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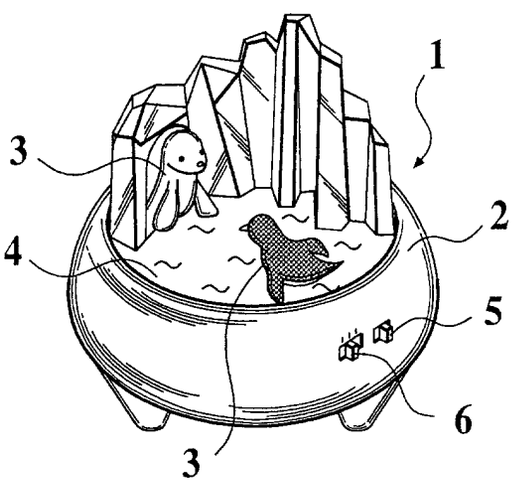
(54) **FLOATING TOY**

(57) A moving toy includes: a plurality of control coils; a control device to control conduction to the plurality of control coils; and a moving body provided with a magnet, the moving body being operated through the control of the conduction.

FIG.1A



EP 1 574 242 A1

Description

Technical Field

[0001] The present invention relates to a moving toy, and, more particularly, to a moving toy operated by magnetic force.

Background Art

[0002] There has been known a moving toy utilizing magnetic force in which a magnet is attached to each top of two operation plates extending under a field board, dolls (moving toys) each provided with a magnet are disposed on the field board, and the dolls are caused to play sumo-wrestling on the field board trough operation of the operation plates (for example, see JP-Jitsukaisho-52-140886-U) .

[0003] However, it is cumbersome to operate the magnets under the field board in order to operate the dolls on the field board. Moreover, since the magnets under the field board are operated manually by the player(s) and the dolls on the field board are only operated in accordance with the movement of the magnets, such moving toy is not really interesting.

[0004] The present invention has been made in view of the above problem, and a main object thereof is to provide a highly interesting moving toy.

Disclosure of the Invention

[0005] According to a first aspect of the present invention, a moving toy comprises: a plurality of control coils; a control device to control conduction to the plurality of control coils; and a moving body provided with a magnet, the moving body being operated through the control of the conduction.

[0006] According to the moving toy, the control of the conduction to the plurality of control coils is performed by the control device, and the moving body provided with the magnet is operated. Therefore, it is not necessary to manually operate the magnet or the like in order to operate the moving body.

[0007] According to a second aspect of the present invention, a moving toy comprises: a field board; a plurality of control coils provided beneath the field board; a control device to control conduction to the plurality of control coils; and a moving body provided with a magnet, the moving body being operated through the control of the conduction.

[0008] According to the moving toy, the control of the conduction to the plurality of control coils is performed by the control device, and the moving body provided with the magnet is operated on the field board. Therefore, it is not necessary to manually operate the magnet or the like under the field board in order to operate the moving body.

[0009] Preferably, the moving body is a figure of any one of a living body, a vehicle, a production, and a visual scene. Here, the living body, vehicle, production and visual scene also includes an imaginary one, not to speak of an existing one.

[0010] According to the moving toy, it is possible to operate the figure through the control of the conduction to the plurality of control coils performed by the control device.

[0011] Preferably, the moving toy further comprises a coil and a light-emitting diode which are provided to the moving body, wherein induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode.

[0012] According to the moving toy, it is possible to turn on the light-emitting diode mounted in the moving body through the control of the conduction to the plurality of control coils performed by the control device.

[0013] Preferably, the moving toy further comprises a coil provided to the moving body, wherein induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

[0014] According to the moving toy, it is possible to operate the part of the moving body through the control of the conduction to the plurality of control coils performed by the control device.

[0015] Preferably, the moving toy further comprises a coil and a light-emitting diode which are provided to the moving body, wherein induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode, while induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

[0016] According to the moving toy, it is possible to turn on the light-emitting diode mounted in the moving body and to operate the part of the moving body through the control of the conduction to the plurality of control coils performed by the control device.

[0017] Preferably, a plurality of moving bodies are included.

[0018] According to the moving toy, it is possible to operate a number of moving toys through the control of the conduction to the plurality of control coils performed by the control device.

[0019] Preferably, a coil and a light-emitting diode is provided to at least one of the moving bodies, and induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode.

[0020] According to the moving toy, it is possible to

turn on the light-emitting diode mounted in the moving body through the control of the conduction to the plurality of control coils performed by the control device.

[0021] Preferably, a coil is provided to at least one of the moving bodies, induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

[0022] According to the moving toy, it is possible to operate the part of the moving body through the control of the conduction to the plurality of control coils performed by the control device.

[0023] Preferably, a coil and a light-emitting diode is provided to at least one of the moving bodies, induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode, while induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

[0024] According to the moving toy, it is possible to turn on the light-emitting diode mounted in the moving body and to operate the part of the moving body through the control of the conduction to the plurality of control coils performed by the control device.

Brief Description of the Drawings

[0025]

FIGS. 1A, 1B and 1C are perspective views of a moving toy according to an embodiment of the present invention.

FIG. 2 is a plan view showing positions of control coils of the moving toy according to the embodiment of the present invention.

FIG. 3 is a block diagram showing a circuit of the moving toy according to the embodiment of the present invention.

FIG. 4 is a view showing attached states of a magnet and a light-emitting diode in a moving body of the moving toy according to the embodiment of the present invention.

FIG. 5 is a view showing another example of the moving toy according to the embodiment of the present invention.

Best Mode for Carrying Out the Invention

I. First Embodiment

1. Entire Structure and Operation

[0026] A moving toy 1 includes a base member 2 and moving bodies 3 as shown in FIGS. 1A, 1B and 1C. A field board 4 which forms a space for moving is provided to the base member 2. The moving bodies 3 are disposed on the field board 4. Further, a power supply switch 5 and a mode selector switch 6 are provided to the base member 2.

[0027] In the moving toy 1, when the power supply switch 5 is turned ON and mode selection is performed through the mode selector switch 6, the moving body (bodies) 3 moves in accordance with a pattern corresponding to the selected mode. For example, the moving body (bodies) 3 moves around on the field board 4 in accordance with a predetermined pattern.

[0028] The moving toy will be detailed hereinbelow.

2. Detail

(1) Base Member 2

[0029] As shown in FIG. 2, a plurality of control coils 7 are provided beneath the field board 4. The control coils 7 are disposed such that the magnetic flux thereof goes beyond the field board 4. In FIG. 3, there is shown a block diagram of a drive circuit to drive the control coils 7. A control device 21 is mounted into a drive circuit 20. The control device 21 controls the control coils 7 in accordance with control programs stored in a storage device 22. Although not particularly limited, the control includes control of on/off of conduction, control of the order of the conduction, control of the direction of the current flowing through the control coils 7, and control of the intensity of the current.

(2) Moving Body 3

[0030] As shown in FIG. 4, a ring-shaped magnet 10 is disposed in each of the moving bodies 3. Moreover, in each of the moving bodies 3, provided are a coil 11 placed in a center of the ring-shaped magnet 10, and light-emitting diodes 12 connected to the coil 11 in series. The light-emitting diodes 12 are, for example, mounted in each of the mobbing bodies 3 at the positions of the eyes thereof.

3. Operation and Movement

[0031] When the power supply switch 5 is turned ON and a mode is selected through the mode selector switch 6, a control program corresponding to the selected mode is read from the storage device 22 by the control device 21, and the control coils 7 are subjected to conduction control in order in accordance with the control program. More specifically, the conduction control is performed such that the moving body (bodies) 3 receives attraction force from the control coil(s) 7 disposed in the direction in which the moving body (bodies) 3 is moving, while the moving body (bodies) 3 receives repulsion force from the control coil(s) 7 disposed directly under the moving body (bodies) 3. The moving body

(bodies) 3 thus moves toward the direction of the attraction force. Moreover, since induced electromotive force is generated at this time at the coil(s) 11, the light-emitting diodes 12 are turned on.

[0032] Here, it goes without saying that it is possible to stop the moving bodies 3 by cutting the conduction to the control coils 7. However, it is also possible to change, after the moving body (bodies) 3 is stopped, the intensity or direction of the current flowing through the control coils 7 and turn on the light-emitting diodes 12, with the moving body (bodies) 3 kept stopped.

4. Advantageous Effect

[0033] Since the moving bodies 3 are operated through control of the conduction to the control coils 7, it is possible to allow the moving bodies 3 to make complicated and unpredictable movement.

II. Modification of the Invention

[0034] Hereinabove, an embodiment of the present invention has been described. The present invention, however, is not limited to the above embodiment. It goes without saying that various modifications can be made without departing from spirit and scope of the invention.

[0035] For example, a figure of a car or a train may be used as the moving body 3. In this case, for example, a magnet may be provided to the vehicle body, and the wheels may be rotated by permitting attraction force or repulsive force to act on the vehicle body through control of the conduction to the control coils 7. Moreover, in this case, it is preferable to provide on the field board 2 a road, a production related to cars (for example, garage), a gas station, and the like. Further, light-emitting diodes may be mounted in the positions of the front lights of the car toy.

[0036] Moreover, a figure of a teeter-totter (production) may be used as the moving body 3. In this case, a magnet is mounted under at least one of the seats, and the teeter-totter is reciprocally moved by permitting attraction force or repulsive force to act on the magnet.

[0037] Further, as shown in FIG. 5, by attaching the coil 11 to the moving body 3, generating induced electromotive force to the coil 11 through control of the conduction to the control coils 7 performed by the control device 21, and generating new magnetic flux at the coil 11, part of the moving body 3, for example, ears 30, may be operated around an axis 31 through a magnet 32 due to the generated magnetic flux.

Industrial Applicability

[0038] To describe advantageous effect of the representative embodiment of the present invention, a moving toy comprises: a plurality of control coils; a control device to control conduction to the plurality of control coils; and a moving body provided with a magnet, the moving body being operated through the control of the conduction; therefore, it is possible to allow the moving body to make complicated and unpredictable movement, thus realizing a highly interesting moving toy.

Claims

1. A moving toy comprising: a plurality of control coils; a control device to control conduction to the plurality of control coils; and a moving body provided with a magnet, the moving body being operated through the control of the conduction.

2. A moving toy comprising: a field board; a plurality of control coils provided beneath the field board; a control device to control conduction to the plurality of control coils; and a moving body provided with a magnet, the moving body being operated through the control of the conduction.

3. The moving toy as claimed in claim 1 or 2, wherein the moving body is a figure of any one of a living body, a vehicle, a production, and a visual scene.

4. The moving toy as claimed in any one of claims 1 to 3, further comprising a coil and a light-emitting diode which are provided to the moving body, wherein induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode.

5. The moving toy as claimed in any one of claims 1 to 3, further comprising a coil provided to the moving body, wherein induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

6. The moving toy as claimed in any one of claims 1 to 3, further comprising a coil and a light-emitting diode which are provided to the moving body, wherein induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode, while induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

7. The moving toy as claimed in any one of claims 1 to 3, wherein a plurality of moving bodies are included.

8. The moving toy as claimed in claim 7, wherein a coil and a light-emitting diode is provided to at least one of the moving bodies, and induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode.

9. The moving toy as claimed in claim 7, wherein a coil is provided to at least one of the moving bodies, induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

10. The moving toy as claimed in claim 7, wherein a coil and a light-emitting diode is provided to at least one of the moving bodies, induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, to turn on the light-emitting diode, while induced electromotive force is generated at the coil through the control of the conduction to the control coils performed by the control device, and new magnetic flux is generated at the coil, to operate part of the moving body through the magnetic flux.

FIG.1A

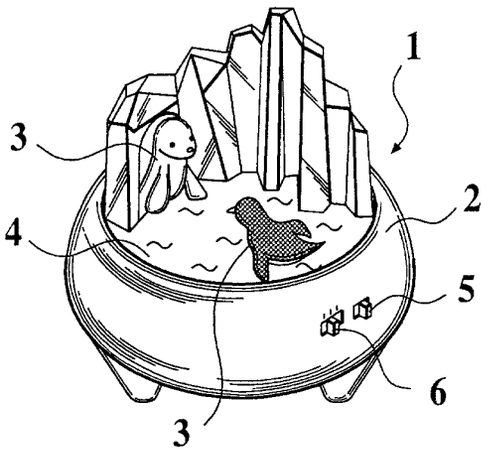


FIG.1B

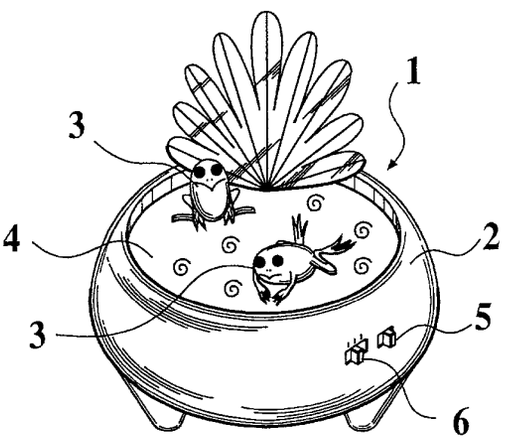


FIG.1C

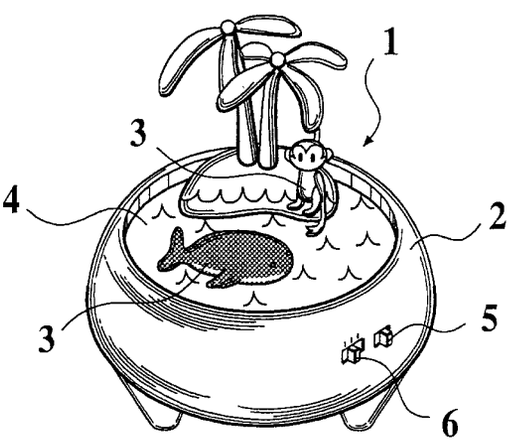


FIG.2

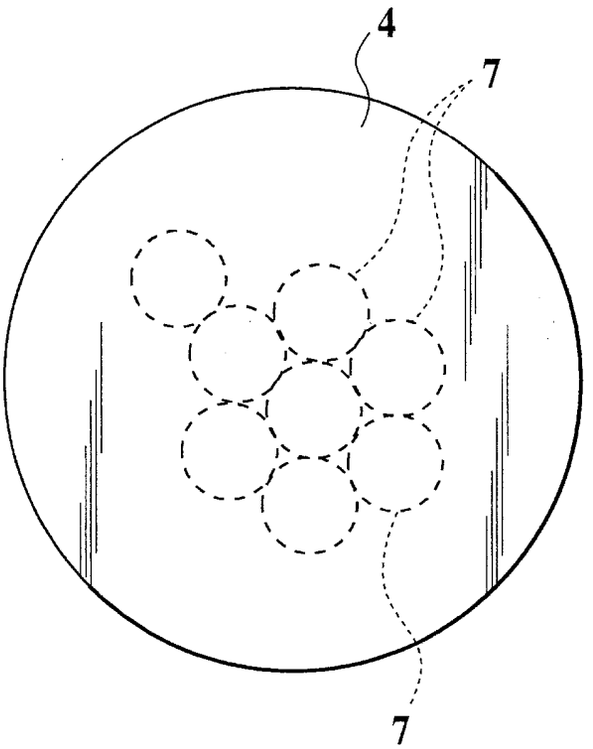


FIG.3

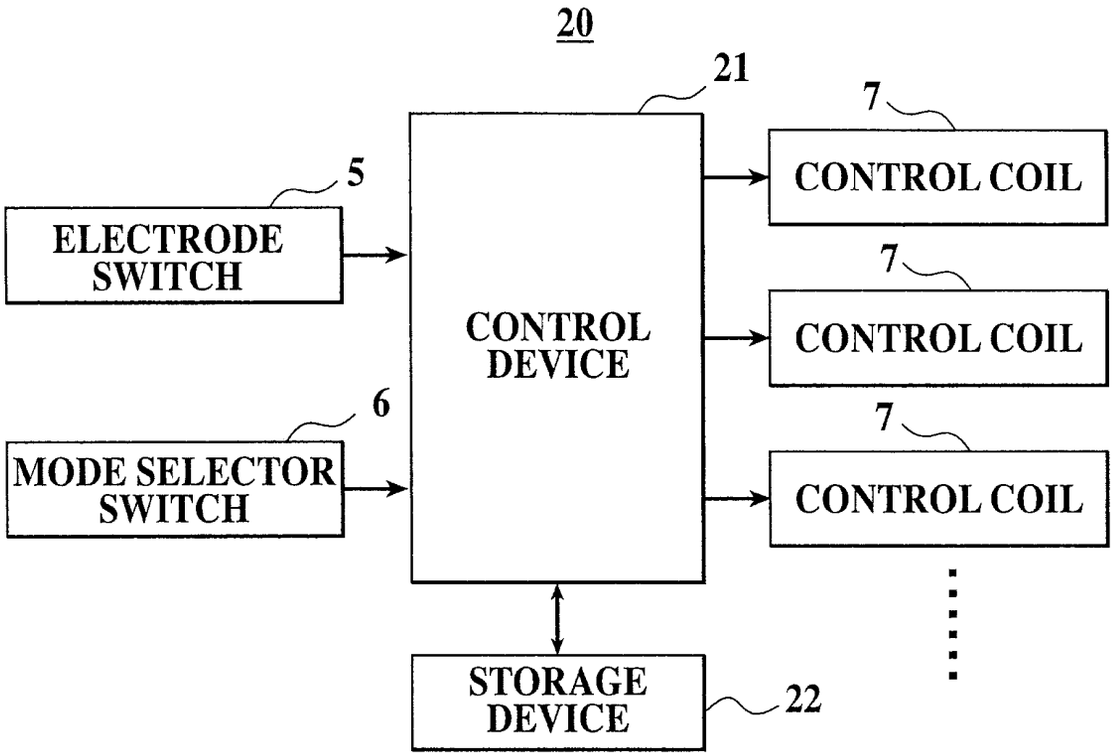

20
21
7
5
ELECTRODE SWITCH
CONTROL DEVICE
CONTROL COIL
7
CONTROL COIL
6
MODE SELECTOR SWITCH
7
CONTROL COIL
STORAGE DEVICE
22

FIG.4

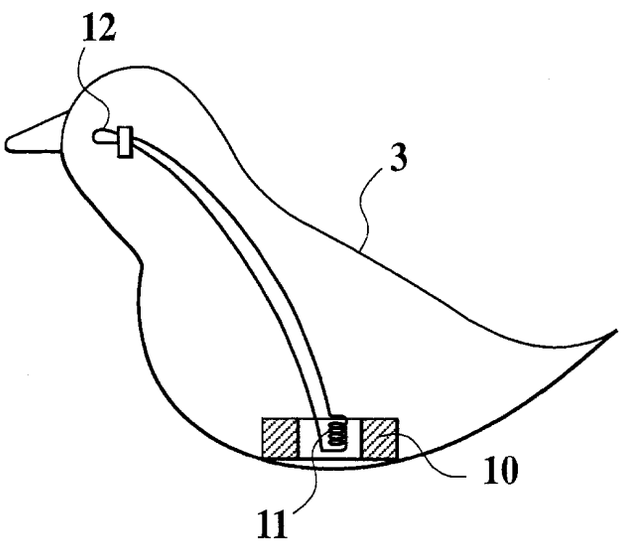
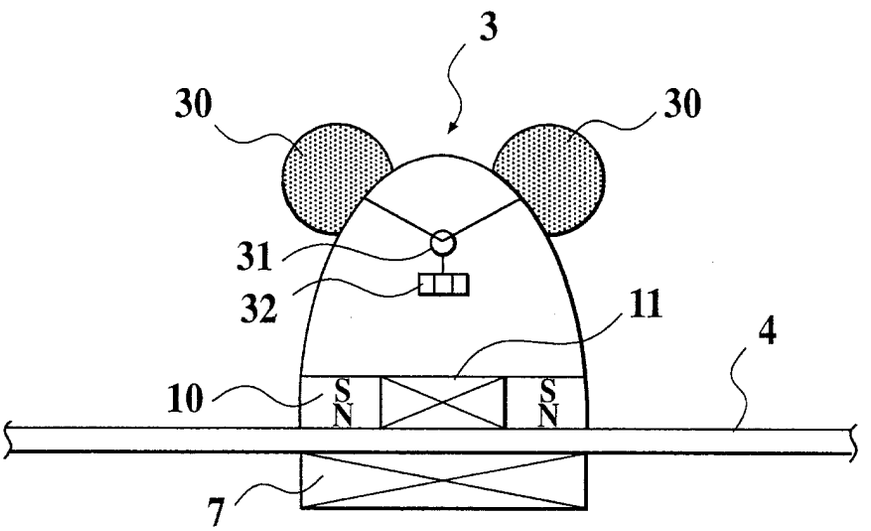

12
3
10
11

FIG.5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP03/16112

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[7] A63H29/22, A63H33/26, A63F9/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[7] A63H1/00-37/00, A63F9/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2004
Kokai Jitsuyo Shinan Koho	1971-2004	Jitsuyo Shinan Toroku Koho	1996-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 196611/1986(Laid-open No. 100099/1988) (Yugen Kaisha NIA), 29 June, 1988 (29.06.88), Full text; Figs. 1 to 4 (Family: none)	1-3,5,7,9 4,6,8,10
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 94535/1975(Laid-open No. 9591/1977) (Satoshi ASADA), 22 January, 1977 (22.01.77), Full text; Fig. 1 (Family: none)	4,6,8,10

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 January, 2004 (16.01.04)	03 February, 2004 (03.02.04)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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