United States Patent

Johmann

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[45] Aug. 15, 1972

[54] **DICE THROWING DOLL**

[72] Inventor: **Frank T. Johmann,** 49 Hampton Dr., Berkeley Heights, N.J. 07922

[22] Filed: **June 8, 1970**

[21] Appl. No.: **44,063**

[52] **U.S. Cl.**.....**273/145 R,** 46/116, 46/120, 46/247, 273/134 A, 273/134 D, 273/145 A

[51] **Int. Cl.**.....**A63f 9/04**

[58] **Field of Search**.273/145 R, 145 A; 46/116, 117, 46/118, 119, 120, 148, 247

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Primary Examiner—Anton O. Oechsle

[57] **ABSTRACT**

This invention relates to toys. In one aspect, the invention relates to a doll having a movable hand driven by an electric motor, preferably battery operated, which hand can move through a sequence of positions. The doll may be constructed so its hand will shake and throw down a pair of dice placed in its hand, and thus may be part of a game set including a game board, and dice wherein markers are moved on the game board a certain number of spaces determined by throwing dice.

6 Claims, 25 Drawing Figures

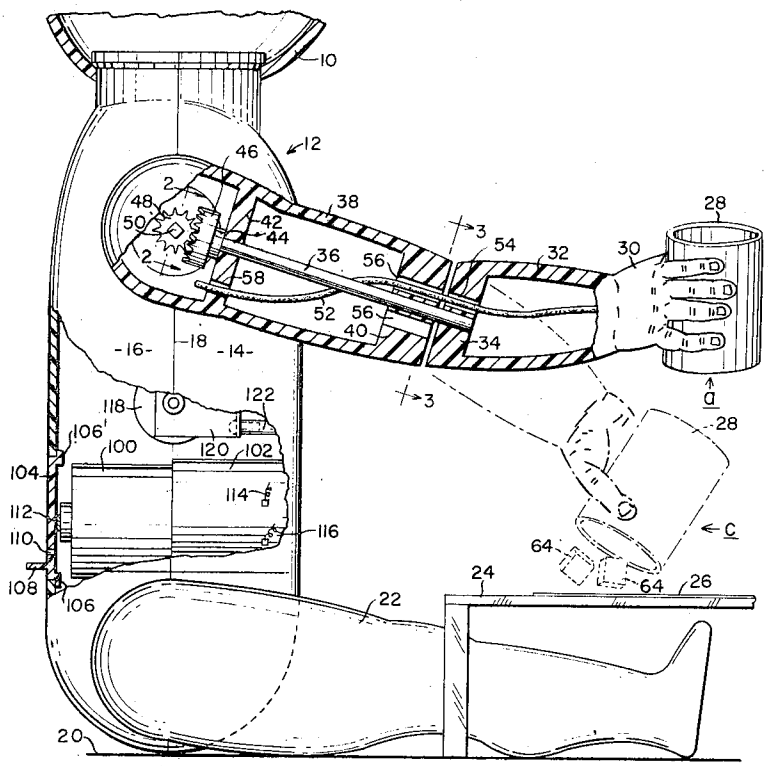
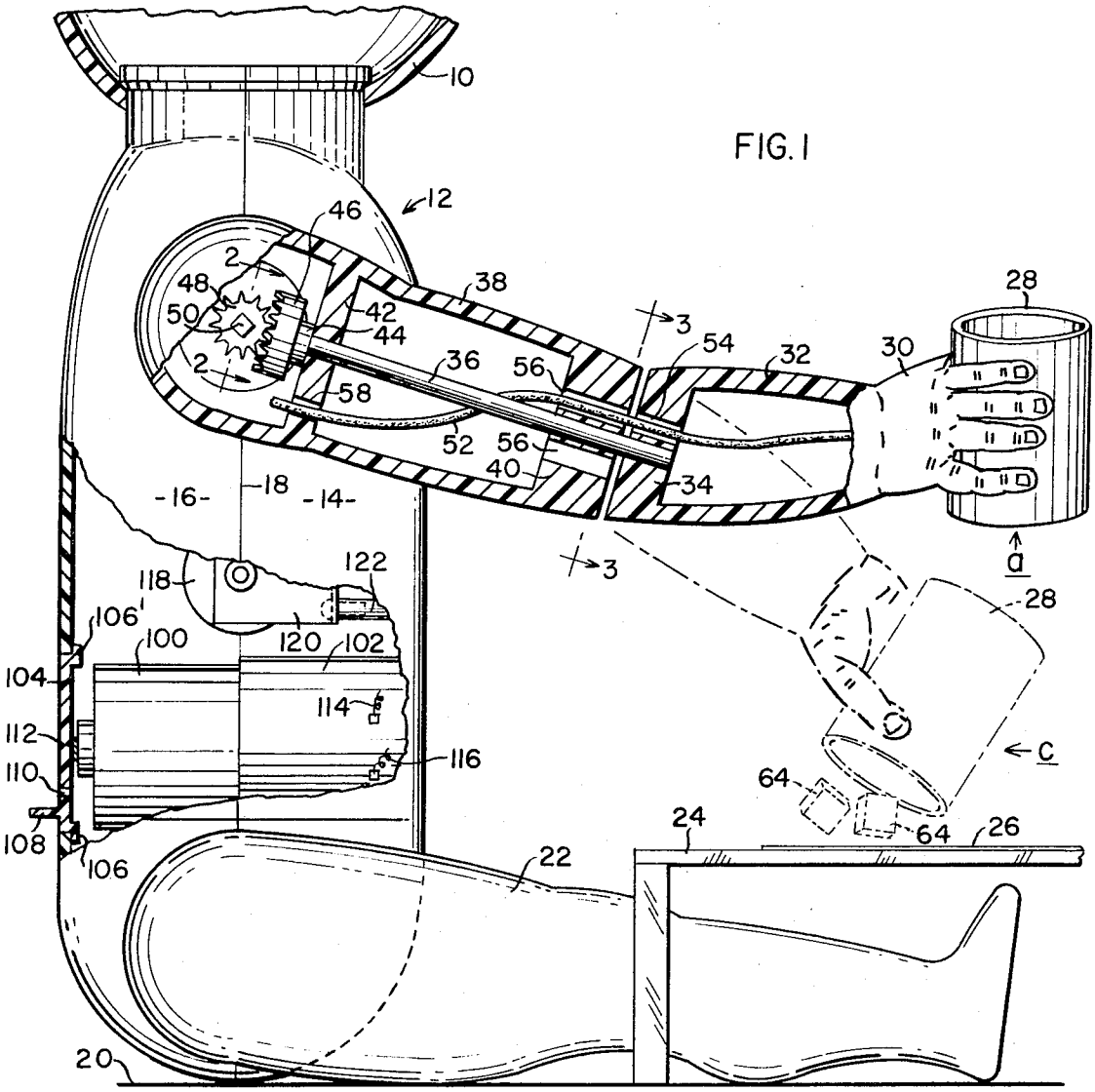


FIG. 1



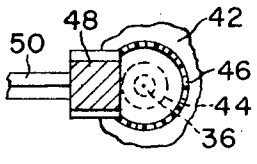


FIG. 2

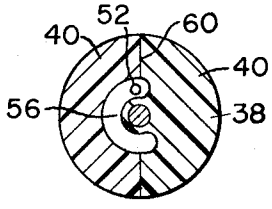


FIG. 3

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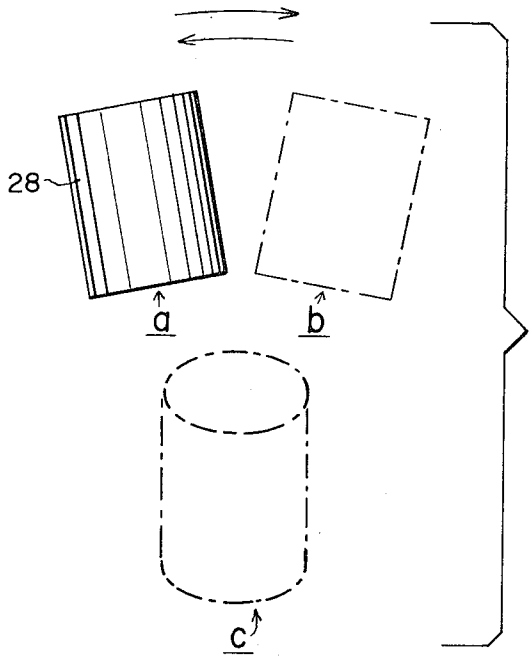


FIG. 4

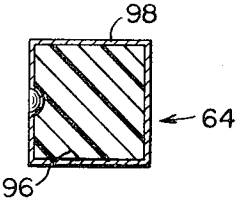
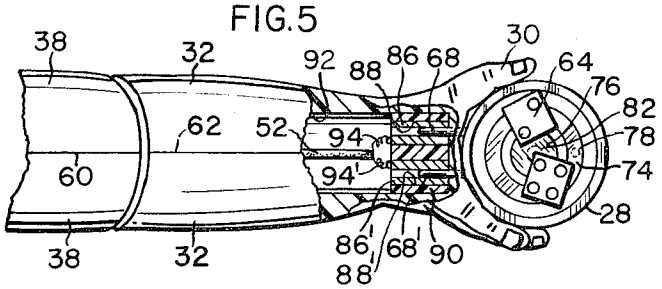


FIG. 7

FIG. 5



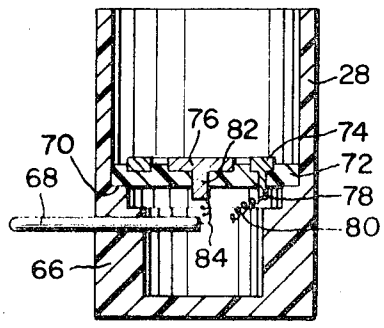


FIG. 6

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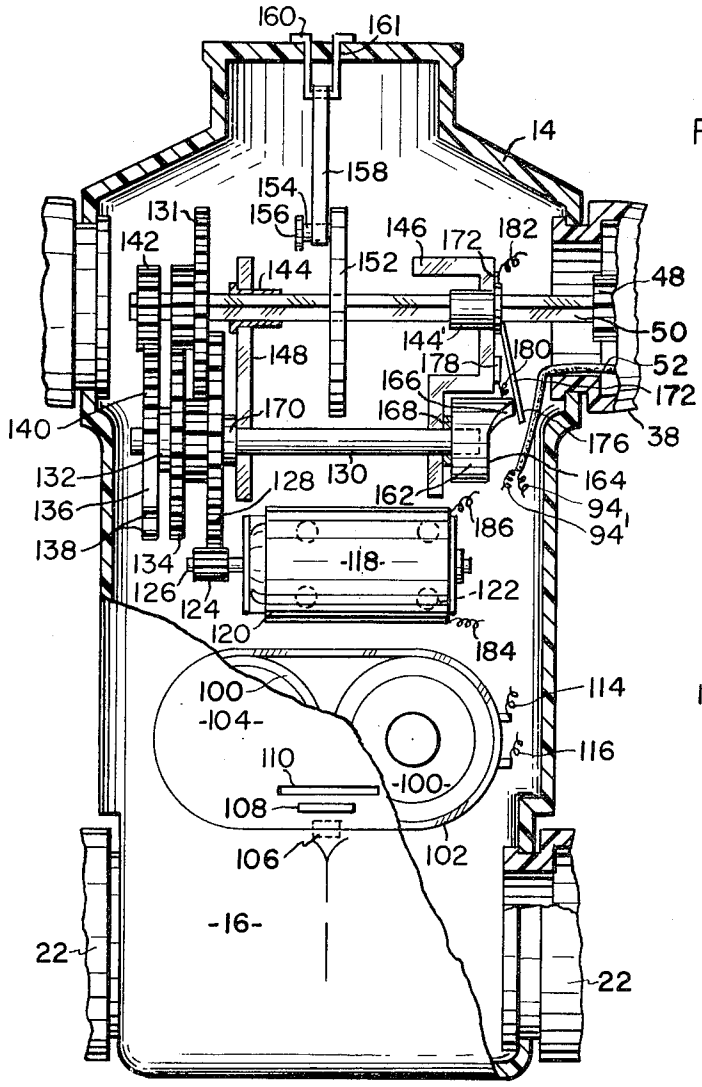


FIG.8

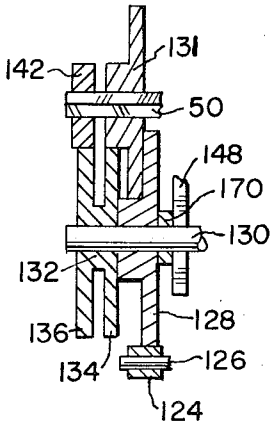


FIG.9

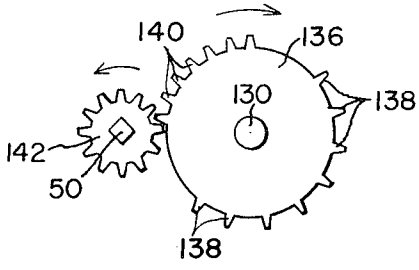


FIG.10

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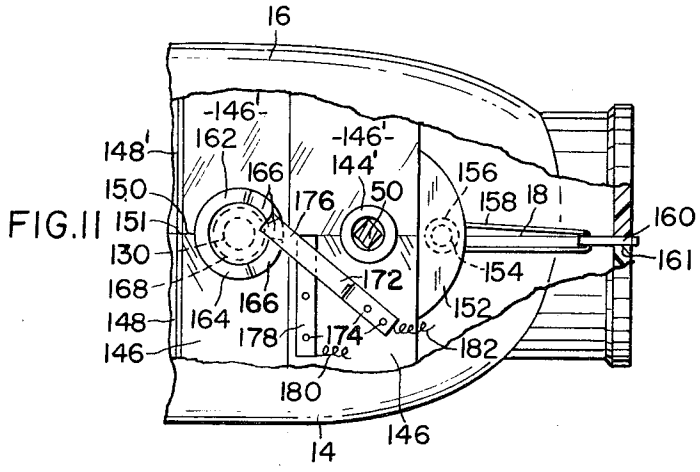


FIG. 11

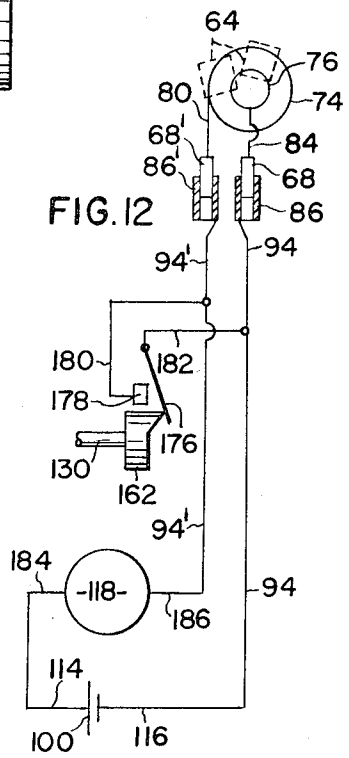


FIG. 12

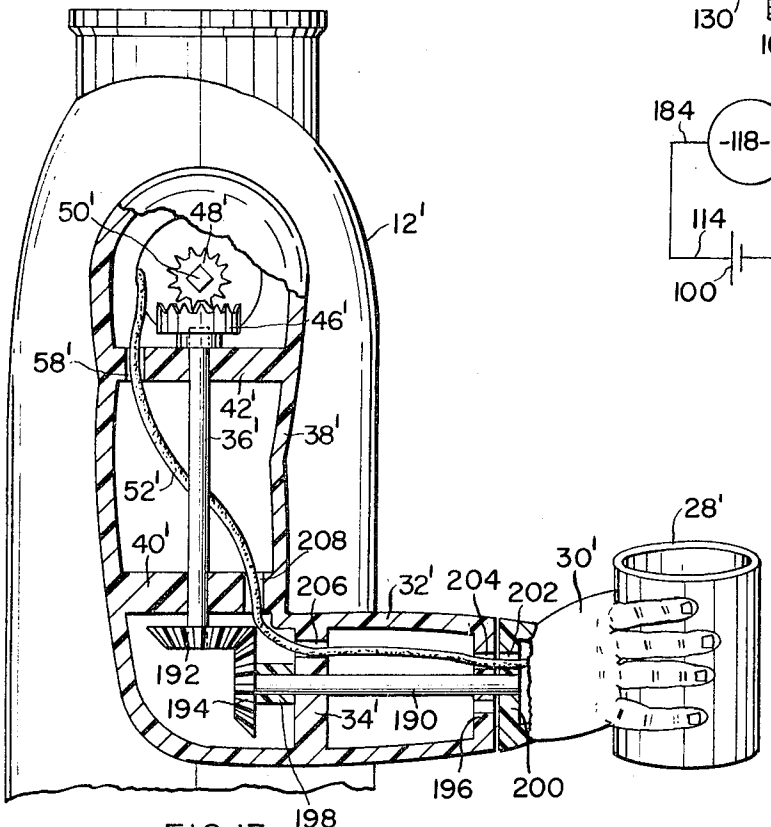
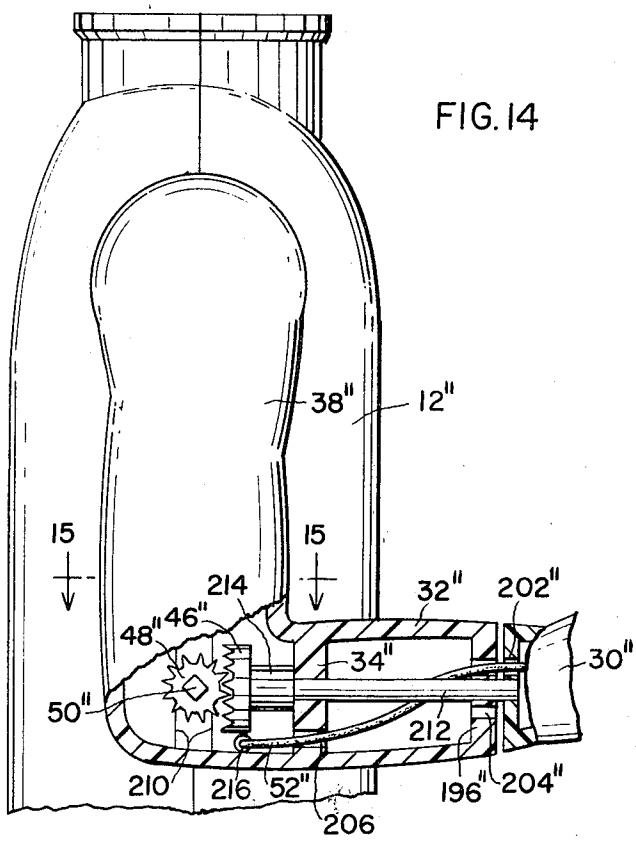


FIG. 13

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FIG. 14



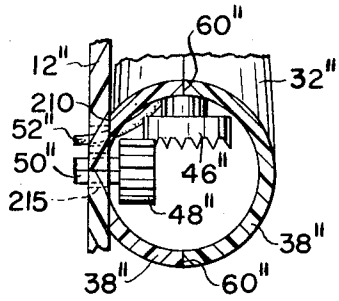
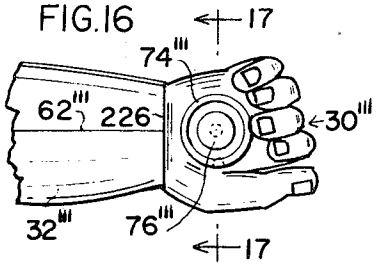


FIG. 15

FIG. 16



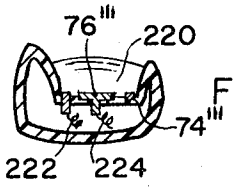
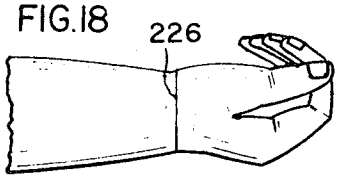


FIG. 17

FIG. 18



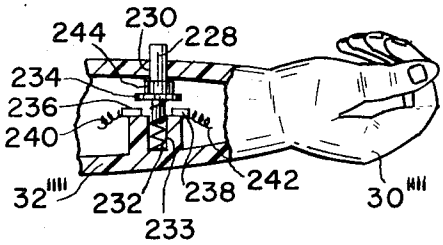


FIG. 19

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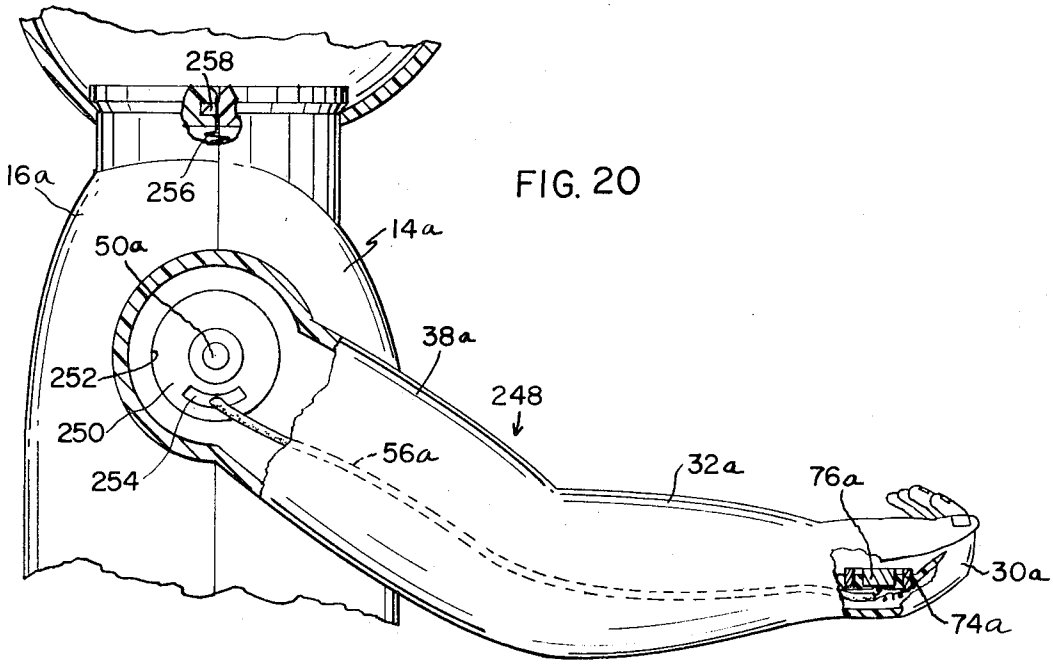
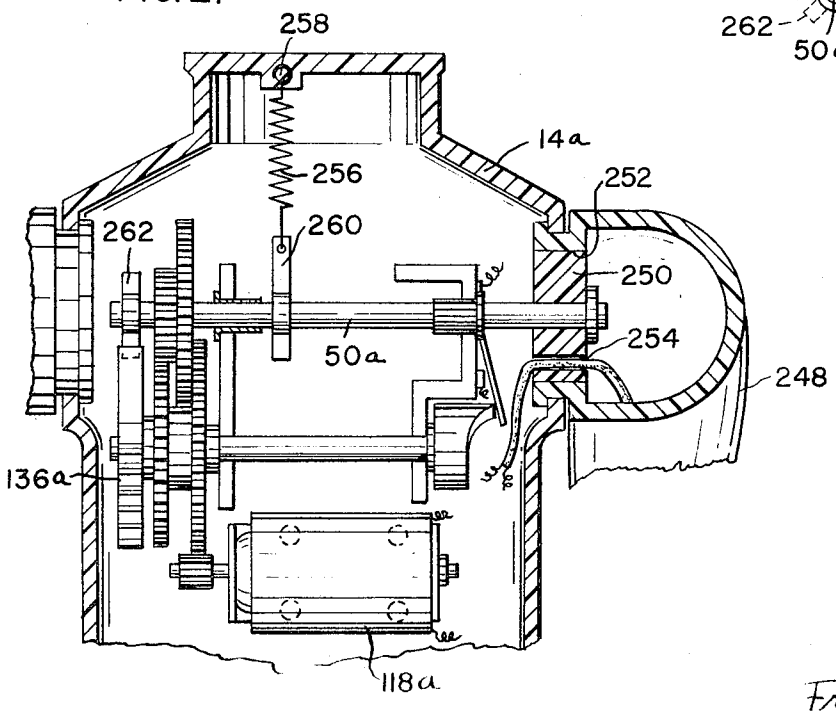


FIG. 20

FIG. 21



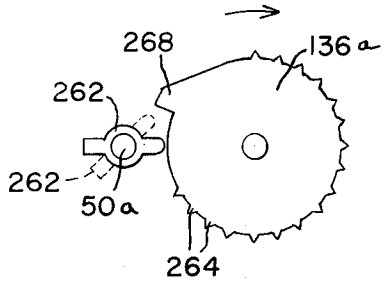


FIG. 22

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FIG. 23

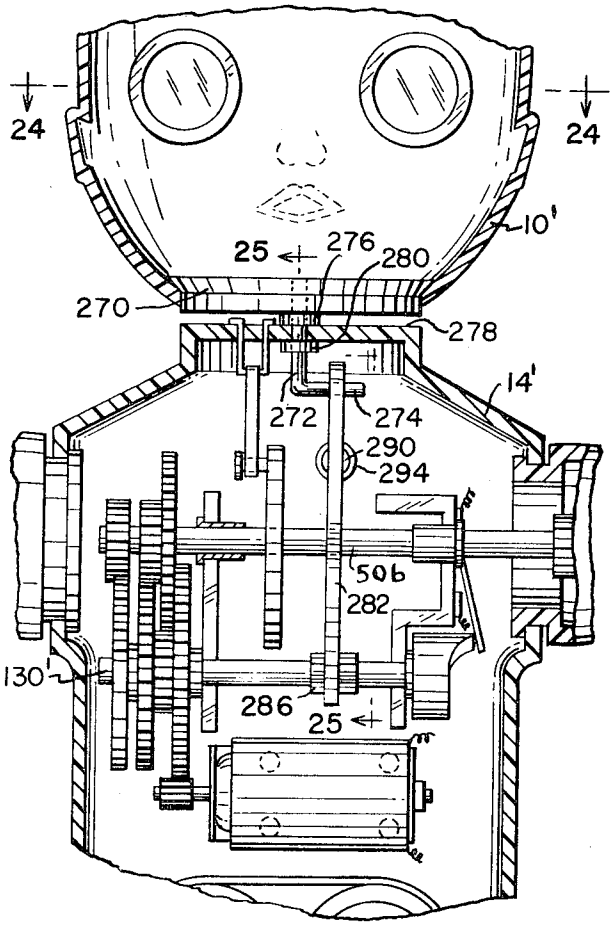
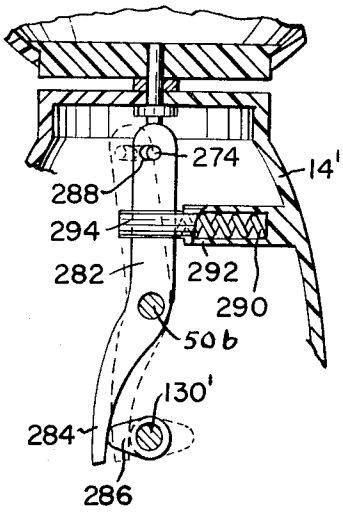


FIG. 25



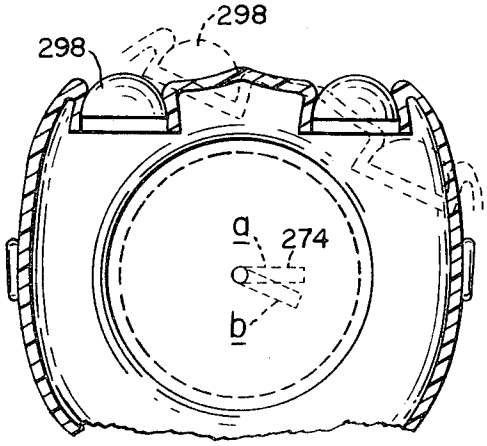


FIG. 24

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DICE THROWING DOLL

SUMMARY OF THE INVENTION

The present invention provides a doll which can take an active part in common children's games. Thus, many games, for example, Pachisi, involve a game board having a pathway divided into a number of segments or squares, over which the players move markers leading from a starting position to a finish point. The players generally alternate in throwing dice to determine a number by chance, followed by moving their marker a number of squares corresponding to said number. Dolls of the invention can be made to shake and throw down dice. For example, a child in playing a board game involving dice, places the dice into the doll's hand, e.g., into a dice cup held in the doll's hand. The doll shakes the dice and throws them down to generate a number, for example, six. The child then moves the doll's marker along the game board the six squares. The child then picks up, shakes and throws down the dice to determine the child's number and accordingly moves her own marker. By alternating with the doll in this way the doll appears to be an active playmate playing the game with the child.

The invention will be further understood by reference to the drawings and following description which includes a preferred embodiment of the invention, and wherein:

FIG. 1 is a side view, partly broken away and in section, showing the doll's right side as she sits in playing position holding a dice cup, and wherein the dot-dash line shows the arm position as she throws down the dice.

FIG. 2 is a fragmentary cross-sectional view taken along the line 2—2 of FIG. 1.

FIG. 3 is a cross-sectional view taken along the line 3—3 of FIG. 1.

FIG. 4 is a schematic-like end view illustrating the various positions of the dice cup when looking towards the front of the doll of FIG. 1.

FIG. 5 is a fragmentary top view, partly in section, of the doll's arm of FIG. 1.

FIG. 6 is a side cross-sectional view of the dice cup.

FIG. 7 is a cross-sectional view of a plastic die having an electrically conducting metal surface.

FIG. 8 is a back view, partly broken away, of the doll's torso illustrating the driving and gear mechanism.

FIG. 9 is a cross-sectional view of the gear train of FIG. 8.

FIG. 10 is a side view illustrating the driving, timing, cam gear and its driven gear.

FIG. 11 is a fragmentary side view, partly broken away, of the upper part of the doll's torso.

FIG. 12 is a schematic electrical wiring diagram of the doll of FIGS. 1 to 11.

FIG. 13 is a fragmentary side view, partly broken away, of a modification of the embodiment of FIGS. 1 to 12.

FIG. 14 is a fragmentary side view, partly broken away, of yet another modification.

FIG. 15 is a sectional view taken along the line 15—15 of FIG. 14.

FIG. 16 is a top fragmentary view of still another modification wherein the doll's hand and fingers are formed to directly hold dice, and automatic switch means are directly in the palm of the hand.

FIG. 17 is a sectional view along the line 17—17 of FIG. 16.

FIG. 18 is a side view of the modification of FIG. 16.

FIG. 19 is a fragmentary side view, partly broken away and in section, illustrating a variation of the starting switch.

FIG. 20 is a fragmentary side view, partly in section, of another modification of the embodiment of FIGS. 1 to 12 wherein the doll's arm moves vertically up and down when shaking the dice.

FIG. 21 is a fragmentary back sectional view of the doll of FIG. 20.

FIG. 22 is a side view of the arm actuating gear.

FIG. 23 is a fragmentary back sectional view of another modification of the doll of FIGS. 1 to 12 wherein the doll's head is pivotally mounted for turning.

FIG. 24 is a cross-sectional view taken along the line 24—24 of FIG. 23.

FIG. 25 is a fragmentary side view illustrating the head moving cam system.

Reference is now made to the drawings in detail. Looking at FIG. 1, a mechanical doll (the normal clothing is removed for clarity) having a head 10, a torso 12 made up of the molded plastic split halves 14 and 16 which are fixed together as by cementing along line 18, is sitting on a floor 20 with her legs 22 extending outwardly under a simple table 24 which supports game board 26. A tubular dice cup 28 is carried by hollow right hand 30 which is integral with the outer end of hollow forearm 32. The inner end of forearm 32 defines end wall 34 in which is fixed the outer portion of cylindrical shaft 36. The right hollow upper arm 38 is fixed to torso 12 and has the outer end wall 40 and the inner wall 42, said walls rotatably supporting shaft 36. Fixed to the inner portion of shaft 36 is the collar 44 of the integral crown gear 46 meshingly engaged with spur gear 48 (also see FIG. 2) fixed onto the outer end of shaft 50 having a square cross section and transversely extending outwardly from torso 12. An electrical insulated cord 52 extends from the hand 30, through forearm 32, through bore 54 in the end wall 34, through a semicircular slot 56 defined in end wall 40 (see FIG. 3) through bore 58 in wall 42, and into the interior of torso 12.

In order to facilitate assembly and to readily form walls 34, 40, and 42, the forearm 32 and upper arm 38 are preferably each molded of plastic in split halves which are cemented together. This is illustrated in FIGS. 3 and 5 where upper arm 38 is formed of two split halves which are cemented together along line 60 and forearm 32 is also formed of halves cemented along line 62.

The dot-dash line in FIG. 1 shows how the forearm 32 can be pivoted about shaft 36 so as to turn dice cup 28 from position *a* upside down into position *c* to thereby throw a pair of dice 64 out onto the game board 26.

FIGS. 5 and 6 illustrate further details of the dice cup 28 and its mounting onto hand 30. Here, the cylindrical cup 28 is formed with a thickened lower side wall portion 66 in which is fixed a pair of metal prongs 68 and 68′ extending through said side portion 66. A plastic, electrical insulating disk 72, fixed within said cup on the annular shoulder 70, fixedly carries the outer metal ring 74 and the inner metal disk 76. A cylindrical por-

tion 78 of outer ring 74 extends through disk 72 and is connected (not shown) by wire 80 to prong 68'. A cylindrical portion 82 of inner disk 76 extends through insulating disk 72 and is connected by wire 84 to prong 68.

The whole cup assembly can be detachably plugged into the doll's hand 30 as shown in FIG. 5. Here, prongs 68 and 68' frictionally fit within metal tubes 86 and 86' fixed within tubular bores 88 and 88' defined within plastic tubular member 90 which in turn is fixed within bore 92 of the forearm 32. Electrical leads 94 and 94', extending from cord 52, are soldered to metal tubes 86 and 86' respectively.

In operation, dice 64 which can be metal, or can have a plastic core 96 covered with metal 98 as shown in FIG. 7, so as to conduct current are placed into the dice cup 28 where they will initially lay across ring 74 and disk 76. Dice 64 will then conduct electricity from ring 74 to disk 76 thereby acting to close an electrical switch defined by ring 74 and disk 76 to complete an electrical circuit and thus send an electrical signal back through the doll's arm to the mechanism in the torso which actuates the doll.

The mounting of the batteries and motor is apparent from FIGS. 1 and 8. Batteries 100 are mounted in battery holder 102 molded integrally with the front half section 14. A removable cover plate 104 fits in a complementary opening in the doll's back and is held in place against batteries 100 by oppositely disposed locking tabs 106 and 106'. Cover plate 104 also has an outwardly projecting tab 108 adjacent the slot 110. Cover plate 104 is molded of a slightly resilient plastic so that the tab 108 can be pushed upwardly towards the head 10 so as to move locking tab 106 also upwardly and out from engagement with the inside of the torso 12. In this way, the cover plate 104 can be removed to allow the change of batteries 100, while it will be apparent that the cover plate 104 can be readily snapped back in place atop fresh batteries. A conventional type of metal contact 112 (FIG. 1) connects the two batteries 100 in series. Electrical leads 114 and 116 extend from the battery holder 102 in a conventional manner. The batteries 100 operate electrical motor 118 mounted on a channel-shaped frame 120 which is bolted to plastic bosses 122 extending inwardly from the front of torso 12.

The gear system is illustrated in FIGS. 8 to 10. Here, the small spur gear 124 carried on the rotatable shaft 126 of the motor 118, meshingly engages and turns spur gear 128 which is loosely mounted on shaft 130. Gear 128, in turn, drives gear 131 which is loosely mounted on shaft 50. Gear 131 drives timing gear 132. However, gear 132 has two gear portions, namely 134 and 136. Portion 134 has a full set of gear teeth. Portion 136, which serves as a cam is illustrated from the side in FIG. 10, has intermittent gear teeth 138 and a series of adjacent teeth 140, said teeth serving as cam projections for periodic engagement with driven gear 142 which serves as a cam follower. Gear 142 is fixed on shaft 50 having a square cross section so as to better prevent the possibility of gear 142 slipping on shaft 50. Shaft 50 is fixed within the tubular eyelets 144' and 144 carried respectively by the plastic supporting walls 146 and 148 which are integral with and extend inwardly from torso front half section 14. Similar, but opposing, walls 146' and 148' are integral with and extend inwardly from torso back half section 16, (see FIG. 11). These walls are formed with appropriate recesses for reception of shaft 130 and eyelets 144 and 144' so when the two torso halves 14 and 16 are cemented together along line 18, walls 146 and 146' abut along line 150 (see FIG. 11), while walls 148 and 148' abut along line 151, thus enclosing shaft 130 and eyelets 144 and 144', while however allowing shafts 130 and 50 to rotate.

Shaft 50 has fixed thereon the disk 152 having the boss 154, with head 156, which carries an elastic tension member, e.g., a rubber band 158, which is also held on the hook 160 held in recess 161 by abutment of torso halves 14 and 16 (FIGS. 8 and 11). Shaft 130 has fixed on one end the conjointly rotatable, non-conducting, cam 162 having an annular rim 164, a portion of which is raised at 166. Washers 168 and 170 on shaft 130 help reduce friction and act as spacers. The resilient metal cam follower 172 fixed proximate its outer end to wall 146 by rivets 174 has an inner free end 176 which is spring-like and moves either into electrical-conducting contact with the metal terminal strip 178, also fixed by rivets 174 to wall 146, or away from said contact as it presses against and follows the surface of cam annular rim 164. Electrical lead 182 extends from strip 172 while lead 180 extends from terminal 178.

The operation of the doll of FIGS. 1 to 12 will now be described. Dice 64 are dropped into cup 28 which the doll is holding upright in position *a* of FIGS. 1 and 4. The cycle is started by said dropping of dice 64 into the dice cup, which has a diameter so that the dice 64 will lay across the switch terminals, i.e., ring 74 and disk 76 (see FIG. 12). As seen by FIG. 12, current will then flow from battery 100, through lead 116, lead 94, plug receptacle 86, plug 68, lead 84, disk 76, across dice 64, to ring 74, then through lead 80, plug 68', plug receptacle 86', lead 94', lead 186, motor 118, lead 184, and finally lead 114 to battery 100.

As motor 118 turns in response to said current flow, it rotates the gear train 128, 131 and 132 which reduces the high speed of the motor to a relatively slow, but strong, rotation of timing drive gear 136, e.g., gear 136 will now rotate one revolution in say about 3 to 10 seconds, i.e., about the length of time one would normally spend in shaking and throwing the dice. As the driving gear 136 slowly rotates in the clockwise direction of the arrow (FIG. 10) the first of the individual circumferentially spaced teeth 138 will come into engagement with driven gear 142 thereby causing said gear 142 to rotate counterclockwise, which in turn rotates the conjointly rotatable shaft 50 against the tension of rubber band 158 which now begins to stretch. As soon as said first of said teeth 138 passes out of engagement with the meshing teeth of driven gear 142, said gear 142 and shaft 50 snap back to their original position under the return action of rubber band 158. This sequence of partial rotation (about 30° rotation, i.e., 360° divided by the 12 teeth of gear 142) of driven gear 142 counterclockwise, and its snap-back to its original starting position is repeated as each of the eight teeth 138 individually passes into and out of engagement with gear 142. Finally, the series of seven adjacent teeth 140 come into engagement with driven

gear 142 to rotate gear 142 through about 210 angular degrees against the tension of rubber band 158 before passing out of meshing engagement, whereupon driven gear 142 again snaps back to its original position as rubber band 158 also contracts to its original position. It is thus seen that driven gear 142 has been rotated back and forth eight times through a relatively short distance approximately about 30° each time and through approximately 210° one time as driving gear 136 make a complete cycle or revolution. Reference is now made to FIGS. 1 and 4. The doll, at the start of said cycle, is holding the dice cup 28 in position *a*. Now, during each of the aforesaid back and forth partial rotation movements of about 30° each of driven gear 142, this partial rotation is transmitted through shaft 50, to spur gear 48, and then to crown gear 46 which rotates shaft 36 back and forth so that the cup 28 rocks sideways, or oscillates (see FIG. 4) from position *a* to *b* and then returns to *a*, for a total of eight times. When finally driven gear 142 rotates through the aforesaid approximate 210°, the shaft 36 is correspondingly rotated so that forearm 32 is rotated roughly through about 210° to thereby assume the dot-dash position of FIG. 1 to throw down the dice 64 (cup 28 is now in position *c* of FIG. 4). On the return action under the action of rubber band 158, forearm 32 returns to the solid line position of FIG. 1 and cup 28 moves from *c* back to position *a* and the cycle is over.

Reference is now made again to the schematic design of FIG. 12 and FIGS. 8 to 11 since the wiring system will be further discussed. As previously noted, dropping dice 64 into cup 28 completes a circuit which starts motor 118, which in turn, starts timing gear 136 rotating. As gear 136 rotates, it in turn, rotates shaft 130 to which it is fixed, which rotates cam 162. As cam 162 rotates, the outer portion of flexible contact strip 176 moves into contact with terminal strip 178 so that current can now flow (FIG. 12) through the circuit 100, 116, 94, 182, 176, 178, 180, 186, 118, 184, 114 back to 100. At this point, the operation of motor 118 is no longer dependent on the dice 64 laying across switch members 76 and 74. The cam 162 is preferably arranged relative to driving gear 136 so that the first of the teeth 138 does not come into contact with driven gear 142 until after the cam 162 permits contact strip 176 to contact terminal strip 178. The reason for this is that the shaking of dice 64, and possible disruption of the current if dice 64 break contact with switch members 74 and 76, is avoided until the operation of motor 118 is not longer dependent on the dice 64 making said contact. As driving gear 136 completes its rotation and the dice 64 are thrown down, cam 162 rotates to the point where its raised surface 166 raises the cam follower strip 176 out of contact with terminal strip 178 to thereby break the circuit and stop the motor, thereby completing the cycle. The assembly then assumes once again the starting position shown in FIG. 8.

FIG. 13 represents another embodiment of the doll which is similar to the embodiment of FIGS. 1 to 12 and wherein numbers with prime marks are used to designate the same or similar parts. Here, the fixed upper arm 38′ and forearm 32′ are integral and are at substantially right angles to each other, while the hand 30′ is fixed on rotatable shaft 190 for the shaking and turning over movement.

Spur gear 48′, carried on square shaft 50′, engages crown gear 46′ fixed on shaft 36′ rotatably supported by walls 40′ and 42′ of the fixed vertical upper arm portion 38′. Bevel gear 192, fixed on the lower end of vertical shaft 36′, meshingly engages the bevel gear 194 fixed on the inner end of horizontal shaft 190 which is rotatably supported by walls 34′ and 196 of forearm portion 32′. Tubular spacer 198 acts as a washer and also spaces the gear 194 away from wall 34′. The outer end of shaft 190 is fixed within rear wall 200 of hand 30′ which carries dice cup 28′. The cord 52′ passes from hand 30′ through bore 202, the semicircular slot 204 (similar to slot 56 of FIG. 3,) the bores 206, 208, and 58′, and finally passes into the interior of torso 12′.

The operation of the embodiment of FIG. 13 is similar to that of FIGS. 1 to 12. Thus, placing the electrically conducting dice 64 in cup 28′ generates a starting electrical signal which is carried back through cord 52′ into the doll's body 12′ which causes the gear 48′ to rotate through the same sequence of back and forth movements as described in the embodiment of FIGS. 1 to 12. These back and forth partial rotary movements are transferred to gear 46′, then to shaft 36′, gear 192, gear 194, and finally to shaft 190 which causes hand 30′ and cup 28′ to first shake back and forth (i.e., movement from position *a* to *b* then back to *a* of FIG. 4) and then finally causes hand 30′ and cup 28′ to rotate about their horizontal axis through about said 210° angle (position *a* to position *c* of FIG. 4) to dump out the dice and then return to their original starting position to thereby complete the cycle.

FIGS. 14 and 15 represent another embodiment which is similar to the embodiment of FIG. 13 but which is more simple. Here, the upper arm 38″, made up of the cemented halves joined along line 60″, is fixed to the torso 12″, as by cementing at 210, while the forearm 32″ integral with said upper arm extends forwardly and away from torso 12″. Hand 30″ is fixed on the outer end of shaft 212, which is rotatably journaled by walls 34″ and 196″ of forearm 32″. Fixed to the inner end of shaft 212 is the crown gear 46″ spaced outwardly from wall 34″ by the tubular collar 214 and into meshing engagement with spur gear 48″ fixed on shaft 50″ extending through the opening 215 (see FIG. 15) in the walls of the torso 12″. Cord 52″ carrying the electrical signal from hand 30″ extends through bore 202″, the semicircular slot 204″ and bore 206″, and then passes through aperture 216 into the interior of the torso 12″. Hand 30″ goes through the same rocking and throwing down movements of hand 30′ of FIG. 13 since shaft 50″ and gear 48″ go through the same sequence of movements previously described with relation to the embodiments of FIGS. 1 to 12 and FIG. 13. Although not shown, it will be apparent that the motor, batteries, gear system, etc., of the embodiment of FIGS. 14 and 15 are simply rearranged in the doll's torso from the location shown in the prior embodiments of FIGS. 1 to 13 so that shaft 50″ extends from the torso 12 proximate the doll's elbow rather than from the doll's shoulder.

FIGS. 16 to 18 represent a variation of the embodiment of FIGS. 1 to 12, wherein the aforedescribed dice cup is eliminated and the forearm 32‴ and hand 30‴ are modified so that the dice can be carried directly in the doll's hand which is formed to define a cup-like

recess 220. In the palm of hand 30''' are fixed the electrically conducting ring 74''' and disk 76''' connected to leads 222 and 224 (which correspond to leads 94 and 94' of FIGS. 1 to 12). The forearm 32''', is made up of two sections joined along line 62''', in turn joined to the hollow hand 30''' along line 226. Hand 30''' can be molded in one-piece. The fingers are shaped so as to tend to enclose the dice within the hand, yet permit the dice to fall out of the hand when the hand turns upside down. Operation of the doll is the same as described with regard to the embodiment of FIGS. 1 to 12 except that the starting signal is given by placing the dice 64 in the hand to close the switch defined by members 74''' and 76'''. FIG. 19 represents still another variation of the hand of the embodiment of FIGS. 1 to 12. Here hand 30'''' is shaped to hold the dice, while the mechanism is actuated by momentary depression of pushbutton 228, extending through bore 230 in arm 32'''', downwardly against the pressure of compression spring 232 whereupon the metal conducting ring 234 fixed to said pushbutton contacts the terminal strips 236 and 238 connected to lead wires 240 and 242 (which correspond to leads 94 and 94' of FIGS. 1 to 12). Release of the pushbutton 228 enables the spring 232 seated in bore 233 to expand, pushing the pushbutton 228 upwardly until its collar 244 seats against the underside of arm 32'''' thereby raising ring 234 from contact with the terminal strips 236 and 238 to thereby break the circuit. It will be apparent that in this embodiment, the aforedescribed dice 64 having an electrically conducting surface are not necessary. Rather, ordinary non-conducting plastic dice can be used since the initial start-up of the motor is by operation of pushbutton 230, rather than the automatic start-up that occurs when the metal-surfaced dice are used in the manner previously described.

Another modification of the embodiment of FIGS. 1 to 12, is shown in FIGS. 20 to 22. Here, the right arm 248 is of a one-piece hollow construction including a hand 30*a*, forearm 32*a* and upper arm 38*a*. A tubular plug 250 is fixed to arm 248 within the annular opening 252 of the upper arm 38*a*. An arcuate slot 254 formed in plug 250 allows passage of the electrical cord 56*a* whose outer lead are wired respectively to disc 76*a* and the concentric outer ring 74*a*, which disc and ring are embedded or fixed in the soft plastic or rubber making up the doll's hand 30*a*, which hand 30*a* is similar to that previously described in FIGS. 16 to 18. Tubular plug 250 engages shaft 50*a* so that arm 248 and hand 30*a*oscillate when shaft 50*a* rocks or oscillates. Helical tension spring 256, has its upper end looped around a boss 258 formed integrally with the front torso section 14*a*, which boss projects into a complementary recess formed in rear torso half 16*a* to thereby fix the end of said spring 256. The lower end of said spring 256 passes through an aperture formed in the lever 260 fixed onto shaft 50*a*. A cam follower 262, fixed on shaft 50*a*, is engageable with the small teeth 264 of the timing or cam gear 136*a*. Teeth 264, upon rotation of wheel 136*a*, impart a rocking or vibratory motion to shaft 50*a* as said teeth 264 each individually engage and partially rotate cam follower 262 against the return pressure of relatively strong coil tension spring 256, which spring subsequently returns said follower 262 to its original position upon release of said follower 262 from said engagement with teeth 264. A larger cam tooth 268 engages follower 262 near the end of the cycle to impart a relatively large degree of annular rotation to said follower 262 as shown by the dotted lines in FIG. 22. This results in arm 248, which is movable with shaft 50*a*, being pivotally moved through a relatively large angle and then suddenly released as tooth 268 passes out from engagement with cam follower 262 and spring 256 snaps shaft 50*a* and cam follower 262 back to their original position.

In operation, a metal-conducting object, for example electrically conducting dice of FIG. 7, are dropped into the doll's hand 30*a* to close the circuit between ring 74*a* and disc 76*a* to thereby activate the motor 118*a* and produce shaking short up-and-down vertical movements to hand 30*a*, which is now holding the dice, as small cam teeth 264 engage and disengage from cam follower 262. Finally hand 30*a* is moved through a relatively large arc against the bias of spring 256, and suddenly released to thereby result in a throwing action wherein the dice in hand 30*a* will now be thrown completely out of hand 30*a*, for example onto a game board.

As seen by the preceeding embodiment, a simple version of the doll can be produced whose operation is similar to the embodiment of FIGS. 1 to 12 except that a vertical shaking and throwing motion is obtained, rather than the rotary shaking and throwing motion of FIGS. 1 to 12, and the dice are held directly in the hand rather than in a dice cup.

FIGS. 23 to 25 illustrate another modification of the embodiment of FIGS. 1 to 12 wherein there is provided additional mechanism whereby the doll's head 10' turns to look towards her right hand and then returns to its original position of looking straight ahead. In this manner the doll appears to glance at the dice that she is shaking in her hand, thus appearing more life-like and natural. Specifically, head 10' is fixed on neck disk 270 in which is fixed the upper end of pivot member 272 defining the transversely projecting lever arm 274. Washer 276, surrounding pivot 272, acts as a spacer between disk 270 and the neck portion 278 of the doll's torso. Annular flange 280, integral with pivot 272, bears against the underside of neck portion 278 to hold pivot 272 from upward movement. Lever 282, pivotally and loosely mounted on shaft 50*b* for independent movement relative to said shaft, 50*b*, has its lower cam follower portion 284 bearing against cam 286 fixed on shaft 130'. The upper portion of lever 282 is formed with a transversely extending aperture, or slot, 288 through which arm 274 loosely projects. Coil compression spring 290, has its outer portion disposed within the tubular boss 292 molded integrally with the doll's front torso section 14', while its inner end bears against said lever 282 to maintain cam follower portion 284 in sliding engagement with cam 286. The upper portion of tubular boss 292 is slotted so as to form a pair of ears 294, disposed on either side of lever 284, which act as guides to maintain said lever from shifting transversely on shaft 152'. During operation of the dice throwing mechanism previously described with regard to the embodiment of FIGS. 1 to 12, then as shaft 130' slowly rotates, it, in turn, rotates cam 286 fixed on shaft 130'. Cam 286 moves lever 282 between its normal position (as shown in FIG. 25 by solid lines, wherein the doll

head 10' is looking straight ahead) to the dotted line position of FIG. 25 as cam 286 moves to its dotted line position of FIG. 25. This results in moving lever arm 274 from position *a* to position *b* of FIG. 24, which, in turn, rotates the head 10' so that face and eyes 298 are now in the dotted line position of FIG. 24 and appear to be looking towards the doll's right hand. As cam 286 further rotates, the doll's head will slowly turn back under the action of spring 290 to its normal position looking straight ahead.

In summary, the present invention provides a doll which has a hand adapted to move between a position wherein the hand receives and holds dice, or at least one die, and a second position wherein the die is discharged, i.e., either dropped or thrown from her hand. These two positions may be different positions, as in FIG. 1, or they may even be the same position as shown by the embodiment of FIGS. 20 to 22. The hand may be adapted to hold the die either by placing a dice cup, e.g., cup 28 of FIG. 1, in the doll's hand, or by shaping the hand to hold the die directly. If a dice cup is used, it is preferably removable from the doll's hand so that the child can play with the doll in a conventional manner when not playing a die throwing type game. Thus, the removable dice cup having prongs 68—68' can be simply plugged into the hand 30 for playing such a game, and then unplugged for conventional play. Preferably, the doll is constructed so as to first shake, i.e., rock or oscillate its hand, and then discharge the dice so as to appear more life like.

I claim:

1. A battery-operated dice-throwing doll comprising a torso; an arm carried by said torso terminating in a hand adapted to receive and hold a die, said hand being rotatably movable between: a first position for receiving and holding said die, and a second upside down position whereby said die will fall from said hand; an electric motor; and actuating means including cam means driven by said motor and cam follower means engagable with said cam means and connected to said hand, said actuating means generating a series of small oscillations followed by a large oscillation, said small oscillations causing said hand to partially rotate back and forth while substantially in said first position, said large oscillation causing said hand to rotate from said first position to said second position and return; and switch means carried by said hand responsive to placing a die in said hand to start said motor.

2. A doll according to claim 1, wherein said hand is adapted to receive and hold said die by means of a dice cup detachably attached to said hand.

3. A doll according to claim 2, wherein said hand defines a pair of electrically conducting bores and said dice cup defines a pair of electrically conducting prongs frictionally insertable into said bores for detachably attaching said cup to said hand, and wherein said switch means is defined by said cup and is electrically connected to said prongs.

4. A doll according to claim 1 wherein said hand is shaped to define a cup-like recess for receiving and holding a die.

5. A doll according to claim 1, wherein said switch means includes a pair of terminals carried in the doll's hand and an electrically conducting die which connects said terminals when placed in said hand when in a die receiving position.

6. A doll according to claim 1, which includes a head pivotally mounted on said torso for a turning movement, and head turning means operated by said motor which turns said head to look towards said hand and then to look away from said hand.

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