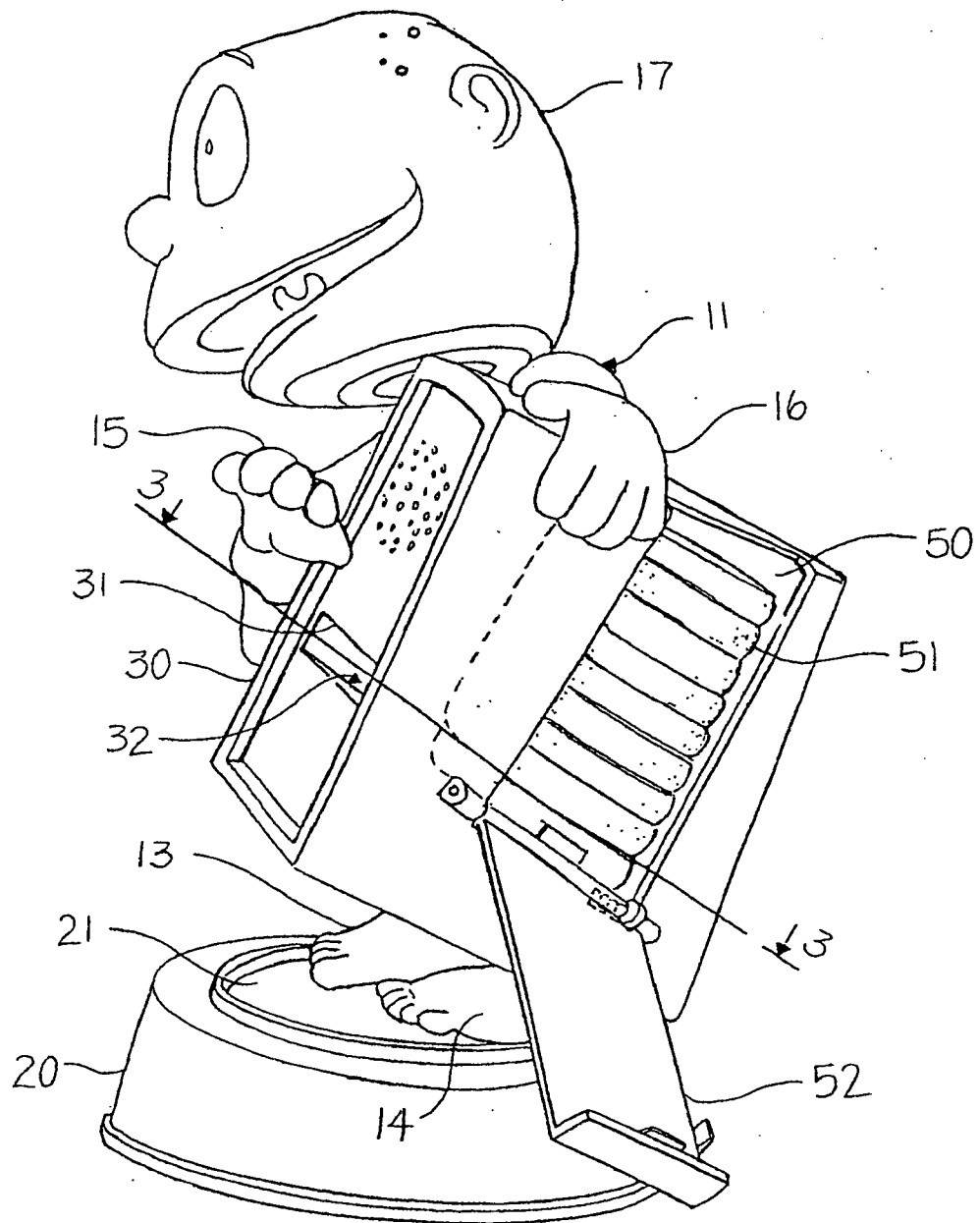
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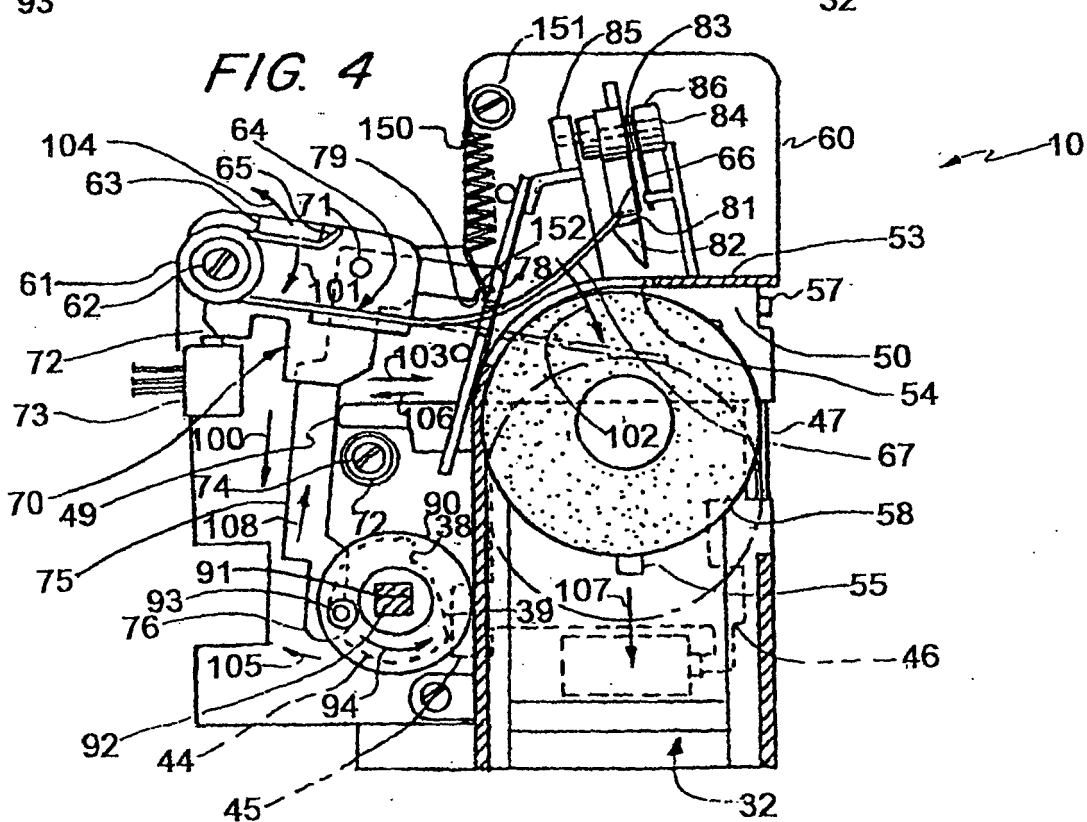
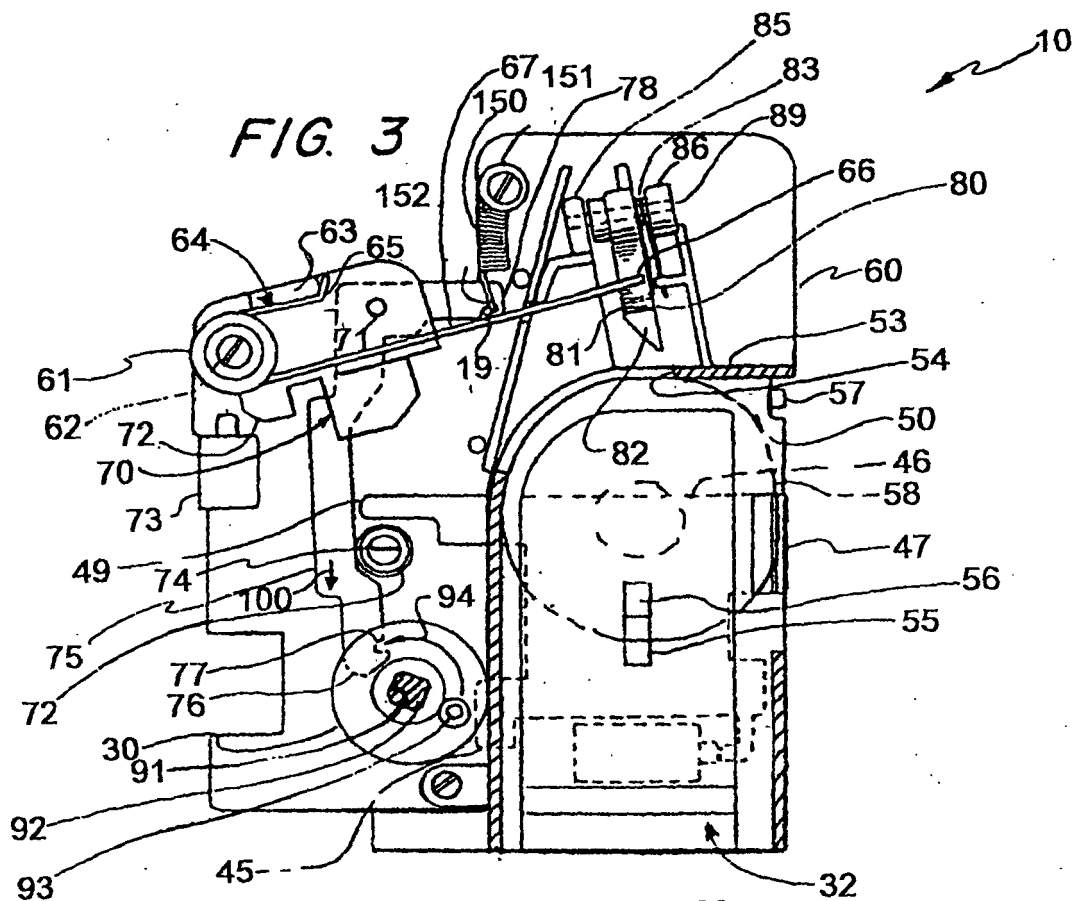
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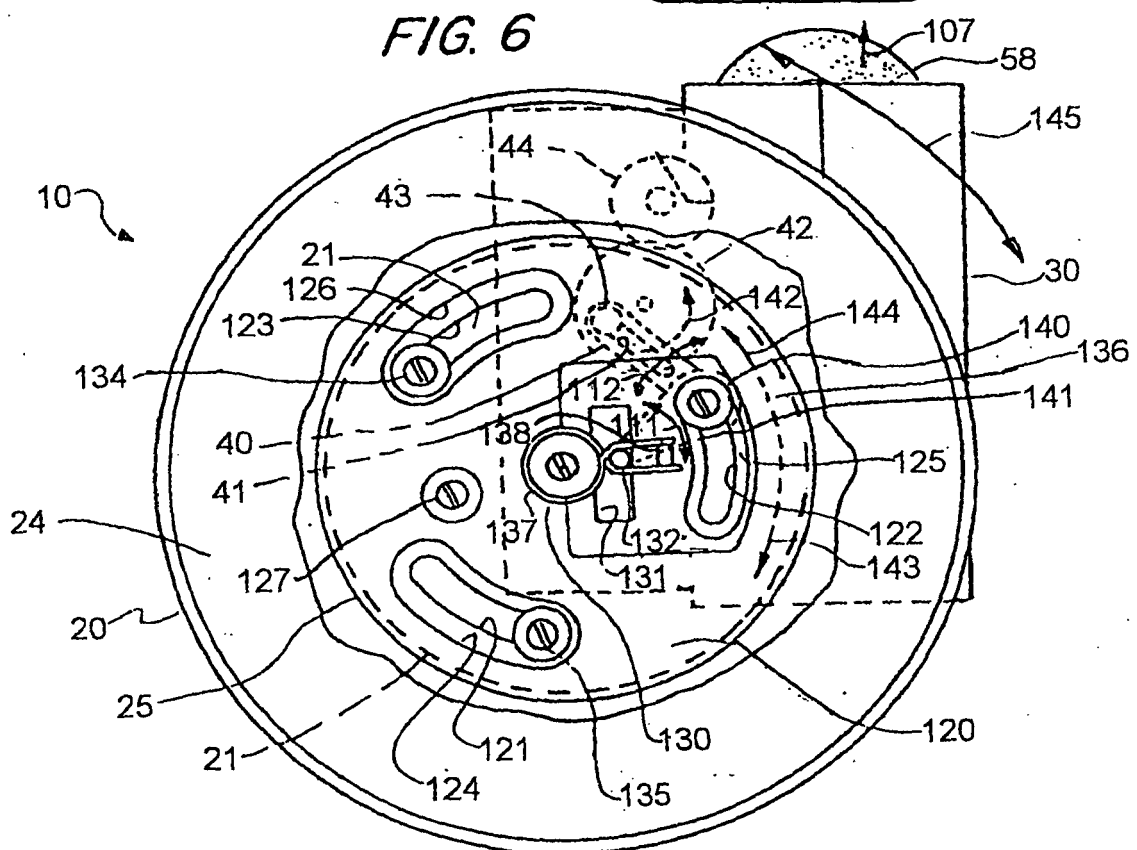
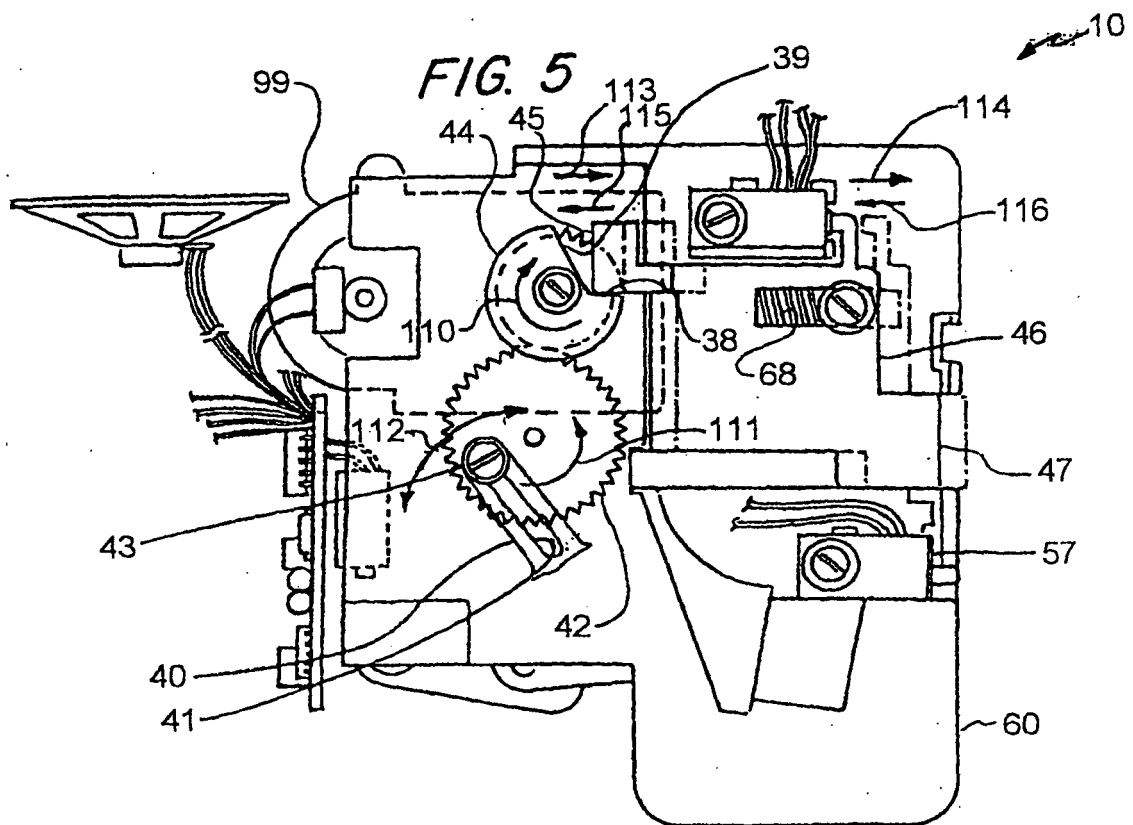
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EUROPEAN SEARCH REPORT

Application Number
EP 05 02 1080

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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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