April 8, 1969 H. L. DEKAN 3,436,859

SPLASHING DOLL

Filed Jan. 31, 1967 Sheet 1 of 2

Fig 3

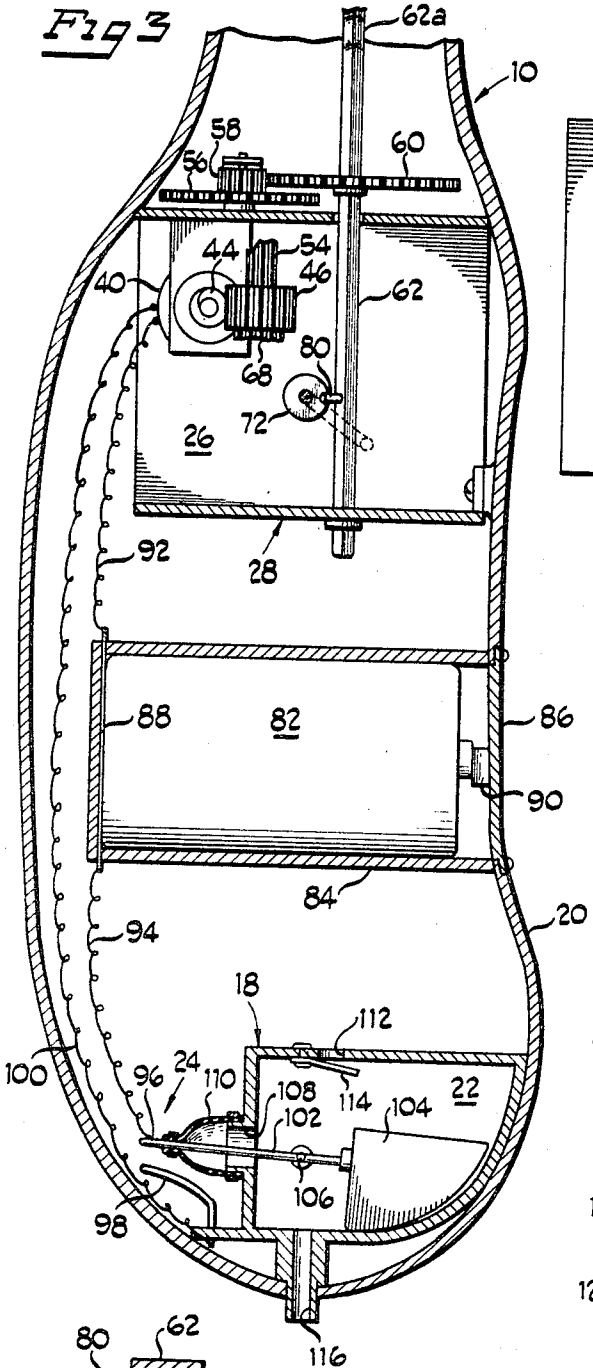
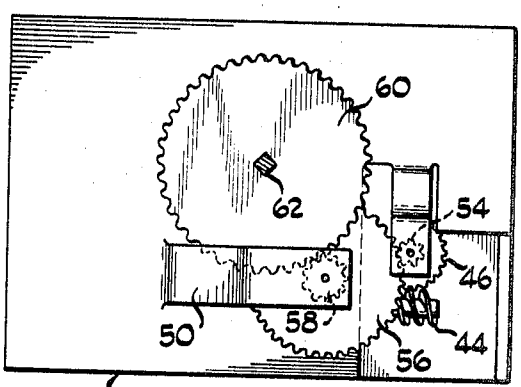


Fig 4



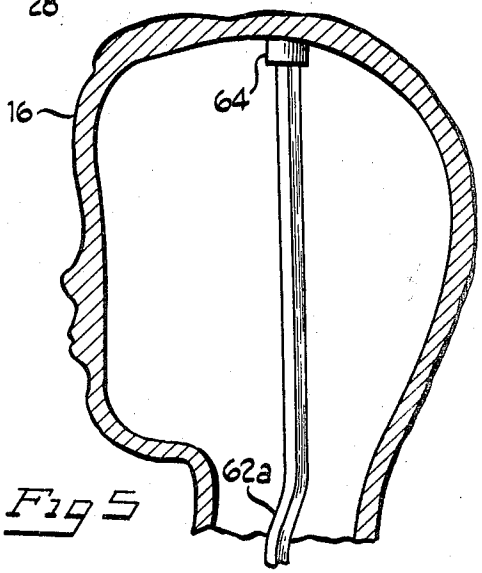


Fig 5

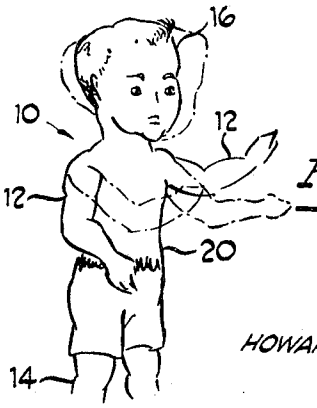


Fig 1

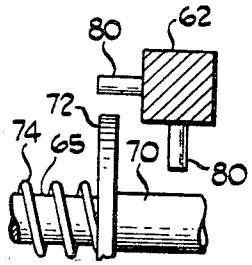


Fig 6

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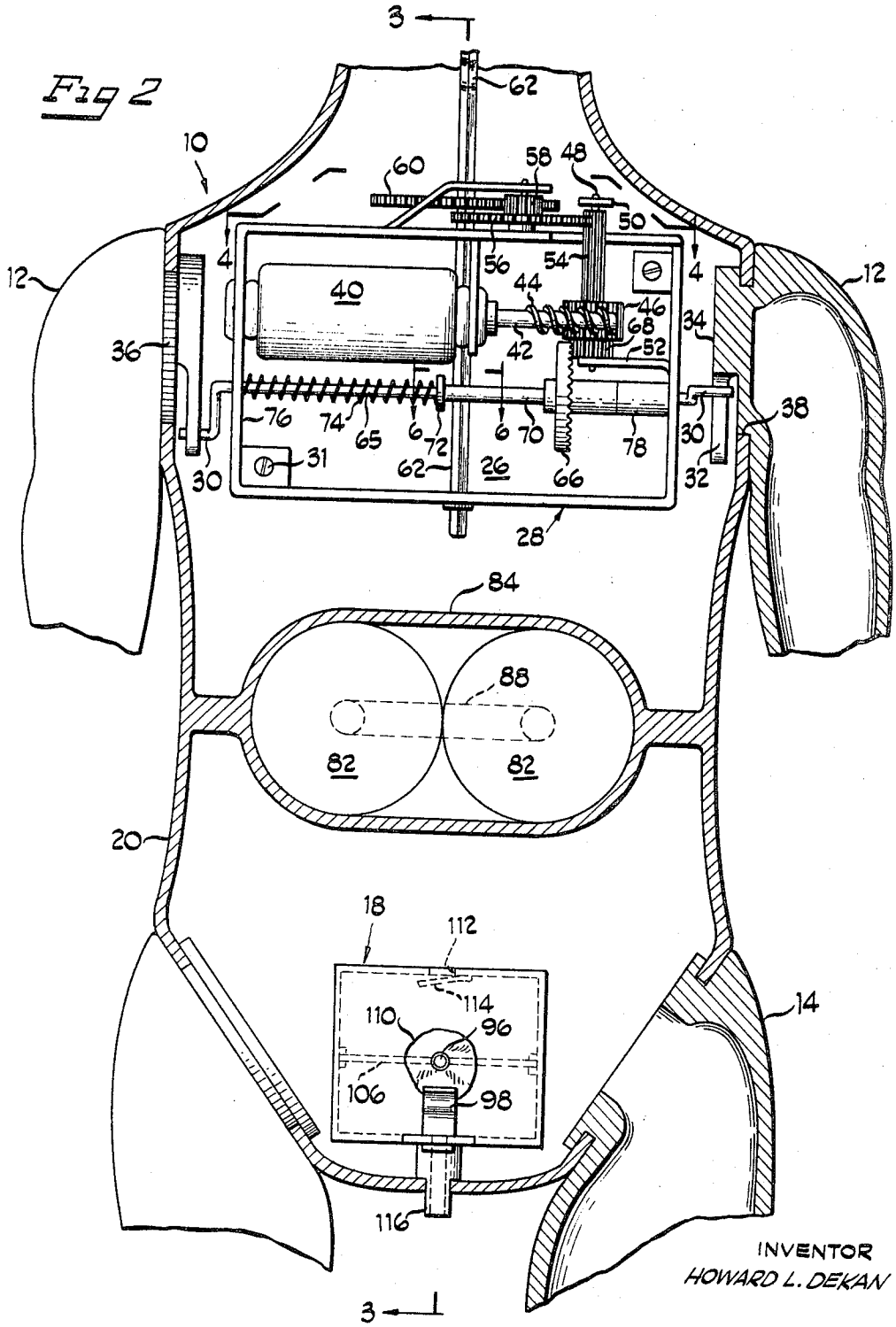
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SPLASHING DOLL

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Fig 2



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SPLASHING DOLL

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5 Claims

ABSTRACT OF THE DISCLOSURE

A motor operated mechanism for toys, dolls and the like, which includes a liquid responsive switch means, whereby the motor is operated, for example when a doll incorporating the mechanism is placed in a water-filled bath tub. Further, the operation of the motor effects a splashing movement of the doll's arms as well as a movement of the head, to thereby simulate the actions of a baby at play in the bath tub.

Background of the invention

Motor operated toys and dolls are, of course, well known, including dolls that walk and/or talk. In the prior devices, however, it is necessary to operate some external device in order to initiate operation of the motor. The present invention provides means for automatically actuating a motor mechanism, as the doll is placed in water, to effect a movement of the doll which is normally associated with a baby sitting in water, i.e., a splashing motion of the arms.

Summary of the invention

A motor operated toy comprising an electric motor, drive means connected to the motor and connected to a movable part on the toy, a battery powered circuit for the motor including a liquid-level operated switch which is disposed to close the circuit and operate the drive means when the toy is placed in a liquid. A specific object of the invention is to provide a doll having a relatively movable head and arms, and including a motor operated mechanism which is operable to effect a splashing motion of the arms when the doll body is placed in a liquid. Another object of the invention is to provide a motor operated doll mechanism in a doll body, including a float operated switch mechanism which is effective to energize the motor when the doll is placed in water and to shut off the motor when the doll is removed from the water.

Further objects and advantages will become apparent from the selected embodiment of the invention which is illustrated in the accompanying drawings.

Brief description of the drawings

FIGURE 1 is a perspective view of the doll;

FIGURE 2 is an enlarged fragmentary view of the doll with portions broken away and in section to illustrate the operating mechanism;

FIGURE 3 is a sectional view taken along the line 3—3 in FIGURE 2;

FIGURE 4 ir a view taken along the line 4—4 in FIGURE 2;

FIGURE 5 is an enlarged longitudinal sectional view of the doll head; and

FIGURE 6 is an enlarged fragmentary view of a portion of the mechanism taken generally along the line 6—6 in FIGURE 2.

With reference to the drawings, it will be seen that the selected embodiment of this invention comprises a doll **10** having movable arms **12**, movable legs **14** and a movable head **16**. Generally the doll includes battery powered mechanism which is connected with the arms and with the head to effect alternate vertical movement of the arms, as in a water splasing motion, and an accompanying nodding of the head, generally from side to side. The operation of such mechanism is controlled by means including a float valve controlled switch **18**, which is responsive to water or other liquid passing into and out of a sealed compartment within the body **20** of the doll. Thus, as the doll is placed in a bathtub, for example, and water enters into the compartment **22**, the switch **24** is closed to provide power to the mechanism **26** and effect up and down motion of the arms **14** and a movement of the head **16**. As the doll body is removed from the water, the switch **24** opens to stop the operation of the motor and the mechanism.

More particularly, the motor operated mechanism **26** comprises a supporting frame structure **28**, preferably of metal, which is suitably fastened to the upper portion of the doll body as by screws **30**. This generally rectangular frame has mounted thereon a transverse crank structure having crank arms **30** at opposite ends, each engaging a slot **32** in a bifurcated member **34** joined to each of the arms. The bifurcated member **34** is formed with a generally cylindrical serrated, journal portion **36** which fits within a serrated, circular opening **38** in the upper part of the body to thereby provide for swinging movement of the arm relative to the body. The rotation of the crank arm will, therefore, provide a raising and lowering motion for the arms **14**, with the operation of the arms being preferably out of phase so that one arm is raised as the other is lowered, and vice versa. Further, the serrated or knurled joint between the member **34** and the arm opening **38** provides sufficient friction to effect movement of the two in unison, while also permitting relative movement therebetween.

A conventional miniature electric motor **40** is mounted on the frame **28**, and the drive shaft **42** of the motor is provided with a worm **44** disposed in position for driving engagement with a spur gear **46** carried by a vertically extending shaft **48** journaled in a bracket **50** on the frame **28** and a bracket **52** attached to the side of the frame. The spur gear **46** is connected through speed reduction gears **54**, **56**, and **58** with a large ring gear **60** fixed to a vertically extending shaft **62** which is suitably journaled in the upper and lower plates of the frame structure **28**. This vertically extending shaft **62** has a bent portion **62***a* to provide a crank for effecting nodding operation of the head **16**. The upper end of shaft **62** is keyed to a boss **64** or the like in the upper part of the doll head, and as the shaft **62** rotates it causes the doll head **16**, which is flexibly mounted on the torso or body **20** of the doll, to move side to side in a nodding motion.

The transverse crank shaft **65** which provides for operation of the arms is rotatably driven through means of a gear **66** mounted on the shaft for rotation therewith and having its teeth in meshing engagement with a gear

68 which is fixed for rotation with the spur gear 46. Consequently, rotation of the spur gear 46 effects rotation of gear 66, transverse shaft 65 and the cranks 34 thereon. In order to effect intermittent movement of the arms, the gear 66 is slidably mounted on the shaft 65 for movement with a sleeve portion 70 having an enlarged flange 72 on one end and biased by a coil spring 74 interposed between such flange and the opposite side wall 76 of the supporting frame 28. A cylindrical bearing element 78 on the other end of the shaft 65 provides a spacer for determining the operative position for the gear 66. The sleeve 70 and gear 66 thereon are moved axially along the shaft 65 by means of a pair of camming pins 80 fixed to the vertical shaft 62. As shaft 62 rotates and one of the pins 80 engages the flange 72, it moves the sleeve 70 and gear 66 to the left, as seen in FIGURE 2, and thereby pulls the gear 66 out of engagement with the driving gear 68. Continued rotation of the rectangular shaft 62 frees the flange 72 from the camming action of the pin 80, and the coil spring 74 moves the sleeve to the right and thereby presses the gear 66 in engagement with its driving gear 68. Consequently, in the illustrated embodiment (FIGURE 6) there are two interruptions to the arm movement for each revolution of the vertical shaft 62.

The motor 40 is energized by a pair of flashlight batteries 82 contained in a housing 84 within the doll body and having a removable cover 86 at the back of the doll for replacement of the batteries. A contact strip 88 on the inner surface of the cover and a contact plate 90 at the opposite end of the housing complete the circuit for the batteries, and the contact plate 90 (FIGURE 3) is connected by a first wire 92 with the motor and by a second wire 94 to the terminal 96 of the switch mechanism 24, with the other terminal 98 of the switch being connected to the motor by a third wire 100. The movable switch terminal 96 comprises the outer end of a metalic rod 102 or the like, which extends within the float housing 22 and has a hollow plastic body 104 or the like comprising a float fixed to its inner end. The rod 102 is supported by a transverse shaft 106 journaled in the housing. The opening 108 for the movable contact is sealed to prevent escapement of liquid from the housing, as by means of a shroud 110 of rubber or other flexible material. The stationary contact 98 is fixed to the outer portion of the housing 22 in position for engagement by the movable contact 96. The upper end of the housing 22 includes an air intake opening 112, and a flap valve 114 of flexible material, such as rubber, is disposed within the housing in position to prevent escapement of liquid through this opening. The lower end of the housing is provided with a tube 116 which extends downwardly through the doll body to the atmosphere.

As the doll body is placed in water or the like, preferably in a sitting position, water enters the housing 22 through the tube 116 and causes the float 104 to move upwardly. This in turn moves the contact 96 into engagement with the stationary contact 98 and thereby closes the electric circuit to the motor 40. The operation of the motor turns worm 44 and the gear mechanism driven thereby to rotate shaft 65 and vertical shaft 62 to cause the vertical oscillating motion of the arms 14 in the manner previously described, and to cause a side to side nodding motion of the head 16. With the doll in a sitting position, the resulting effect is a splashing of the water by the doll's arms 14 and the accompanying head movement. As the doll body 20 is withdrawn from the liquid into the atmosphere, the water previously taken into the housing 22 is drained out through the tube 116 and the float 104 moves downwardly to thereby open the contacts 96, 98 and de-energize the motor 40.

Although shown and described with respect to specific mechanism and a specific embodiment, it will be apparent that the invention described herein is applicable to other mechanisms and embodiments. It is contemplated that other forms of toys which are usable in conjunction with water may be adapted to employ the principles of the invention described herein.

What is claimed is:

1. A motor operated toy comprising an electric motor, drive means connected to said motor for operation thereby, a part carried on said toy for relative movement and being connected with said drive means, a battery carried by said toy, and means providing an electrical connection between said battery and said motor and including a liquid-level operated switch which is disposed to effect a closing of the electrical circuit and operation of said drive means when liquid is introduced into said toy to actuate said switch.

2. A motor operated toy as set forth in claim 1, including a housing portion for the toy, and wherein said motor and drive means are enclosed within said housing, said housing including means providing fluid communication between the liquid operated switch and the exterior of said housing, so that the placement of said housing in a liquid is effective to close said switch.

3. A motor operated toy as set forth in claim 1, wherein said toy is a doll, said relatively movable part is an arm on said doll, and including means in the lower part of the doll body placing said liquid-level operated switch in communication with the exterior of the doll and providing for the passage of liquid therethrough, so that when the doll is placed in a liquid the latter enters the body and closes the switch, thereby actuating the drive means to cause relative movement of the arm.

4. A doll comprising a body portion having a pair of arms mounted thereon for relative movement, a drive mechanism within said body including an electric motor having a drive shaft, a drive gear on said shaft, a driven shaft connected with said drive gear and with each of said movable arms through means operable to effect intermittent raising and lowering of the arms upon rotation of said driven shaft an electrical circuit within said body for controlling the operation of said motor and including switch means which is operative to close said circuit when said body is placed in a liquid and to open said circuit when said body is withdrawn from the liquid, said switch means including a liquid tight housing within said doll body, a liquid inlet opening in the lower portion of said housing, a conduit placing said inlet in fluid communication with the exterior of said body, a float means pivotally supported within said housing for movement between an upper and lower portion of said housing, said float means including an electrical contact extending outwardly of said housing and movable with said float, and a second electrical contact outside of said housing in position for engagement by said movable contact.

5. A doll comprising a body portion having a pair of arms and a head mounted thereon for relative movement, a drive mechanism within said body including an electric motor having a drive shaft, a drive gear on said shaft, a first driven shaft having means thereon connected with said head to effect movement of the head as said shaft is rotated, a second driven shaft connected with each of said movable arms through means including a crank and means fixed to the upper end of the arm for rotation therewith and which includes a slotted portion engaged by said crank, gear means connecting said drive gear with said first and second driven shafts, an electrical circuit within said body for controlling the operation of said motor and including switch means which is operative to close said circuit when said body is placed in a liquid and to open said circuit when said body is withdrawn from the liquid, said switch means including a liquid tight housing within said doll body, an air intake opening in the upper part of said housing, a flap valve within said housing in covering relation to said air intake and operable to prevent the flow of liquid therethrough, a liquid inlet opening in the lower portion of said housing, a conduit

placing said inlet in fluid communication with the exterior of said body, a float means pivotally supported within said housing for movement between an upper and lower portion of said housing, said float means including an electrical contact extending outwardly of said housing and movable with said float, a second electrical contact outside of said housing in position for engagement by said movable contact, and flexible sealing means secured between said movable contact and said housing to permit movement of said contact while preventing the escape of liquid from the housing.

References Cited

UNITED STATES PATENTS

3,190,038	6/1965	Kardon	46—232
3,229,421	1/1966	Ostrander	46—247
3,269,056	8/1966	Hockman et al.	46—247

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U.S. Cl. X.R.

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