(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 684 883 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
08.05.2013 Bulletin 2013/19

(21) Application number: **04811943.2**

(22) Date of filing: **22.11.2004**

(51) Int Cl.:
A63H 33/04 *(2006.01)*

(86) International application number:
PCT/US2004/039313

(87) International publication number:
WO 2005/051506 (09.06.2005 Gazette 2005/23)

(54) **LIQUID ACTIVATED TOYS AND OPERATING SYSTEM FOR USE WITH SAME**

FLÜSSIGKEITSAKTIVIERTE SPIELZEUGE UND BETRIEBSSYSTEM ZUM EINSATZ DAMIT

JOUETS À ACTIVATION LIQUIDE ET SYSTÈME D'EXPLOITATION UTILISÉ AVEC CES JOUETS

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LU MC NL PL PT RO SE SI SK TR

(30) Priority: **21.11.2003 US 524319 P**
17.12.2003 US 530549 P
19.11.2004 US 993794

(43) Date of publication of application:
02.08.2006 Bulletin 2006/31

(73) Proprietor: **MATTEL, INC.**
El Segundo, CA 90245 (US)

(72) Inventors:
- **TRAGESER, Mark**
  Los Angeles, CA 90035 (US)
- **POHLMAN, Kip**
  Los Angeles, CA 90045 (US)
- **STONER, DON, Wayne**
  Lakewood, CA 90713 (US)
- **GINKEL, Ernst, E.**
  La Verne, CA 91750 (US)
- **MARTIN, Raymond, J.**
  Sherman Oaks, CA 91423 (US)

(74) Representative: **Müller, Gerald Christian et al**
Hansmann & Vogeser
Patent- und Rechtsanwälte
Albert-Rosshaupter-Strasse 65
81369 München (DE)

(56) References cited:
WO-A-01/74463
JP-A- 2000 089 654
JP-A- 2000 262 766
US-A- 4 347 683
US-A- 4 547 169

EP 1 684 883 B1

Description

Technical Field

[0001] The present disclosure relates generally to toys in which the performance of the toy is a function of a predetermined quantitative characteristic of a chosen liquid, and more particularly to toy vehicles configured to exhibit one or more toy output patterns based on the electrical conductivity of a chosen liquid.

Summary

[0002] The present disclosure relates generally to toys in which the performance of the toy is a function of a given characteristic of a chosen liquid. An operating system for such a toy may include an input system responsive to a predetermined quantitative characteristic of a liquid, and a response system coupled to the input system and configured to generate one or more toy output patterns based at least in part on the given characteristic. In some embodiments, the toy is a battery-powered toy vehicle with a chamber for containing a liquid body, a pair of electrical contacts to measure the electrical conductivity of the liquid body, a processor or logic unit to communicate data representative of the measured conductivity, and a response system to operate one or more vehicle features or components of the toy based on the conductivity data communicated according to a predetermined output pattern. In some embodiments, the chamber is detachable from the toy vehicle. Exemplary components may include a drive assembly to provide a motive force for the toy vehicle, such as to move the toy vehicle across a ground surface, and/or an audiovisual assembly including lights and speakers, such as to produce an audiovisual display. Output patterns may include combinations of lights, sounds, and/or toy vehicle movement speed.

[0003] In play patterns for use with such a toy vehicle, a user may fill the chamber with a chosen mixture of one or more household liquids (such as water, juice, or a carbonated beverage) according to the user's preference. The contacts then measure the electrical conductivity of the chosen liquid mixture, and the processor prompts the response system to produce an output pattern that may simulate whether or not the chosen mixture is an appropriate "fuel" for the vehicle. Thus, a user may try several different liquid mixtures in order to discover an optimum "fuel" mixture that produces a user-preferred output pattern.

[0004] Examples of fluid activated devices are found in U.S. Patent Nos. 4,347,683 and 4,547,169, Japanese Patent Application No. 2000-089654, and publication WO0174463.

[0005] The present invention provides a toy vehicle according to claim 1 and a method of operating a toy vehicle according to claim 10.

Brief Description of the Drawings

[0006] Fig. 1 is a block diagram of a toy operating system suitable for use with a toy of the present disclosure.

[0007] Fig. 2 is a block diagram of an exemplary embodiment of a toy vehicle operating system.

[0008] Fig. 3 is a top plan view of an exemplary embodiment of a toy vehicle for use with the toy vehicle operating system of Fig. 2.

[0009] Fig. 4 and 5 are side elevation views of an exemplary embodiment of a detachable liquid receiving chamber suitable for use with the toy vehicle of Fig. 3.

[0010] Fig. 6 is a top plan view of the toy vehicle of Fig. 3, showing the liquid receiving chamber of Figs. 4 and 5 coupled to the toy vehicle.

[0011] Fig. 7 is a side elevation view of the toy vehicle of Fig. 3, also showing the liquid receiving chamber of Figs. 4 and 5 coupled to the toy vehicle.

[0012] Fig. 8 is a schematic representation of the toy vehicle of Fig. 3 with the toy vehicle operating system of Fig. 2, showing how various components of the toy vehicle operating system are coupled with various components of the toy vehicle.

Detailed Description

[0013] Fig. 1 shows a schematic representation of a toy operating system 10. The operating system includes an input system 12 and a response system 14. Input system 12 is coupled with a liquid body 16, and is configured to be responsive to a predetermined quantitative characteristic or chemical property of the liquid body, such as electrical conductivity. A liquid body may be any volume of liquid, such as a mixture of one or more liquids contained in a reservoir or other receptacle, a mixture of solid and liquid matter, and so forth. Input system 12 is thus configured to measure or otherwise nonconsumptively determine the characteristic and also to communicate data or other information representative of the measured characteristic to response system 14. Response system 14 is configured to generate one or more predeter-

mined toy output patterns, based at least in part on the communicated data or information.

[0014] A non-limiting exemplary embodiment of toy operating system 10 is shown in Fig. 2 as a toy vehicle operating system 110. Toy vehicle operating system 110 includes an input system 112 and a response system 114, and is coupled with a liquid body 116 contained in a reservoir 118. Reservoir 118 may be any receptacle adapted to contain a liquid body 116, such as a liquid receiving chamber that may be detachably coupled with toy vehicle operating system 110.

[0015] As with the components of toy operating system 10 as explained above, input system 112 is configured to measure a given characteristic of liquid body 116, and response system 114 is configured to generate one or more predetermined toy output patterns based at least in part on the measurement.

[0016] As explained in more detail below, in some embodiments of toy vehicle operating system 110, input system 112 may be configured to measure the electrical conductivity of a liquid body in reservoir 118, and response system 114 may be configured to generate a toy output pattern based on the measured electrical conductivity. Thus, response system 114 may be configured to generate different toy output patterns when liquids or liquid mixtures having different conductive properties are placed in reservoir 118. For example, a first predetermined toy output pattern may correspond to a liquid mixture having an electrical conductivity in a first range, and a second predetermined toy output pattern may correspond to another liquid mixture having an electrical conductivity in a second range.

[0017] Input system 112 further includes a measuring assembly 120 to measure the selected, or predetermined, characteristic. Toy vehicle operating system 110 is configured to be responsive to the electrical conductivity of liquid body 116. Thus, measuring assembly 120 includes a pair of electrical contacts 122 configured to deliver an electrical current through liquid body 116 and thus determine the liquid's electrical conductivity. However, although measuring assembly 120 is shown to include electrical contacts 122, the nature of the characteristic to be measured may determine the structural characteristics and/or components of the measuring assembly. As such, a toy operating system configured to be responsive to other liquid properties may include devices, instruments, or other structural components appropriate for nonconsumptive measurement of one or more of such quantitative properties of a liquid body.

[0018] Input system 112 also includes a processor assembly 130 coupled to measuring assembly 120. Processor assembly 130 is configured to produce information representative of the measurement of the liquid characteristic. More particularly, in the exemplary toy vehicle operating system, processor assembly 130 is configured to produce operational instructions, or inputs, for one or more components of response system 114 based on the measured electrical conductivity of a liquid body 116.

[0019] Different liquids may have different electrical conductivities within a measurable spectrum extending from completely nonconductive (i.e. the liquid does not conduct electricity) to completely conductive (i.e. current flows through the liquid with no resistance). In the exemplary toy vehicle operating system, processor assembly 130 is configured to produce a predetermined set of operational instructions, prompting a corresponding toy output pattern, based on the liquid's conductivity as measured by measuring assembly 120. For example, if a liquid's electrical conductivity is within a first conductivity range within the spectrum, a first set of predetermined operational instructions may be produced, which prompt a first corresponding output pattern, but if a liquid's electrical conductivity is within a second conductivity range, a second predetermined set of operational instructions may be produced, which prompt a second corresponding output pattern. However, a toy vehicle operating system may be configured to produce any desired number of sets of operational instructions and/or output patterns to correspond with any desired number of ranges.

[0020] Processor assembly 130 thus may include any computational device, such as a microprocessor, a logic unit, or any other circuitry adapted to produce information representative of the measured characteristic and to communicate this information to the response system. As described above, such information includes operational instructions for one or more components of response system 114, but may optionally include any data, whether processed, partially processed or unprocessed, or sub-sets of the data, relating to the measured characteristic, which may be communicated to response system 114.

[0021] Response system 114 may include components such as an audiovisual assembly 140 to produce a plurality of predetermined audiovisual displays, a drive assembly 150 to provide a motive force for a toy vehicle, such as to move the toy vehicle across a ground surface at a plurality of predetermined rates of speed, and/or additional components, in any desired combination. In the illustrated embodiment, response system 114 is configured to generate a toy output pattern by activating one or more of such components based on the operational instructions and/or other information received from processor assembly 130. The configuration of the various components of a response system, and the nature of the toy output patterns generated, may vary depending on the nature of the toy vehicle used with the toy vehicle operating system.

[0022] For example, if toy vehicle operating system 110 is used with a battery-powered toy vehicle such as a toy racecar, audiovisual assembly 140 may further include a light system 142 and/or a speaker system 144. Light system 142 may include one or more lights disposed on the toy vehicle chassis, such as headlights, tail lights, and so forth, and speaker system 144 may include one or more speakers configured to emit sounds consistent with a racecar design, such as a tire squealing or an engine "revving" at various speeds. Activation of audiovisual assembly 140 may thus include producing lights and/or sounds simulating those produced by a racecar. Analogously, drive assembly 150 may

further include a motor assembly 152 coupled to a driven wheel assembly 154. Motor assembly 152 may include one or more motors, and driven wheel assembly may include one or more driven wheels adapted to move the toy vehicle across a ground surface. Thus, activation of drive assembly 150 may include prompting motor assembly 152 to provide motive power to a driven wheel of driven wheel assembly 154. Toy output patterns for the toy vehicle may thus include various combinations of lights, sounds, and/or toy vehicle movement speed.

[0023] Power for the various component systems of toy vehicle operating system 110 may be supplied by one or more batteries and/or other power sources. Continuing the example above, a toy vehicle for use with toy vehicle operating system 110 may thus include a battery compartment or other structural features to accommodate an onboard power source. Optionally, any suitable form of power source may be used. Further, a power switch may be provided to allow the power source to supply power to the various component systems as required by toy vehicle operating system 110, or to disengage the power supply if the toy vehicle is not in use.

[0024] Figs. 3-8 show an exemplary toy vehicle 210 and a liquid receiving chamber 212 that may be used with toy vehicle operating system 110. More particularly, Fig. 3 shows a top view of toy vehicle 210, which includes a chassis 220 shaped to resemble a racecar. Toy vehicle 210 also includes a plurality of wheels 222 mounted on the chassis, which further include a driven wheel 224 and rolling wheels 226. Chassis 220 also includes a plurality of lights 228, a speaker 230, an actuator 232 in the form of a push button, and a power switch 234.

[0025] Driven wheel 224, lights 228, speaker 230, and actuator 232 are coupled to various component systems or assemblies of toy vehicle operating system 110. More particularly, driven wheel 224 is coupled with drive assembly 150, and lights 228 and speaker 230 are coupled with audiovisual assembly 140. Actuator 232 is coupled to input system 112. Power switch 234 is coupled to a battery assembly or other power source (not shown), and is configured to engage the power source with, or disengage the power source from, the toy vehicle operating system.

[0026] Chassis 220 further includes a recessed channel 236. Retention devices 238 are disposed on either side of recessed channel 236, and visible within recessed channel 236 are electrical contacts 122 of toy vehicle operating system 110.

[0027] Liquid receiving chamber 212, shown in Figs. 4 and 5, is configured to contain a liquid body and be detachably coupled to chassis 220 within recessed channel 236. As such, chamber 212 includes substantially cylindrical chamber wall 240 adapted to conform in size and shape with the contour of channel 236 One end of chamber 212 includes an input port 242 for delivery of a liquid into, or from, the chamber. A closure member 244, shown as a screw cap, is adapted to prevent liquid from escaping from chamber 212 through input port 242. A pair of electrodes 246 are disposed on the other end of chamber 212, which protrude through chamber wall 240 and into a liquid body contained in chamber 212. The view shown in Fig. 4 depicts the "bottom" of chamber 212, and the view shown in Fig. 5 depicts one "side" of chamber 212.

[0028] As shown in Fig. 6, when chamber 212 is placed within recessed channel 236 with the "bottom" of the chamber positioned against the surface of channel 236, retention devices 238 are adapted to retain chamber 212 in place until detached from the chassis, and electrical contacts 122 are positioned to press against electrodes 246. Fig. 7 shows a side view of toy vehicle 210 with chamber 212 coupled to chassis 220.

[0029] Fig. 8 shows a schematic representation of toy vehicle operational system 110 as used with toy vehicle 210. When chamber 212 is coupled to chassis 220 as described above, electrical contacts 122 of measuring assembly 120 are positioned against electrodes 246. When actuator 232 (not shown in this view) is depressed, measuring assembly 120 of input system 112 generates an electrical current and measures the current flow between electrodes 246, if any. Processor assembly 130 produces operational instructions and/or other information representative of the measured conductivity and communicates the instructions to response system 114, prompting the components of response system 114 to generate a toy output pattern consisting of a predetermined combination of activation of lights 228 and/or speaker 230, to produce an audiovisual display, and/or provision of power to driven wheel 224, to move the vehicle across a ground surface.

[0030] A variety of play patterns are thus available for use with toy vehicle 210. For example, a user may fill chamber 212 with a mixture of one or more household liquids (such as water, juice, or a carbonated beverage) according to the user's preference. The chamber may then be attached to the toy vehicle chassis. The user may then depress the actuator to prompt the measuring assembly to measure the electrical conductivity of the liquid mixture. The processor assembly may then prompt the response system to produce an output pattern.

[0031] As mentioned above, in the exemplary toy vehicle operating system, the toy output patterns produced by the toy vehicle, or response system 114, are dependent on the electrical conductivity of the liquid body in chamber 212. Thus, the exemplary toy vehicle will respond differently to liquids or liquid mixtures with different conductive properties. As such, the toy vehicle may simulate whether or not a given liquid or liquid mixture is an appropriate "fuel" for the toy vehicle. A user may try several different liquid mixtures in order to discover an optimum "fuel" mixture that produces a preferred output pattern.

[0032] For example, if the conductivity of the liquid or liquid mixture placed in chamber 212 falls within a first conductivity range, the corresponding toy output pattern includes activation of speaker 230 to emit a repeated sound resembling that

of an automobile starter, to indicate that the chosen liquid mixture is not an appropriate "fuel." Alternatively, if the conductivity of the liquid or liquid mixture placed in chamber 212 falls within a second conductivity range, the corresponding toy output pattern includes rapid and repeated activation of lights 228, activation of speaker 230 to emit a sound resembling that of an engine starting and revving at a high rate, and activation of drive assembly 150 to move the vehicle across a ground surface at a high rate of speed, to indicate that the chosen liquid mixture is a powerful "fuel."

[0033] In the exemplary toy vehicle, the level of the toy vehicle's performance increases with the electrical conductivity of the liquid or liquid mixture contained in chamber 212. The following table is an example of six different toy output patterns that may be generated by response system 114, corresponding to six different electrical conductivity ranges. The conductivity ranges are arbitrarily numbered 0-5 to represent nonconductivity (0) to high conductivity (5).

Table 1

Range	Toy output pattern
0	Lights do not flash. "Engine ignition 1" sound plays three times with small pauses. Motor remains off. Vehicle does not move.
1	Lights flash twice per second, for one second. "Engine ignition 1" sound will play at high pitch. Motor on at 100% for short burst, repeated 8 times. Vehicle travels 0,3 - 0,5 metres (1-2 feet)in chugging motion.
2	Lights flash 5 times per second, for one second. "Engine ignition 1" sound will play at medium pitch. Motor on at 50%. Vehicle travels 1,5 - 3 metres (5-10 feet).
3	Lights flash 10 times per second, for one second. "Engine ignition 1" sound will play at low pitch. Motor on at 67%. Vehicle travels 3,6 - 5, 1 metres (2-17 feet).
4	Lights will blink 15 times per second, for one second. "Engine ignition 2" sound will play at high pitch. Motor on at 83%. Vehicle travels 5,1 - 6,7 metres (17-22 feet)
5	Lights will blink 20 times per second, for one second. "Engine ignition 2" sound will play at medium pitch. "Tire squeal" sound will play. Motor on at 100%. Vehicle travels 7,6 - 9,1 metres (25-30 feet).

[0034] The toy vehicle may further include further components to augment the vehicle's simulated reaction to different liquid mixtures. For example, the table above refers to different motor outputs. Thus, drive assembly 150 may include any appropriate systems or devices, such as a feedback mechanism, to govern the output of a motor within the toy vehicle. One example of a feedback mechanism consists of a photodiode and LED, which may be positioned on either side of a tach wheel mounted on an axle. As the axle and the tach wheel rotate, a light beam traveling from the LED may be intermittently received by the photodiode through perforations disposed on the periphery of the tach wheel, which are aligned with the path of the light beam. Processor assembly 130 may be coded to count the number of times the light beam is received by the photodiode during a given time increment. This count may allow the processor to control the drive assembly to increase or decrease the motor output to maintain a consistent given vehicle speed.

[0035] Such a feedback mechanism may optionally be used to allow the toy vehicle to mimic a response to an inappropriate "fuel." For example, processor assembly 130 may be coded to intermittently interrupt the power supply to drive assembly 150, for example, by employing a random number generator or by means of a count of the number of times the light beam is received by the photodiode. This intermittent interruption of power can be incorporated in a set of operational instructions, which can result in a toy output pattern that includes the vehicle moving in a "chugging" motion,

such as to simulate the vehicle's response to an inappropriate "fuel."

[0036] Optionally, the exemplary toy vehicle may be operated independent of the conductivity of a liquid in chamber 212, with no liquid in chamber 212, or with chamber 212 detached from toy vehicle 210. Power switch 234 is selectively movable among an "off" position designated by the number 0, a first "on" position designated by the number 1, and a second "on" position designated by the number 2. The first "on" position allows the toy vehicle to be used with different liquid mixtures as described above, and the second "on" position, for use if a user prefers not to test the toy vehicle's performance using different liquid mixtures, allows the toy vehicle, when actuator 232 is depressed, to respond with a predetermined toy output pattern corresponding to a highly conductive liquid.

[0037] The exemplary toy vehicle described herein is intended to be a non-limiting example of a toy vehicle that may be used with the toy operating systems of the present disclosure. As such, several variations are possible and are within the scope of the disclosure. For example, in some embodiments, the toy operating system may be adapted to couple with one or more liquid chambers simultaneously. In some embodiments, one or more liquid chambers may be permanently coupled with the toy operating system. In such embodiments, a user may be allowed to choose from among several liquid chambers. In some embodiments, a liquid chamber may not include an input port, but may rather contain a liquid in a sealed chamber. In some embodiments, a toy vehicle may include a feature or component that allows the chamber to be automatically emptied in a gradual manner while being operated, simulating the consumption of fuel, such as to enhance entertainment value of the toy vehicle.

[0038] Although the toy and toy operating system disclosed herein have been described in the context of the exemplary embodiment of a toy vehicle, the disclosed toy operating systems may be used with other toys. For example, a toy doll may be used with a toy operating system that prompts different output patterns based on the measurement of a quantitative characteristic of a liquid contained in a detachable chamber configured to resemble a baby bottle, allowing a user to test different liquids to produce a user-preferred response.

[0039] It is believed that the disclosure set forth above encompasses multiple distinct inventions with independent utility. While each of these inventions has been disclosed in its preferred form, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense as numerous variations are possible. The subject matter of the inventions includes all novel and non-obvious combinations and subcombinations of the various elements, features, functions and/or properties disclosed herein. Similarly, where any claim recites "a" or "a first" element or the equivalent thereof, such claim should be understood to include incorporation of one or more such elements, neither requiring nor excluding two or more such elements.

Claims

1. A toy vehicle (210) comprising:

a chassis (220);
at least one toy component operable to display an output;
the toy component including a drive assembly (150) to move the toy vehicle (210) across a ground surface at a plurality of predetermined rates of speed;
a chamber (212) adapted to contain a liquid body (116);
an input system (112) including a measuring assembly (120) configured to measure a predetermined quantitative characteristic of a liquid body (116) contained in the chamber,
characterised in that
the input system (112) is configured to operate the at least one toy component according to one of a plurality of output patterns that corresponds to the measurement;
the input system (112) further includes a processor assembly (130) coupled to the measuring assembly (120);
the processor assembly (130) is configured to produce predetermined operational instructions prompting a corresponding toy output pattern based on the liquid's characteristic as measured by measuring assembly (120),
wherein each of the plurality of output patterns includes operating the drive assembly (150) to move the toy vehicle (210) across a ground surface at a corresponding one of the plurality of predetermined rates of speed.

2. The toy vehicle (210) of claim 1,
wherein the at least one toy component includes an audiovisual assembly (140) to produce a plurality of predetermined audiovisual displays; and
wherein each of the plurality of output patterns includes operating the audiovisual assembly (140) to produce a corresponding one of the plurality of predetermined audiovisual displays.

3. The toy vehicle (210) of claim 1,

wherein the liquid receiving chamber (212) is configured to be detachably coupled to the chassis (220).

4. The toy vehicle (210) of claim 1,
wherein the predetermined quantitative characteristic is electrical conductivity.

5. The toy vehicle (210) of claim 4,
wherein the liquid receiving chamber (212) includes a pair of electrodes (246) protruding into a liquid body (116) contained in the chamber (212), and wherein the input system (112) is adapted to generate an electrical current between the electrodes (246).

6. The toy vehicle (210) of claim 1,
wherein the at least one toy component is configured to be selectively operable independent of a predetermined quantitative characteristic of a liquid body (116) contained in the chamber.

7. The toy vehicle (210) of claim 2,
wherein the audiovisual assembly (140) further includes one or more of: a light assembly (142) including one or more lights (228), and a speaker assembly (144) including one or more speakers.

8. The toy vehicle (210) of claim 1,
wherein the drive assembly (150) further includes a motor assembly (152) including one or more motors, coupled with a driven wheel assembly (154) including one or more driven wheels.

9. The toy vehicle (210) of claim 1,
further including a reservoir (118) for containing a liquid body (116), wherein the reservoir (118) is configured to be detachably coupled with the input system (112).

10. A method of operating a toy vehicle (210) comprising a liquid body (116), comprising:

measuring a predetermined quantitative characteristic of a liquid by a measuring assembly (120), **characterised by** producing predetermined operational instructions representative of the measurement of the liquid characteristic by a processor assembly (130);
selecting one of a plurality of predetermined toy output patterns, wherein the selection is based at least in part on the operational instructions;
operating one or more toy vehicle components (140, 150) according to the selected toy output pattern.

11. The method of claim 10, wherein measuring a predetermined quantitative characteristic of a liquid includes measuring the electrical conductivity of the liquid.

Patentansprüche

1. Spielzeugfahrzeug (210), aufweisend:

ein Fahrgestell (20);
mindestens eine Spielzeugkomponente, die betreibbar ist, um eine Ausgabe zu erzeugen;
wobei die Spielzeugkomponente eine Antriebsanordnung (150) zum Bewegen des Spielzeugfahrzeuges (210) über eine Bodenoberfläche mit einer Vielzahl an vorbestimmten Geschwindigkeitsstufen aufweist;
eine Kammer (212), die zum Beinhalten einer Flüssigkeit (116) ausgelegt ist;
ein Eingabesystem (112), beinhaltend eine Messanordnung (120), die so ausgebildet ist, dass sie eine vorbestimmte quantitative Eigenschaft einer Flüssigkeit (116) messen kann, die in der Kammer enthalten ist,
dadurch gekennzeichnet, dass
das Eingabesystem (112) zum Betreiben der mindestens einen Spielzeugkomponente gemäß eines von einer Vielzahl an Ausgabemustern ausgebildet ist, das der Messung entspricht;
wobei das Eingabesystem (112) weiterhin eine Prozessoranordnung (130) beinhaltet,
die mit der Messanordnung (120) verbunden ist;
wobei die Prozessoranordnung (130) so ausgelegt ist, dass sie vorbestimmte Betriebsanweisungen produzieren kann, die ein entsprechendes Spielzeugausgabemuster veranlassen, das auf der Flüssigkeitseigenschaft, wie durch die Messanordnung (120) gemessen, basiert,

wobei jedes der Vielzahl an Ausgabemustern das Betreiben der Antriebsanordnung (150) zum Bewegen des Spielzeugfahrzeuges (210) über eine Bodenoberfläche mit einer entsprechenden der Vielzahl an vorbestimmten Geschwindigkeitsstufen beinhaltet.

2. Spielzeugfahrzeug (210) nach Anspruch 1,
wobei die mindestens eine Spielzeugkomponente eine audiovisuelle Anordnung (140) zum Produzieren einer Vielzahl an vorbestimmten audiovisuellen Ausgaben beinhaltet; und
jedes der Vielzahl an Ausgabemustern das Betreiben der audiovisuellen Anordnung (140) zum Produzieren einer entsprechenden der Vielzahl an vorbestimmten audiovisuellen Ausgaben beinhaltet.

3. Spielzeugfahrzeug (210) nach Anspruch 1,
wobei die Flüssigkeitsaufnahmekammer (212) so ausgebildet ist, dass sie lösbar mit dem Fahrwerk (220) verbindbar ist.

4. Spielzeugfahrzeug (210) nach Anspruch 1,
wobei die vorbestimmte quantitative Eigenschaft elektrische Leitfähigkeit ist.

5. Spielzeugfahrzeug (210) nach Anspruch 4,
wobei die Flüssigkeitsaufnahmekammer (210) ein Elektrodenpaar (246) aufweist, das in eine Flüssigkeit (116), die in der Kammer (212) enthalten ist, hervorsteht, und wobei das Eingabesystem (112) zum Erzeugen eines elektrischen Stroms zwischen den Elektroden (246) ausgelegt ist.

6. Spielzeugfahrzeug (210) nach Anspruch 1,
wobei die mindestens eine Spielzeugkomponente so ausgelegt ist, dass sie wahlweise betreibbar ist, unabhängig von einer vorbestimmten quantitativen Eigenschaft einer Flüssigkeit (116), die in der Kammer enthalten ist.

7. Spielzeugfahrzeug (210) nach Anspruch 2,
wobei die audiovisuelle Anordnung (114) weiterhin eines oder mehrere aufweist an:

eine Lichtanordnung (142), beinhaltend eines oder mehrere Lichter (228), und eine Lautsprecheranordnung (144), aufweisend einen oder mehrere Lautsprecher.

8. Spielzeugfahrzeug (210) nach Anspruch 1,
wobei die Antriebsanordnung (150) weiterhin eine Motoranordnung (153) aufweist, beinhaltend einen oder mehrere Motoren, die mit einer angetriebenen Radanordnung (154) verbunden ist, beinhaltend eines oder mehrere angetriebene Räder.

9. Spielzeugfahrzeug (210) nach Anspruch 1,
weiterhin aufweisend ein Reservoire (118) zum Beinhalten einer Flüssigkeit (116), wobei das Reservoire (118) so ausgebildet ist, dass es lösbar mit dem Eingabesystem (112) verbindbar ist.

10. Verfahren zum Betreiben eines Spielzeugfahrzeuges (210), aufweisend eine Flüssigkeit (116), aufweisend:

Messen einer vorbestimmten quantitativen Eigenschaft einer Flüssigkeit durch eine Messanordnung (120), **gekennzeichnet durch**
Produzieren von vorbestimmten Betriebsanweisungen, die repräsentativ für die Messung der Flüssigkeitseigenschaft sind, **durch** eine Prozessoranordnung (130);
Auswählen von einem aus einer Vielzahl an vorbestimmten Spielzeugausgabemustern, wobei die Wahl zumindest teilweise auf den Betriebsanordnungen basiert;
Betreiben von einer oder mehreren Spielzeugfahrzeugkomponenten (140, 150) gemäß des ausgewählten Spielzeugausgabemusters.

11. Verfahren nach Anspruch 10, wobei das Messen einer vorbestimmten quantitativen Eigenschaft einer Flüssigkeit das Messen der elektrischen Leitfähigkeit der Flüssigkeit beinhaltet.

Revendications

1. Véhicule jouet (210) comprenant :

un châssis (220) ;
au moins un composant jouet utilisable pour afficher une sortie ;
le composant jouet comprenant un ensemble d'entraînement (150) pour déplacer le véhicule jouet (210) sur une surface de sol à une pluralité de vitesses prédéterminées ;
une chambre (212) adaptée pour contenir un corps de liquide (116) ;
un système d'entrée (112) comprenant un ensemble de mesure (120) configuré pour mesurer une caractéristique quantitative prédéterminée d'un corps de liquide (116) contenu dans la chambre,
caractérisé en ce que :

le système d'entrée (112) est configuré pour actionner le au moins un composant jouet selon l'un d'une pluralité de modèles de sortie qui correspond à la mesure ;
le système d'entrée (112) comprend en outre un ensemble de processeur (130) couplé à l'ensemble de mesure (120) ;
l'ensemble de processeur (130) est configuré pour produire des instructions opérationnelles prédéterminées incitant un modèle de sortie de jeu correspondant basé sur la caractéristique de liquide, comme mesuré par l'ensemble de mesure (120),
dans lequel chacun de la pluralité de modèles de sortie comprend l'actionnement de l'ensemble d'entraînement (150) pour déplacer le véhicule jouet (210) sur une surface de sol à une vitesse correspondante de la pluralité de vitesses prédéterminées.

2. Véhicule jouet (210) selon la revendication 1,
dans lequel le au moins un composant jouet comprend un ensemble audiovisuel (140) pour produire une pluralité d'affichages audiovisuels prédéterminés ; et
dans lequel chacun de la pluralité de modèles de sortie comprend l'actionnement de l'ensemble audiovisuel (140) pour produire un affichage correspondant de la pluralité d'affichages audiovisuels prédéterminés.

3. Véhicule jouet (210) selon la revendication 1,
dans lequel la chambre de réception de liquide (212) est configurée pour être couplée de manière détachable au châssis (220).

4. Véhicule jouet (210) selon la revendication 1, dans lequel la caractéristique quantitative prédéterminée est la conductivité électrique.

5. Véhicule jouet (210) selon la revendication 4,
dans lequel la chambre de réception de liquide (212) comprend une paire d'électrodes (246) faisant saillie dans un corps de liquide (116) contenu dans la chambre (212) et dans lequel le système d'entrée (112) est adapté pour générer un courant électrique entre les électrodes (246).

6. Véhicule jouet (210) selon la revendication 1,
dans lequel le au moins un composant de jouet est configuré pour pouvoir être actionné sélectivement indépendamment d'une caractéristique quantitative prédéterminée d'un corps de liquide (116) contenu dans la chambre.

7. Véhicule jouet (210) selon la revendication 2,
dans lequel l'ensemble audiovisuel (140) comprend en outre un ou plusieurs parmi : un ensemble de lumière(s) (142) comprenant une ou plusieurs lumières (228), et un ensemble haut-parleur(s) (144) comprenant un ou plusieurs haut-parleurs.

8. Véhicule jouet (210) selon la revendication 1,
dans lequel l'ensemble d'entraînement (150) comprend en outre un ensemble de moteur(s) (152) comprenant un ou plusieurs moteurs, couplés avec un ensemble de roue(s) entraînée(s) (154) comprenant une ou plusieurs roues entraînées.

9. Véhicule jouet (210) selon la revendication 1,
comprenant en outre un réservoir (118) pour contenir un corps de liquide (116), dans lequel le réservoir (118) est

configuré pour être couplé de manière détachable avec le système d'entrée (112).

10. Procédé pour exploiter un véhicule jouet (210) comprenant un corps de liquide (116), comprenant :

la mesure d'une caractéristique quantitative prédéterminée d'un liquide au moyen d'un ensemble de mesure (120), **caractérisé par**
la production d'instructions opérationnelles prédéterminées représentatives de la mesure de la caractéristique de liquide, par un ensemble de processeur (130) ;
la sélection de l'un d'une pluralité de modèles de sortie de jouet prédéterminés, dans lequel la sélection est basée au moins en partie sur les instructions opérationnelles ;
l'actionnement d'un ou de plusieurs composants de véhicule jouet (140, 150) selon le modèle de sortie de jouet sélectionné.

11. Procédé selon la revendication 10, dans lequel la mesure d'une caractéristique quantitative prédéterminée d'un liquide comprend la mesure de la conductivité électrique du liquide.

Fig. 1

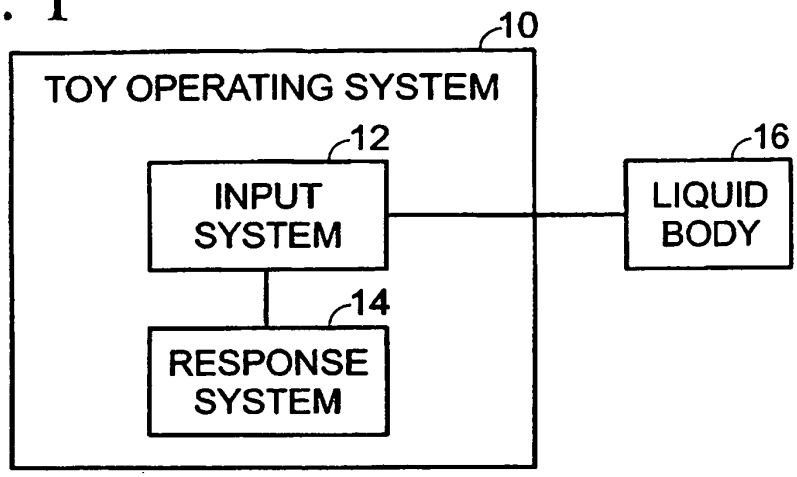

10
TOY OPERATING SYSTEM
12
INPUT SYSTEM
16
LIQUID BODY
14
RESPONSE SYSTEM

Fig. 2

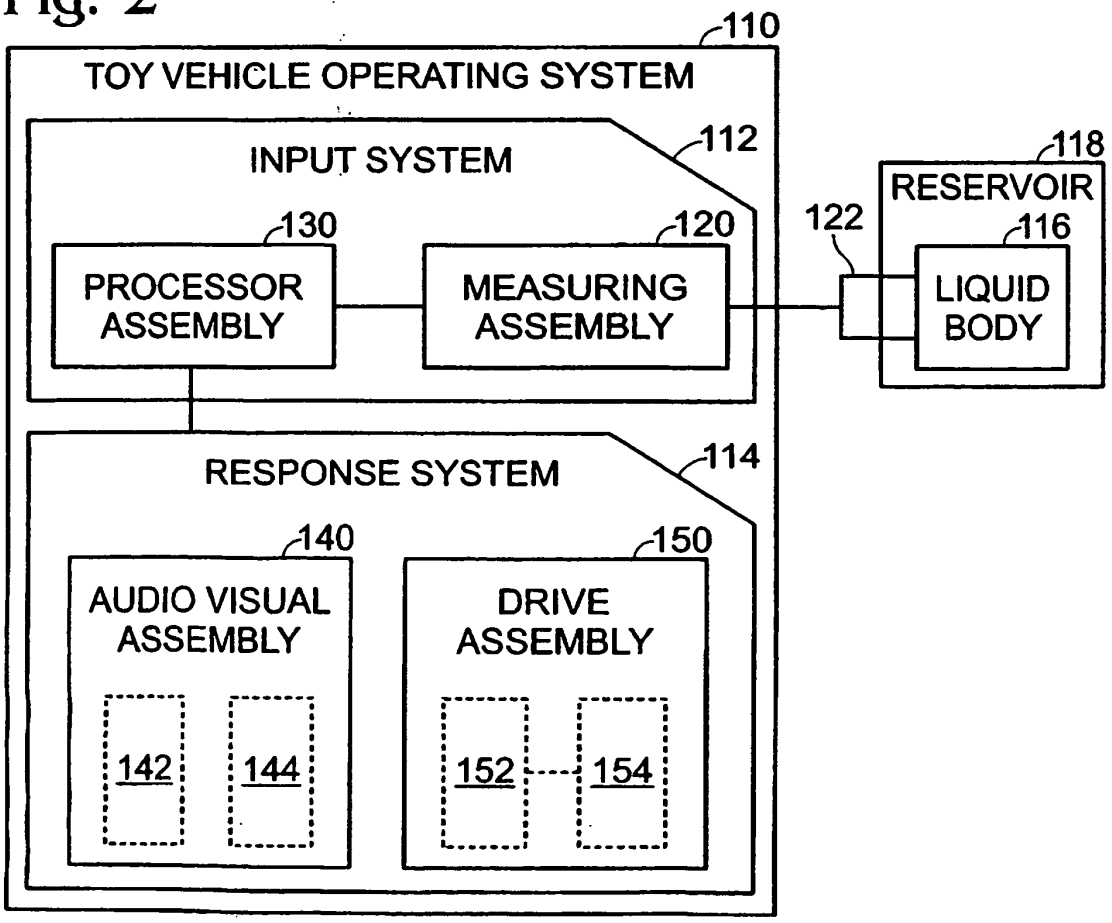

110
TOY VEHICLE OPERATING SYSTEM
112
INPUT SYSTEM
130
PROCESSOR ASSEMBLY
120
MEASURING ASSEMBLY
118
RESERVOIR
122
116
LIQUID BODY
114
RESPONSE SYSTEM
140
AUDIO VISUAL ASSEMBLY
142
144
150
DRIVE ASSEMBLY
152
154

Fig. 3

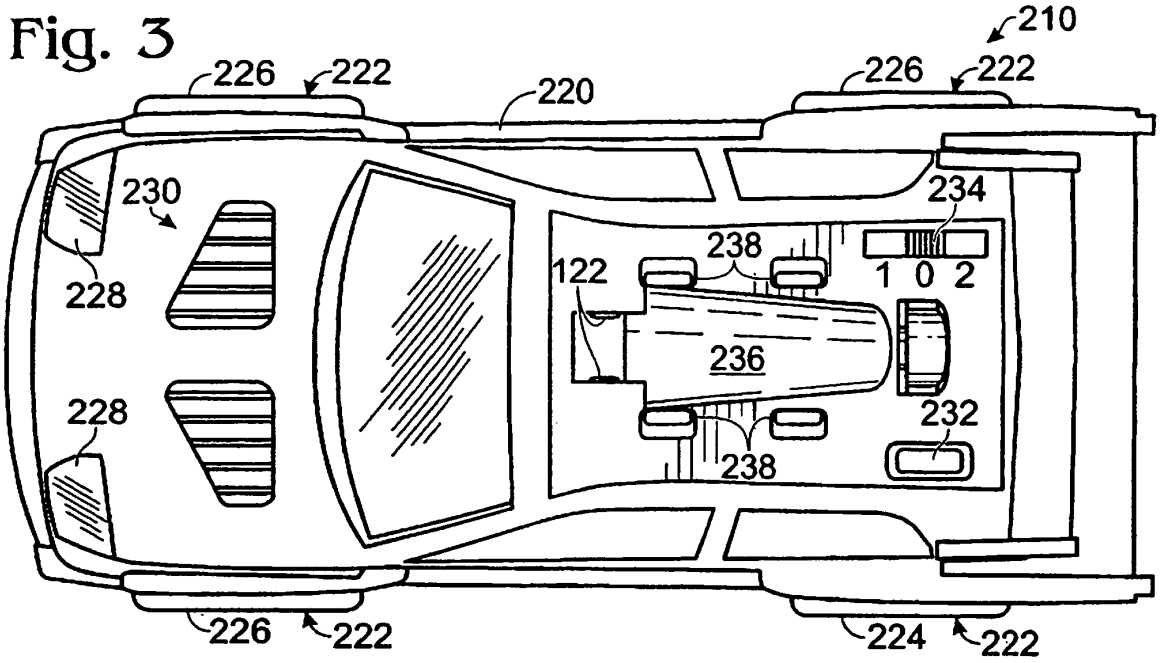


Fig. 4

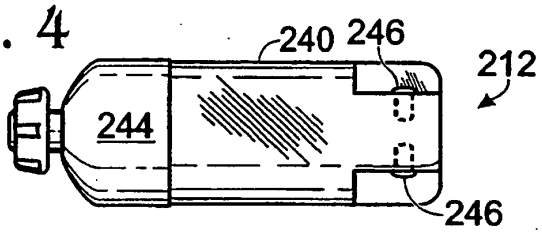


Fig. 5

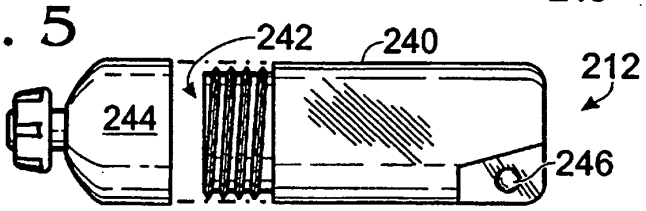


Fig. 6

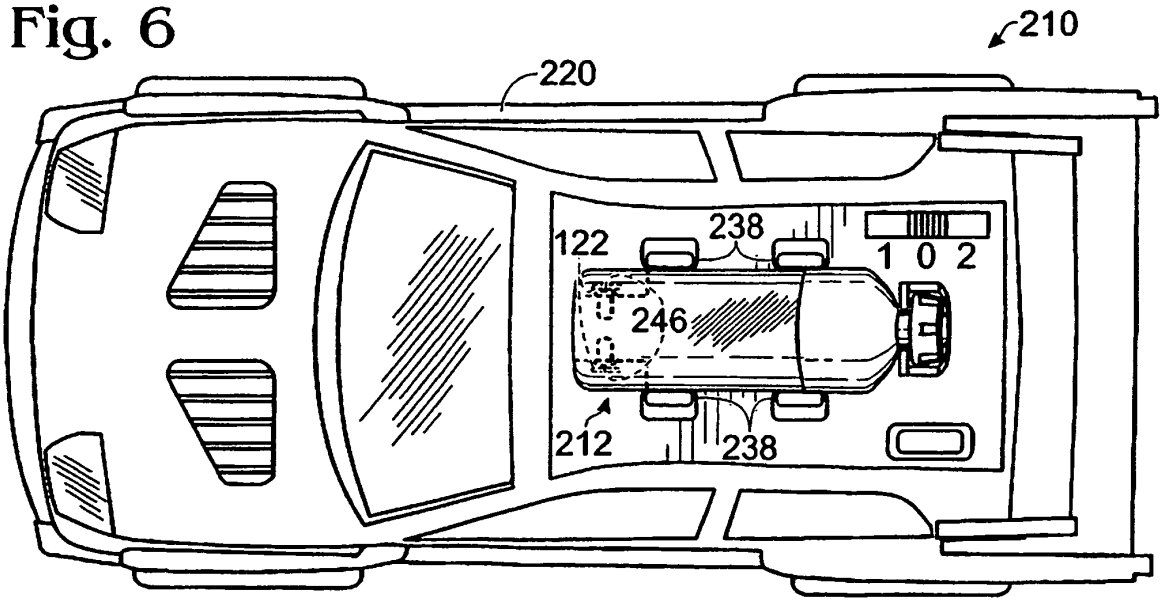


Fig. 8

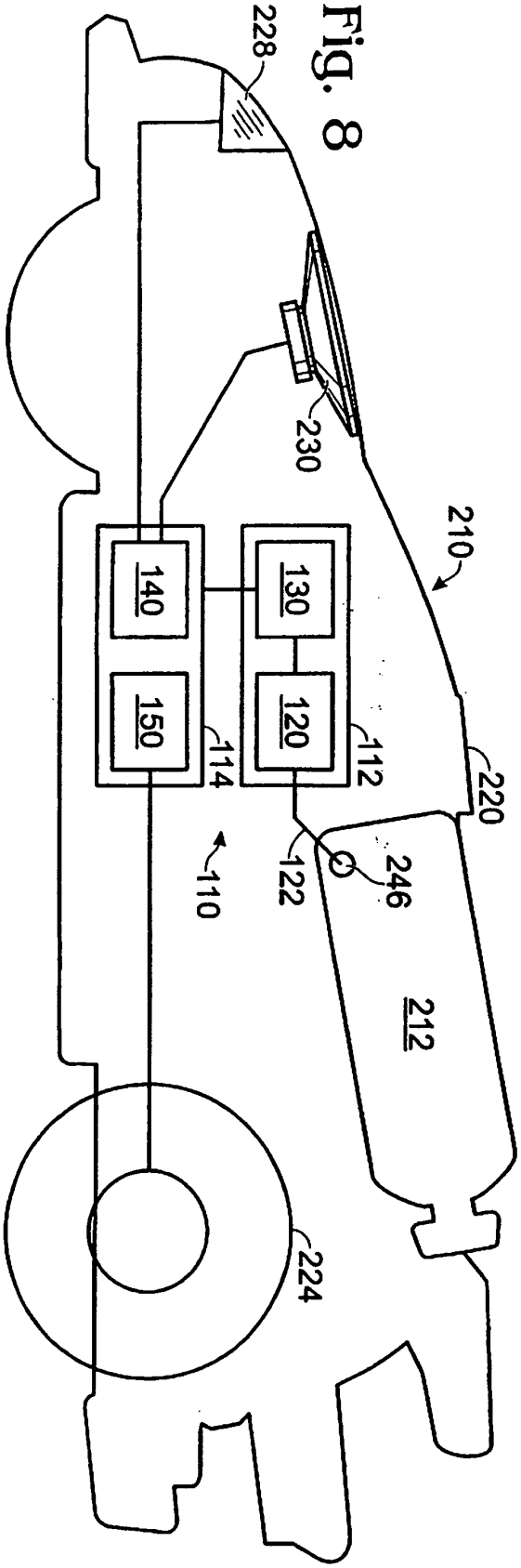
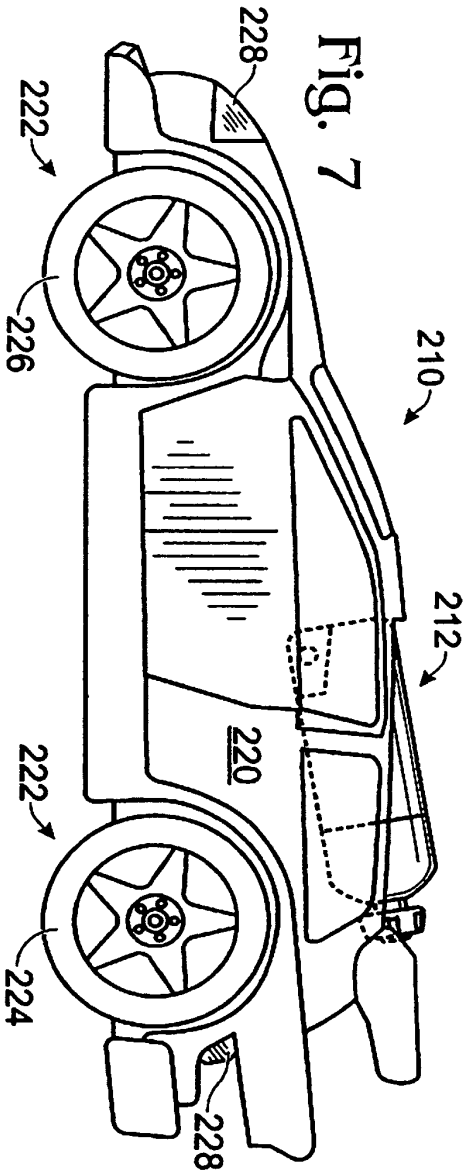

228
230
210
140
130
150
120
114
112
220
110
122
246
212
224

Fig. 7


228
222
226
210
212
220
222
224
228

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 4347683 A **[0004]**
- US 4547169 A **[0004]**
- JP 2000089654 A **[0004]**
- WO 0174463 A **[0004]**