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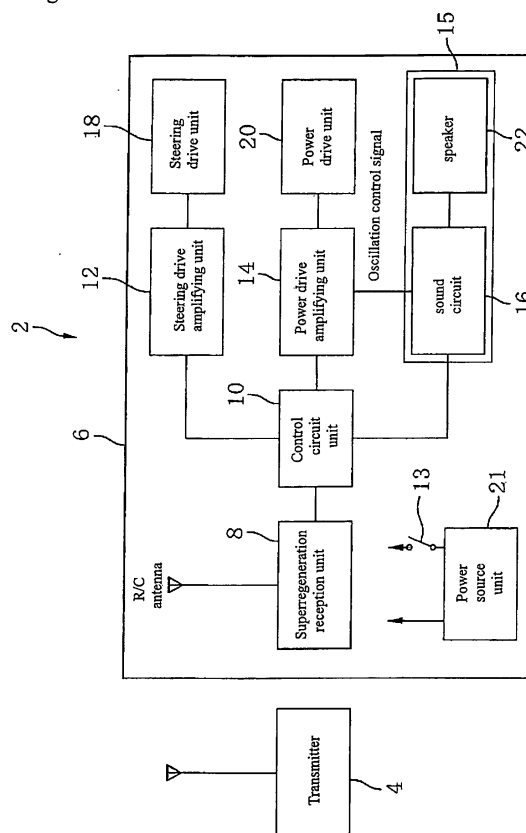
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(54) **REALITY GENERATING DEVICE**

(57) There is provided a device for enhancing a reality of the toy by realizing the sounds and the oscillation of the real article. The device provides an actuation sound generating unit for generating an actuation sound when the toy is actuated and an oscillation generating unit for realizing the oscillation of the running drive unit to generate the actuation sound and the oscillation simultaneously in order enhance the reality of the running toy. The actuation sound generation unit provides a pseudo sound generation means having at least an amplifying circuit and a speaker and a dedicated IC for outputting from the speaker through the amplifying circuit an actuation sound predetermined to cope with the actuation state and an effective sound other than the actuation sound for generating selectively the engine sounds such as the high speed sound, the intermediate speed sound, the low speed sound, the engine racing roar, the idle racing sound or the idling sound and also generating the braking sound, the curve skidding sound and horns.

Fig. 1



Description

Field of the Invention:

[0001] This invention relates to a running toy and more particularly to a reality generating device for the running toy which generates a reality pseudo to a real sound by generating sound and oscillation.

Background of the Invention:

[0002] In order to provide sufficient information for the invention at present, any available references such as the patent publications, the laid-open patent application and the scientific literatures are incorporated into the description of the invention.

[0003] According to the conventional running toy as disclosed in the Japanese Patent Publication No. 2983572 owned by the applicant, a pseudo sound generating device for a radio controlled running toy is provided to generate selectively a high speed sound, an intermediate speed sound, an engine racing roar, an idle racing sound or an idle sound to cope with the running actuation of the radio control car and also to generate emergency braking sound, skidding sound as well as horn sound to enhance the reality.

[0004] The radio controlled toy car disclosed in the mentioned Japanese patent may enhance a reality like a real automobile by generating a sound signal on account of the radio controlled actuation signal by an operator.

[0005] The real motor cars are, however, driven by gasoline engines or diesel engines which are commenced to rotate by a cell motor and oscillations of car bodies are generated by rotations of engines during the idling actuations. Accordingly, the generation of reality due to the sound generation is not substantially realized as compared with the real motor cars.

Disclosure of the Invention:

Subject to be solved by the invention:

[0006] The subject to be solved by the invention is to enhance the reality of the toy by realizing the real toy with generations of sound and oscillation.

[0007] A further aspect of the invention is to enhance the reality by generating an effective sound cooperative with multiple situations.

[0008] Another aspect of the invention is to enhance the reality by generating an oscillation pseudo to that of the real engine oscillation when the pseudo oscillation is required.

[0009] Yet, a further aspect of the invention is to enhance the reality efficiently by minimizing components of the toy of the conventional art.

[0010] Still another aspect of the invention is to enhance the reality by generating an oscillation with rotation

of the tires in utilization of the conventional toy.

[0011] A further aspect of the invention is to enhance the reality by aligning a wheel cap actuation with the oscillation generated by the tire rotation.

[0012] Moreover, another aspect of the invention is to enhance the reality considerably by transmitting the generated sound more explicitly.

Measures to solve the subject:

[0013] According to the invention, there is provided a reality generating device which is equipped with an actuation sound generating unit for generating an actuation sound of the toy and an oscillation generating unit for realizing the oscillation of the running driver unit so that when desired the actuation sound and the oscillation are generated simultaneously to enhance the reality of the running toy.

[0014] The actuation sound generating unit provides a pseudo sound generating means having at least an amplifying circuit and a speaker and a dedicated integrated circuit arranged to operate outputs from the speaker of an actuation sound predetermined to cope with the actuation condition and of an effective sound other than the actuation sound through the amplifying circuit so that the engine sounds may selectively be generated as a high speed sound, an intermediate speed sound, a low speed sound, an engine racing roar, an idling racing sound or an idling sound and further a braking sound, a curve slipping sound or a horn sound may be generated.

[0015] The oscillation generating unit may transmit a signal for generating a predetermined oscillation frequency and an oscillation.

[0016] The running toy comprises a radio controlled running toy which provides a circuit for receiving a radio-controlled signal, a decoder circuit for decoding the received signal for output of the decoded output signal, a motor driving circuit and a steering driving circuit connected to the decoder circuit for driving the motor unit and the steering unit respectively, a pseudo sound generating device having a power switch, an amplifying circuit and a speaker, said pseudo sound generating device is equipped with a microcomputer which receives each output signal corresponding to the running modes of the decoder circuit and also an actuation signal of the power switch and programmed to generate a sound output from a speaker through the amplifying circuit which is selected from an engine sound previously programmed to accord with the running mode or an effective sound other than the engine sound in order cope with the input signal and also to generate the oscillation signal in accordance with the engine sound to actuate the driving actuation by means of the power motor drive circuit so that a cell sound may be generated by the power switch and actuations of an advance key, a back key and a turbo key may selectively generate the engine sounds of the high speed, the intermediate speed and the low speed as well as the

engine racing roar, the idle racing sound and the idling sound so that the oscillation is synchronized with the engine racing roar, the idle racing sound and the idling sound.

[0017] It is normal to use a PCM signal or an analogue signal for the radio controlled actuation signal. The timing of the idling, the volume of the sound as well as the generation time may be specified in a particular time, but may also be varied optionally. The idling is not determined by a particular signal but assessed upon detection of the free signal status. The oscillation signal is put to rotate the motor in opposite directions.

[0018] The oscillation similar to that of the real motor car may be obtained by a discontinuous rotation of the motor of the running toy and for that purpose a piezo element may be used for the vibrator to generate an oscillation.

[0019] In the running toy according to the invention, wheels are mounted through a wheel shaft to the motor unit and provides a wheel tire unit, a first wheel cap inserted into the tire for mounting the wheel shaft and a second wheel cap rotatably mounted to the wheel shaft in order to enhance the reality of the actuation of the wheel cap.

[0020] The running toy according to the invention is comprised of a motor unit, a chassis mounting a steering unit and a speaker and a body covering the chassis and characterized in that between the body and the chassis is provided a clearance for passing the sound.

[0021] Another aspect of the invention is to provide a reality generating device for enhancing the reality of the running toy by generating an actuation sound of the toy in driving and generating an oscillation for realizing the oscillation of the driven unit of the running toy, while by generating the driving sound and the oscillation simultaneously when desired.

[0022] The reality generating device according to the invention is further characterized in that the actuation sound previously determined to cope with the actuation mode and the effective sound other than the actuation sound are output from the speaker through the amplifying circuit in order to generate selectively the high speed sound, the intermediate sound, the low speed sound, the engine racing roar, the idle racing sound or the idling sound of the engine sounds with the braking sound, the curve skidding sound or the horn sound.

[0023] The sounds mentioned may be memorized as the sound sources in the semiconductor memory in the microcomputer such as ROM and the like but they may be generated every time by providing the oscillation source. The sounds mentioned are not of course limitative but the memorized horns may be regenerated to enhance the reality.

[0024] According to the embodiments of the invention, the sounds are always generated, notwithstanding provision may be made of a silent mode for not generating any sound.

[0025] A third aspect according to the invention is to

provide a reality generating program in which an actuation sound of the toy in driving is generated and an oscillation for realizing the oscillation of the driven part of the running toy is generated and further the actuation sound and the oscillation are generated simultaneously in order to enhance the reality of the running toy.

[0026] The reality generating program according to the invention is characterized in that an actuation sound previously provided to cope with the actuation mode and an effective sound other than the actuation sound are subjected to an output actuation from the speaker through the amplifying circuit and that the high speed sound, the intermediate sound, the low sound, the engine racing roar, the idle racing sound or the idling sound of engine sounds are selectively generated and that the braking sound, the curve skidding sound or the horns are generated.

Effect of the Invention:

[0027] The reality generating device according to the invention provides an actuation sound generating unit for generating an actuation sound of the toy in driving and an oscillation generating unit for realizing an oscillation of the driven part of the running toy and when desired the actuation sound and the oscillation sound are generated simultaneously to enhance the reality of the running toy so that a real article may be realized with applications of the sound and the oscillation.

[0028] Further, the sound generating unit provides at least an amplifying circuit, a pseudo sound generating means and a dedicated integrated circuit arranged to output the actuation sound previously designed to cope with the actuation mode and the effective sound other than the actuation sound from the speaker through the amplifier circuit so that the high speed sound, the intermediate speed sound, the low speed sound, the engine racing roar, the idle racing sound or the idling sound may selectively be generated and further the braking sound, the curve skidding sound or horns may be generated in order to obtain the most effective sounds which cope with multiple situations.

[0029] Moreover, the oscillation generating unit transmits a signal for generating a predetermined oscillation frequency and an oscillation to the driving unit of the running toy so that more realistic and accurate oscillation may be generated.

[0030] The radio controlled running toy employed in the present invention provides a reception circuit for receiving a radio controlled signal, a decoder circuit for decoding the received circuit and outputting a decode output signal, a power motor drive circuit, a steering drive circuit connected to the decode circuit for driving the motor unit and the steering unit respectively by the decode output signal and the running toy provides a power switch, an amplifying circuit and a pseudo sound generating means in which a microcomputer is arranged to input thereto each signal which copes with the running

mode of the decoder circuit and the actuation signal of the power switch as the input signals. The microcomputer is further programmed to operate an output from the speaker through the amplifying circuit a sound which copes with the input signal selected from the engine sound previously programmed to cope with the running mode and the effective sound other than the engine sound and to generate a signal for oscillation together with the engine sound so that the driving actuation takes place by means of the power motor driving circuit. The power switch may generate a cell sound and the actuations of the advancement key, the backing key, the turbo key and the left and right keys may selectively generate the high speed sound, the intermediate sound, the low sound, the engine racing roar, the idle racing sound and the idling sound of the engine with the braking sound, the curve skidding sound or the horns, while the oscillation of the motor unit is synchronized with the engine racing roar, the idle racing sound or the idling sound in the form of the minimum structure for addition to the conventional toy in order to enhance the reality more efficiently.

[0031] The reception circuit is comprised of an antenna for receiving a control signal from the transmitter and a superregeneration circuit or a signal reception unit which demodulates PCM signal from the high frequency signal.

[0032] The decoder circuit or the control circuit demodulates the control signal from PCM signal to provide a decode output signal which upon transmission controls each driven units of the power motor drive circuit and the steering drive circuit and the micro-computer.

[0033] The microcomputer or the sound circuit unit is a dedicated computer which contains therein ROM and a central actuation element and provides a sound driving unit for actuating the speaker and an interface for transmitting the driving signal to the power motor drive circuit for generating the oscillation.

[0034] The motor unit or the power driving unit involves a motor for driving the wheels and is driven by the power motor drive circuit.

[0035] The steering unit or the steering drive unit is front wheels steering means and is driven by the steering drive circuit to determine an advancing direction of the running toy.

[0036] The power motor drive circuit or the power drive amplifying unit is to control the current of the power motor by the decoder circuit or the microcomputer, for example, by controlling the variable resistance by the servo-motor.

[0037] The steering drive circuit or the steering drive amplifying unit is to drive the steering unit in accordance with a signal from the decoder circuit.

[0038] The signal for oscillation is provided to rotate the motor in opposite directions so that the oscillation is generated by rotations of tires.

[0039] To the motor unit are coupled through the wheel shaft the wheels which include tires, a first wheel cap which is inserted into the tires and fixed to the wheel shaft and a second wheel cap which is rotatably mounted to

the wheel shaft so that the reality of the actuation of the wheel cap in oscillation may be enhanced in order obtain a spontaneous actuation of the wheel cap of the running toy.

[0040] Between the chassis for bearing the motor unit, the steering unit and the speaker and the body unit for coating the chassis is provided a clearance for passing the sound in order to enhance the reality.

Best mode for embodying the invention:

[0041] The examples according to the invention shall be described hereinafter with reference to the appended drawings.

Examples:

[0042] Figure 1 is a graphical view of the reality generating device according to the invention. According to this example, the reality generating device 2 is applied to the radio controlled motor toy car and a system block is as shown Figure 1. A reality generating device 2 is comprised of a control transmitter 4 and a running body or radio controlled motor toy car 6 having an antenna and provides a superregenerating reception unit 8 for receiving the radio controlled signal, a control circuit unit 10 for decoding the received signal and a steering drive amplifying unit 12 and a power drive amplifying unit 14 for driving the steering drive unit 18 and the power drive unit 20 respectively in accordance with an output of the control circuit 10. The running toy is provided with a pseudo sound generating device 15 including a power switch SW 13, a power drive amplifying unit 14 and a speaker 22. In the pseudo sound generating device 15 is arranged a sound circuit unit or a microcomputer 16 into which each output signal which copes with the running mode of the decoder circuit and an actuation signal of the power switch is input as an input signal and a sound which copes with the input signal selected from the engine sound previously programmed to cope with the running mode and the effective sound other than the engine sound is output from the speaker through the amplifying circuit and with the engine sound the oscillation signal is generated to perform a driving actuation through the power motor drive circuit.

[0043] The superregenerating reception unit 8 arranged in the radio controlled motor toy car 6 receives a signal transmitted from the control remitter 4 and the received radio controlled is converted into a signal for controlling the steering drive unit 18 and the power drive unit 20 respectively at the control unit 10 connected to the superregenerating reception unit 8 and then transmitted to the steering drive amplifying unit 12 and the power drive amplifying unit 14 and the same signal drives the units 18 and 20. Thus, the radio controlled motor toy car 6 conducts the advancing and backing actuations as well as the left and right turning actuations in accordance with the actuation sticks (not shown) arranged in the control

transmitter 4. When a power switch 13 of the radio controlled motor toy car 6 is put on the radio controlled signal from an output terminal of the control circuit 10 is received by the sound circuit 16 as an input signal and generates from the speaker the pseudo sound which copes with various actuation modes of the radio controlled motor toy car and the controlled oscillation signal is output to the power drive unit 20 by means of the power drive amplifying unit 14 connected to the sound circuit unit 16 which generates the pseudo sound and the oscillation according to the program stored in ROM not shown.

[0044] Generation system of the pseudo sound shall be described hereinafter in detail with reference to the appended drawings of Figure 2 to Figure 4B which are the flow chart Figures illustrative of the generation processes of various pseudo sounds and the oscillations by the sound circuit 16 in accordance with the running modes of the motor toy car operated under the radio controlled actuation and the radio controlled motor car toy shown in Figure 5 as an example is a racing car.

[0045] Figure 2 is a flow chart of the actuation of the reality generating device according to the invention in which the generation systems of the pseudo sound and the oscillation exercised in the sound circuit 16 are as follows. Namely, when the main power switch of the racing car is put on, then the sound circuit unit 16 regenerates the starter sound. Then, the starter sound data previously memoried in ROM are read out for composite tone which is in turn transmitted to a speaker 22 for generation of the starter sound (T2). This starter sound is a rotary sound of the cell motor of the real motor car when started and memoried previously in ROM. Subsequently, into the sound circuit 16 is input a start on signal of the idling signal for generating the idling sound (T4). The idling sound is generated from the speaker through the amplifying circuit arranged in the sound circuit unit 16. Simultaneously, the sound circuit 16 generates the oscillation which is read out from ROM.

[0046] Figure 4A is a wave form diagram of the oscillation signal of the exemplified reality generating device according to the invention. This oscillation signal wave form intends to vibrate the voltage $\pm A$ volt per the time $t_1=100\sim 150$ ms. When the oscillation wave form is applied to two terminals provided the power driving unit, the tires are driven at the rotary angle of ± 0.5 per the time $t_1 = 100 \sim 150$ ms. The sound circuit unit 16 when no signal is received the control circuit unit 10 transmits the signal per $100 \sim 150$ ms to the power driving oscillation 14 which drives the power driving unit 20 at the same timing so that the tires make a weak oscillation (T6). After measurement of a particular time, for example an approximate time of from 2~4 sec. by means of a timer program arranged in the sound circuit unit 16. After measurement taken place the sound circuit 16 regenerates an engine racing roar sound (T). The sound circuit unit 16 reads out engine racing roar sound from ROM and synthesizes the sound for transmission the speaker 22 in order to regenerate the engine facing roar sound.

[0047] The sound circuit 16 also regenerates an oscillation and reads out the oscillation data from ROM. Figure 4B is a wave form diagram of the oscillation signal of the reality generating device of another example according to the invention. The wave form of the oscillation signal of Figure 4B is for vibrating the voltage $\pm A$ volt per the time $t_2 = 60 \sim 90$ ms. The frequency is preferably shorter than the wave form shown in Figure 4A ($t_1 > t_2$). When the wave form is applied to two terminals provided in the power driving unit, tires are driven at the rotary angle ± 0.5 per the time $t_1 = 60 \sim 90$ ms.

[0048] The sound circuit 16 after the idling sound is generated transmits the signal per 60~90 the power driving amplifier unit 14 which drives the power driving unit 20 at the same timing for generating a weak oscillation of the tires (t10). The short oscillation frequency represents an increment of the rotation of the engine on account of an elevation of the oscillation frequency.

[0049] When a turbo key of the transmitter is put on, the step is shifted to B 1 of Figure 3A which is a flow chart of the turbo key of another example of the reality generating device according to the invention.

[0050] When the turbo key is selected for the on state in the reality generating device, the high speed driving signal is transmitted to the power driving amplifier unit 14 through the superregenerating reception unit 8 and the control circuit unit, so that a weak oscillation due to the reality generating device is discontinued (3A2) to start the high speed driving. Simultaneously, the turbo key on signal is transmitted through the superregenerating reception unit 8, while the idling sound or the engine racing roar sound is discontinued to read out the high speed sound data from ROM and the high speed sound data is regenerated (3A6).

[0051] Then, the reality generating device is left in waiting the left and right keys actuation (3A8). When the left and right keys are not in actuation, the high speed driving and regeneration of the high speed sound data are continued to wait the turbo key return (3A14), whereas when the left and right keys are operated, the left and right steerings take place by means of the steering drive unit 18 through the superregenerating reception unit 8 and the control circuit unit 10 and simultaneously the signal is transmitted to the sound circuit unit 16 through the control circuit 10 and the skid sound data are read out from ROM to regenerate the skidding sound from the speaker (3A12) for subsequent waiting of the turbo key (3A14).

[0052] When the turbo return is not input even in waiting, the left and right keys actuation is again left in waiting (3A8). On the other hand, when the turbo key return is input the high speed drive signal is transmitted to the power drive amplifier 14 for reduction of the speed through superregenerating reception unit 8 and the control unit 10 of the reality generating device. Simultaneously, the signal is transmitted to the sound circuit 16 through the control circuit 10 and the skidding sound data are read out from ROM to regenerate the skidding sound

from the speaker 22 (3A16) for subsequent return to A1 of Figure 2.

[0053] When the turbo key of the transmitter is put off while the forward key is put on, the step is shifted to B2 of Figure 3B which is a flow chart of the forward key of an example of the reality generating device according to the invention.

[0054] When the forward key is put on, an intermediate signal is transmitted to the power drive amplifier unit 14 through the superregenerating reception unit 8 and the control circuit unit 10 to discontinue a weak oscillation (3A2) so that the intermediate drive signal of the power drive amplifying unit 14 is started (3A4). Simultaneously, the forward key on signal is transmitted to the sound circuit unit 16 through the superregenerating, while the idling sound or the engine racing roar are discontinued to read out the high speed data from ROM and to regenerate the high speed sound data from the speaker 22 (3A6).

[0055] Then, the left and right keys actuation is left on waiting (3A8). When the left and right keys are not operated, regenerations of the high speed driving and the high speed sound data are continued for waiting the turbo key return (3A14). When the left and right keys are on actuation, the left and right steering takes place (3A10) by means of the steering drive unit 18 through the superregenerating reception 8 and the control circuit 10 and simultaneously the signal is transmitted to the sound circuit 16 through the control circuit 10 and the skidding sound data are read out from ROM for regeneration of the skidding sound data from the speaker 22 (3A12) for subsequent waiting step of the turbo key return (3A14).

[0056] In the waiting position of the turbo key return, when the turbo key return is not input, the left and right keys actuation is again left in the waiting position (3A8). When the turbo key return is input, however, the high speed drive signal is transmitted to the power drive amplifying unit 14 through the regeneration reception unit 8 and the control circuit 10 of the reality generating device. Simultaneously, the signal is transmitted to the sound circuit unit 16 through the control circuit 10 and the brake sound data readout from ROM for regeneration of the brake sound data from the speaker 22 (3A16) for subsequent A1 step of Figure 2.

[0057] When the turbo key is put off in the transmitter while the forward key is put on, the actuation is shifted to B2 of the Figure 3B which is a flow chart of the forward key of the reality generating device.

[0058] When the forward key is put on, the intermediate speed drive signal is transmitted to the power drive amplifier 14 through the superregenerating reception unit 8 and the control circuit unit 10 so that the weak oscillation is discontinued (3B2) for starting the intermediate speed drive of the power drive amplifier unit 14 (3B4). Simultaneously, the forward key on signal is transmitted to the sound circuit unit 16 through the superregeneration reception unit 8 to discontinue the idling sound or the engine racing roar and the intermediate sound data is read out

from ROM for regeneration of the intermediate speed sound data from the speaker 22 (3B6).

[0059] The left and right keys actuation stands by (3B8). When the key actuation is discontinued the generations of the intermediate speed drive and the intermediate sound data are continued for waiting the forward key return (3B 14). When the left and right keys actuation takes place, the left and right keys actuation performs the left and right steering by the steering drive unit 18 through the superregeneration reception unit 8 and the control circuit unit 10 and simultaneously the signal is transmitted to the sound circuit unit 16 through the control circuit unit 10 to read out the skid sound data from ROM for regeneration of the skid sound data from the speaker 22 (3B12) and then the forward key stands by (3B 14). When the forward key return is not input during the forward key stands by for return, the reality generating device again stands by for the left and right keys actuation (3B8).

[0060] When the forward key return is input the signal is transmitted to the power drive amplifying unit 14 for reduction of the high speed drive through the superregeneration reception unit 8 and the control circuit unit 10. Simultaneously, the signal is transmitted to the sound circuit unit 16 for reduction of the high speed drive through the control circuit unit 10 to read out the brake sound data from ROM for regeneration of the brake sound data from the speaker 22 (3B16) and subsequent return to A1 step of Figure 2.

[0061] When the turbo key of the transmitter is put off while the back key is put on, the step is shifted to B3 of Figure 3C which is a flow chart of the back key of the exemplified reality generating device according to the invention.

[0062] When the back key is put on, the back key drive signal is transmitted to the power drive amplifying unit 14 through the superregeneration reception unit 8 and the control circuit 10 to discontinue the weak oscillation (3C2) while the back drive is started (3C4). Simultaneously, the back key on signal is transmitted to the sound circuit unit 16 through the superregeneration reception unit 8 to discontinue the idling sound or the engine racing roar so that the low speed sound data is read out from ROM for regeneration of the low speed sound from the speaker 22 (3C6).

[0063] The left and right keys stand by actuation (3C8). When the left and right keys are not on actuation, the generations of the back drive and the low speed sound are continued to stand by the back key (3C14). When the left and right keys are on actuation, the left right steering takes place by the steering drive unit 18 (3C10) through the superregeneration reception unit 8 and the control circuit 10. Simultaneously, the signal is transmitted to the sound circuit unit 16 through the control circuit 10 to read out the skid sound data from ROM for regeneration of the skid data from the speaker 22 (3C12). Thereafter, the back key stands by for return (3C14).

[0064] In Figure 2, when the back key is not selected

the main switch 13 for power source of the racing car stands by for actuation (T20). In case the power source switch 13 is selected, the step A1 discontinues again the idling sound (T22) and also the oscillation (T24).

[0065] As shown in Figure 1, the reality generating device according to the invention may provide the sound circuit 16 for receiving an actuation processing signal from the control circuit 10, the power on-off switch 13, the power drive amplifying unit 14 and the speaker 22 for conveniently obtaining a compact device and variations of the pseudo sound generation control and the oscillation control may be carried by merely changing the program energized by the sound circuit unit 16 arranged in ROM and various pseudo sounds and oscillations may be realized according to the situations and environments.

[0066] The realities of examples according to the invention may further be enhanced as shown Figures 5 and 9. Figure 5 is a perspective view of the radio controlled racing car toy providing the reality generating device according to the invention in which the radio controlled toy car 6 comprises the body 30 and the chassis providing a tire 32a and a tire 32b together with head lights 36a and 36b. Further, the control circuit 10 is connected to a lamp or LED arranged in the head lights 36a and 36b for lighting in association with starting of the turbo key and the forward key so that the reality is considerably enhanced.

[0067] Figure 6 is a graphical view of the radio controlled toy car from which the body 30 is removed. On the chassis 18 are arranged the speaker 22 the power drive unit 20 and the steering drive unit 18 not shown.

[0068] Figure 7 is a bottom view of the radio controlled toy car 6 in which large openings 42a and 42b are respectively provided between the lateral faces 38a and 38b in the advancing direction of the chassis 38 and the side moles 40a and 40b in the same direction of the body 30. On account of such arrangement, the sound is externally loudened from the speaker 22 arranged on the chassis through the openings 42a and 42b so that the sounds may be generated from the inside and bottom of the radio controlled toy car 6.

[0069] Figures 8 and 9 are enlarged views of the wheels 32a and 32b of the radio controlled toy car 6 in which into the tire 48a is inserted the wheel cap 44b to fix to the wheel shaft 46 in the center of the tire. Further, the wheel cap 44a having spokes of the same number against the wheel caps 44b is rotatably mounted to the wheel shaft 46 so that the wheel 44a is left not to rotate due to an inertia even the wheel cap 44b is vibrated.

Industrial Applicability:

[0070] The radio controlled toy car according to the invention may enhance the reality of the running toy and offer more realistic toys to the toy markets.

[0071] Some preferred modes and examples of the invention have been described for convenience in understanding the invention but the description should be con-

sidered as limitative even various modifications or replacements are available for anyone skilled in the arts, notwithstanding such modifications and replacements shall of course fall within the technical scope of the invention.

Brief Description of the Drawings:

[0072]

- Fig. 1 is a graphical view of an example of the reality generating device according to the invention.
- Fig. 2 is a flow chart of an example of the reality generating device according to the invention.
- Fig. 3A is a flow chart of a turbo gear of the reality generating device according to the invention.
- Fig. 3B is a flow chart of a forward key of the reality generating device according to the invention.
- Fig. 3C is a flow chart of a back key of the reality generating device according to the invention.
- Fig. 4A is a wave form diagram of an oscillation signal of the reality generating device according to the invention.
- Fig. 4B is a wave form diagram of an oscillation signal of the reality generating device according to the invention.
- Fig. 5 is a perspective view of the radio controlled running toy provided with a reality generating device according to the invention.
- Fig. 6 is a graphical view of the chassis of the radio controlled running toy providing the reality generating device according to the invention.
- Fig. 7 is a bottom view of the chassis of the radio controlled running toy providing the reality generating device according to the invention.
- Fig. 8 is an enlarged diagram of the wheels of the radio controlled running toy providing the reality generating device according to the invention.

Claims

1. A reality generating device which is equipped with an actuation sound generating unit for generating an actuation sound when a toy is operated and an oscillation generating unit for realizing an oscillation of the running drive unit and when desired the actuation sound and the oscillation are generated simultaneously to enhance a reality of the running toy.
2. A reality generating device as claimed in claim 1, wherein the actuation sound generating unit provides at least an amplifying circuit and a pseudo-sound generating means having a speaker and a dedicated IC arranged to output from the speaker the actuation sound previously settled to cope with the actuation state and an effective sound other than

the actuation sound through the amplifying circuit so that an engine sound may include a high speed sound, an intermediate speed sound, a low speed sound, an engine racing roar, an idle racing sound, an idling sound, a braking sound, a curve skidding sound and horns.

3. A reality generating device as claimed in claim 1, wherein the oscillation generating unit transmits to the running drive unit a signal for generating a pre-determined oscillation frequency and oscillation.
4. A reality generating device as claimed in claim 1, wherein the radio controlled running toy provides a reception circuit for receiving the radio controlled signal, a decoder circuit for decoding the received signal for output as a decode output signal, a power motor drive circuit and a steering drive circuit connected to the decoder circuit for driving a motor unit and a steering unit respectively in accordance with the decode output signal, a power switch and a pseudo sound generating means having an amplifying circuit and a speaker, said pseudo sound generating means being equipped with a microcomputer settled to use the output signals corresponding to the running state of the decoder circuit and an actuation signal of the power switch as an input signal and to output from the speaker through the amplifying circuit a sound corresponding to said input signal selected from the engine sound previously programmed to cope with the running state and the effective sound other than the engine sound and further to form an oscillation signal in addition to the engine sounds for providing a drive actuation by the power motor drive circuit, said power switch being capable of generating a cell sound, an advancing key, a backing key, a turbo key and a left-right key being operated to generate selectively the engine sounds of high speed sound, intermediate speed sound, low speed sound, engine racing roar, idle racing sound or idling sound with braking sound, curve skidding sound or horns being generated together and the motor unit oscillation being synchronized with said engine racing roar, idle racing sound or idling sound.
5. A reality generating device as claimed in claim 4, wherein the oscillation signal is settled to rotate the motor in opposite directions.
6. A reality generating device as claimed in claim 4, wherein the oscillation signal is settled to rotate the motor in one direction.
7. A reality generating device as claimed in claim 4,

the tire to fix to the wheel shaft and a second wheel cap rotatably mounted to the wheel shaft so that the reality of the actuation of the wheel cap upon oscillation is enhanced.

8. A reality generating device as claimed in claim 4, the running toy comprises a chassis for bearing the motor unit, the steering unit and the speaker and a body for housing the chassis and provision is made of a clearance between the body and the chassis.
9. A method of generating a reality of the running toy which comprises steps of generating an actuation sound when the toy actuates, generating an oscillation for realizing the oscillation of the running drive unit and generating when desired the actuation sound and the oscillation simultaneously to enhance the reality.
10. A method of generating the reality as claimed in claim 9, wherein the actuation sound previously determined to cope with the actuation state and the effective sound other than the actuation sound are output through the speaker to generate the engine sounds of the high speed sound, the intermediate sound, the low sound, the engine racing roar, the idle racing sound or the idling sound selectively and further to generate the braking sound, the curve skidding sound and horns.
11. A reality generating program which generates the actuation sound of the toy upon actuation, the oscillation for realizing the actuation of the running toy drive unit and the actuation sound and the oscillation simultaneously when desired.
12. A reality generating program as claimed in claim 11, wherein the actuation sound previously determined to cope with the actuation state and the effective sound other than the actuation sound are output through the speaker through the amplifying circuit for generating the engine sounds of the high speed sound, the intermediate speed sound, the low speed sound, the engine racing roar, the idle racing sound or the idling sound selectively and further to generate the braking sound, the curve skidding sound and horns.

Fig. 1

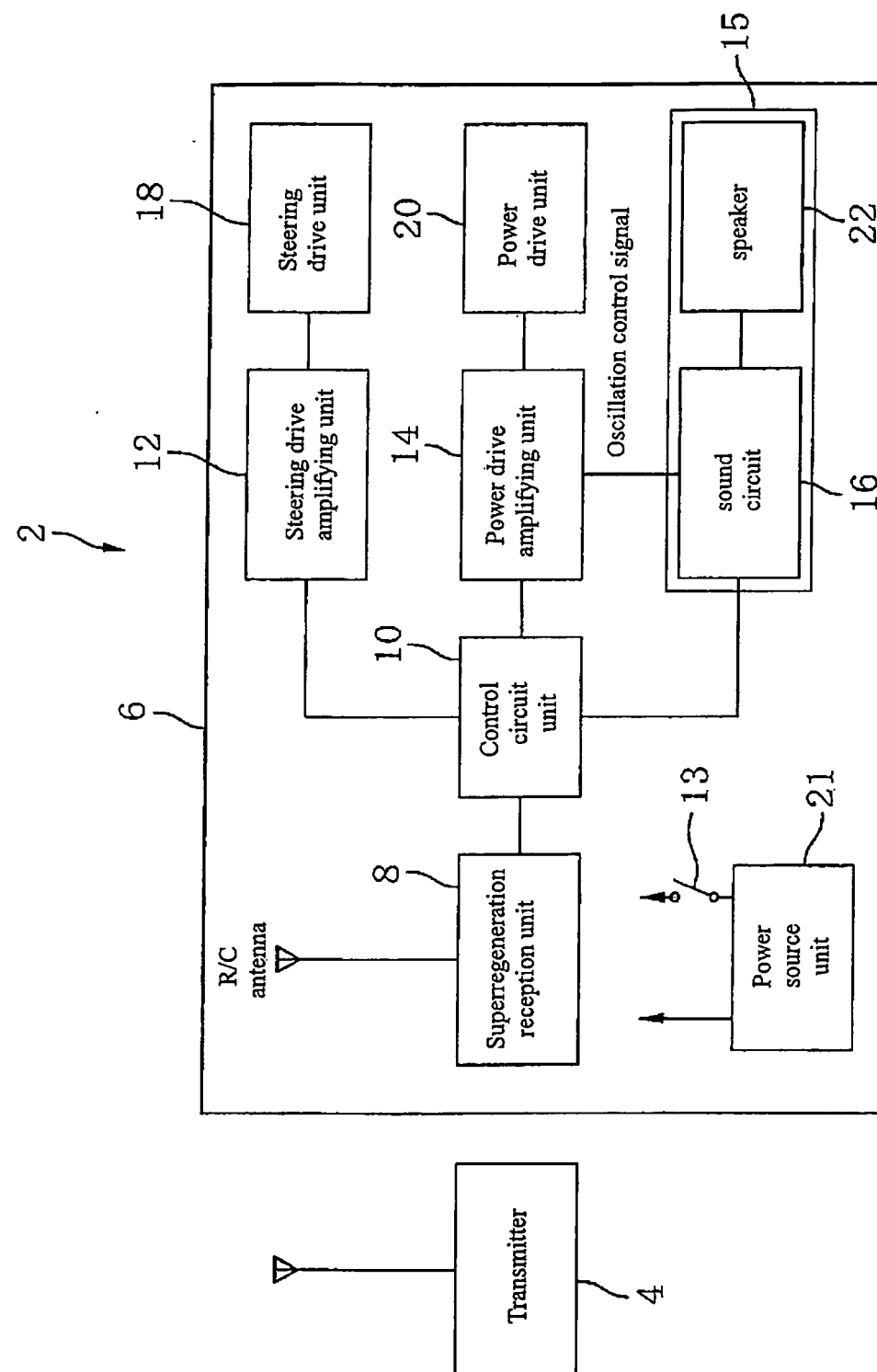


Fig. 2

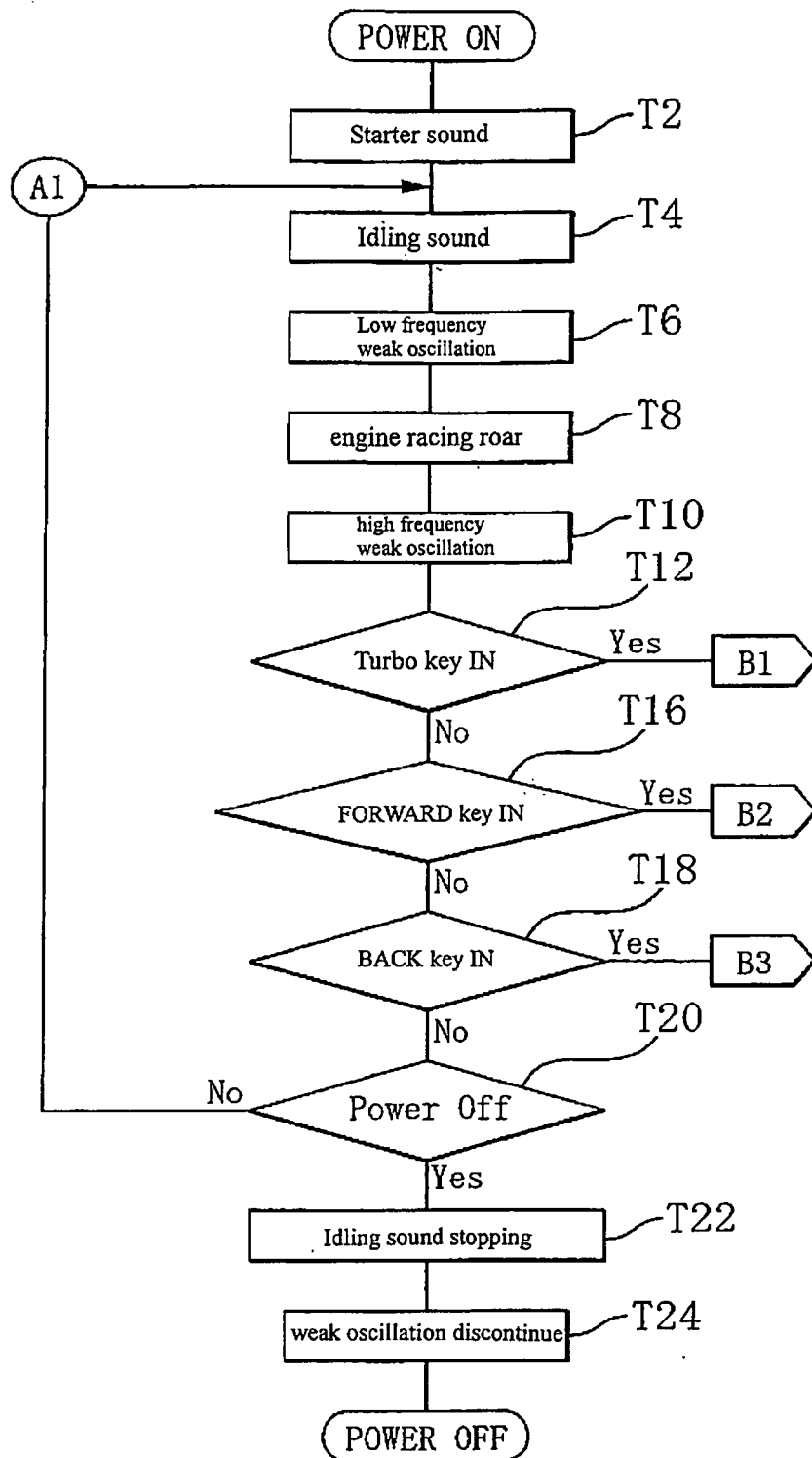


Fig. 3A

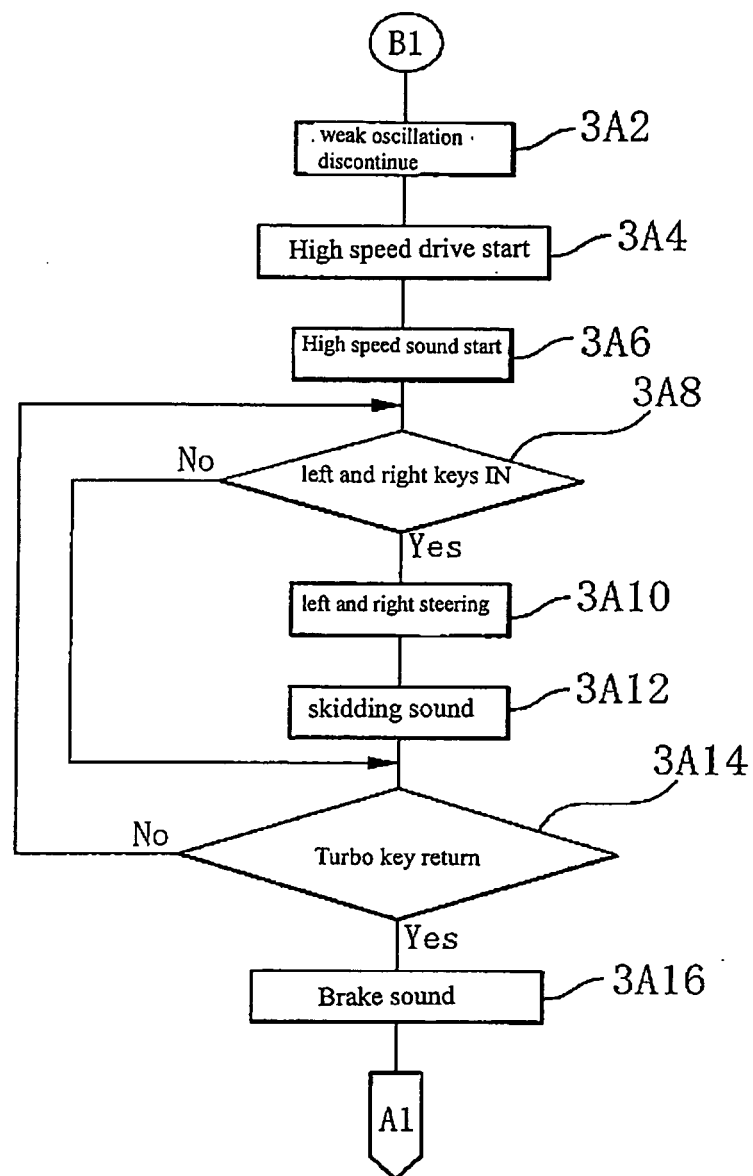


Fig. 3B

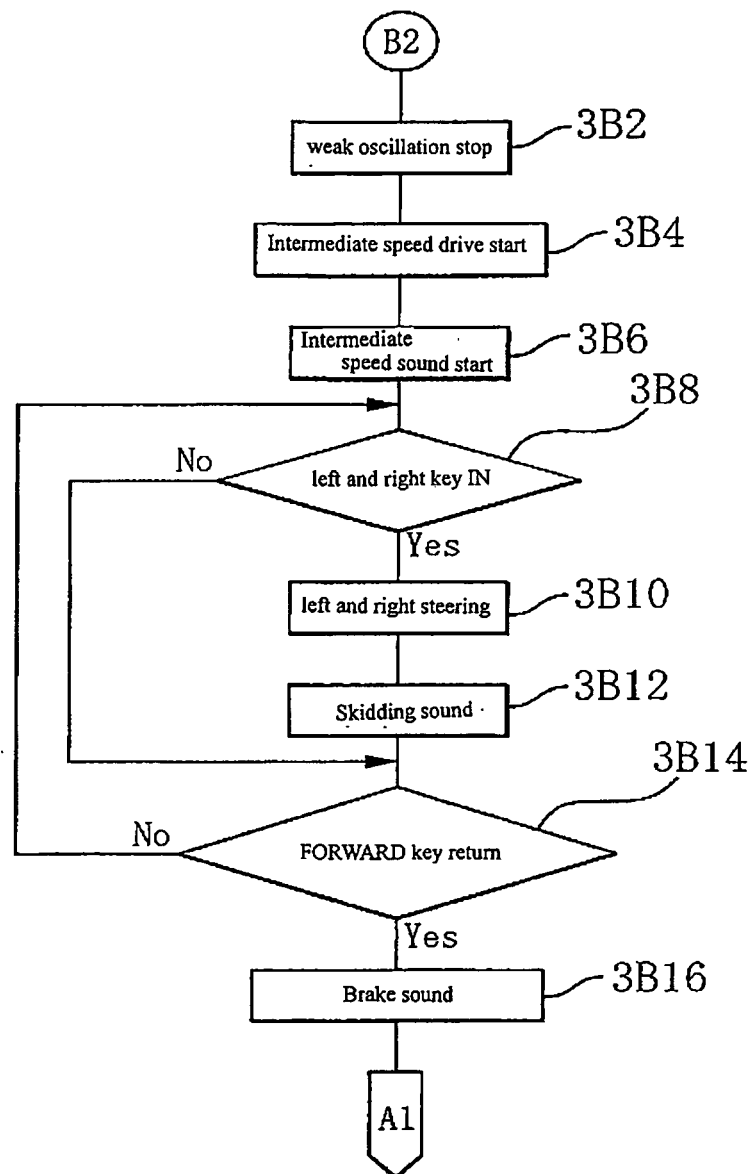


Fig. 3C

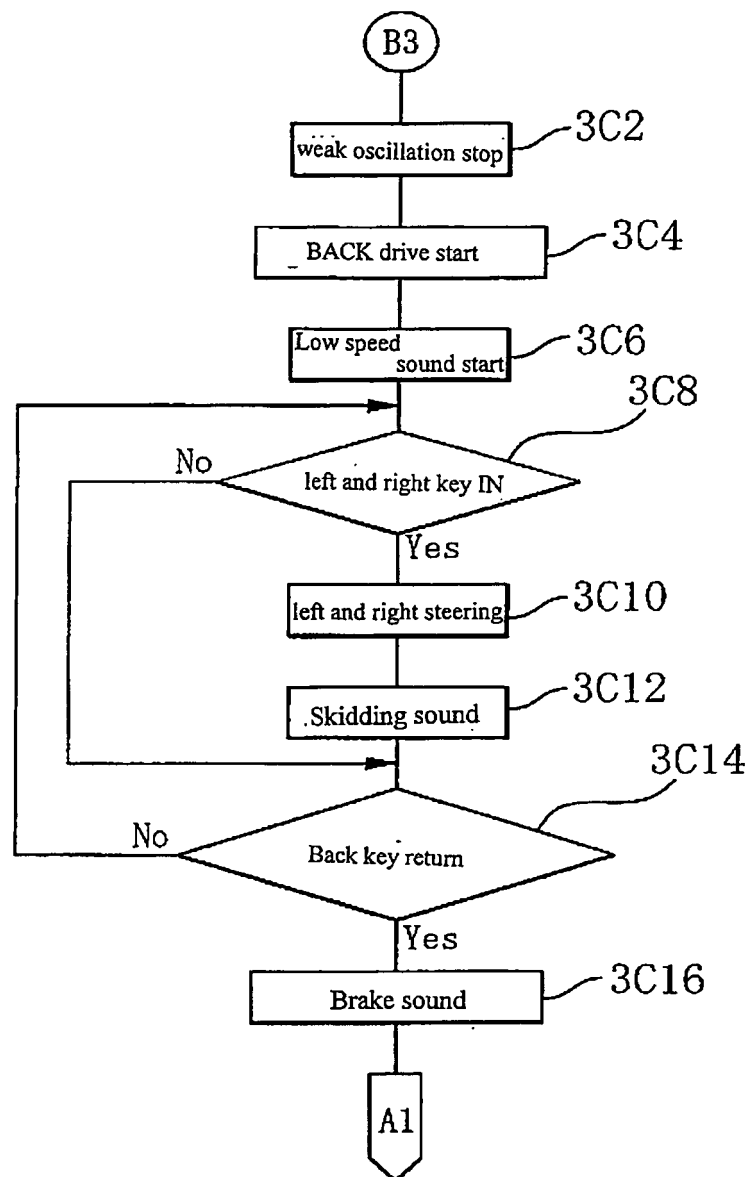


Fig. 4A

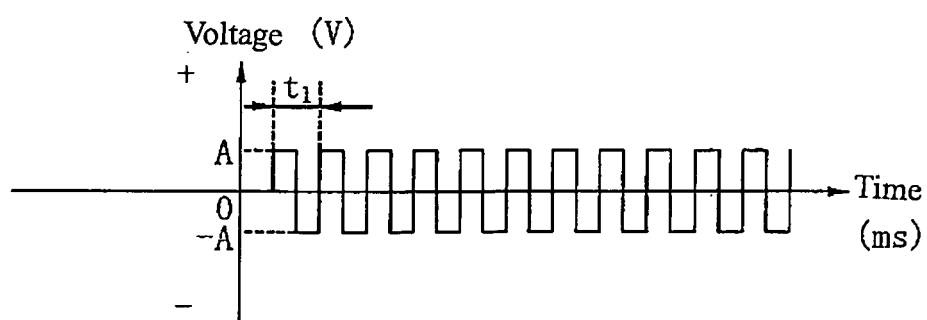


Fig. 4B

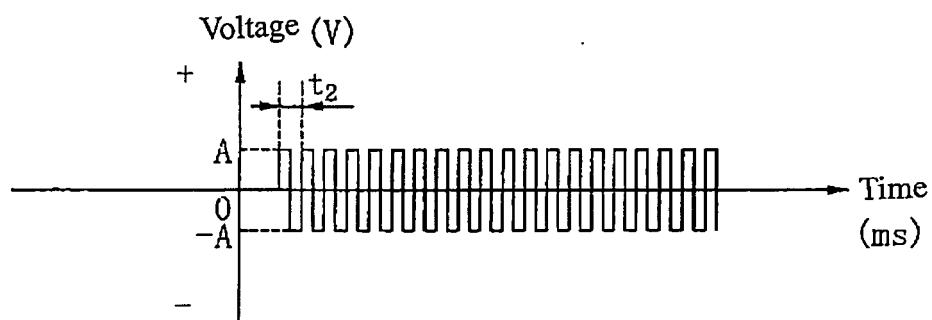


Fig. 5

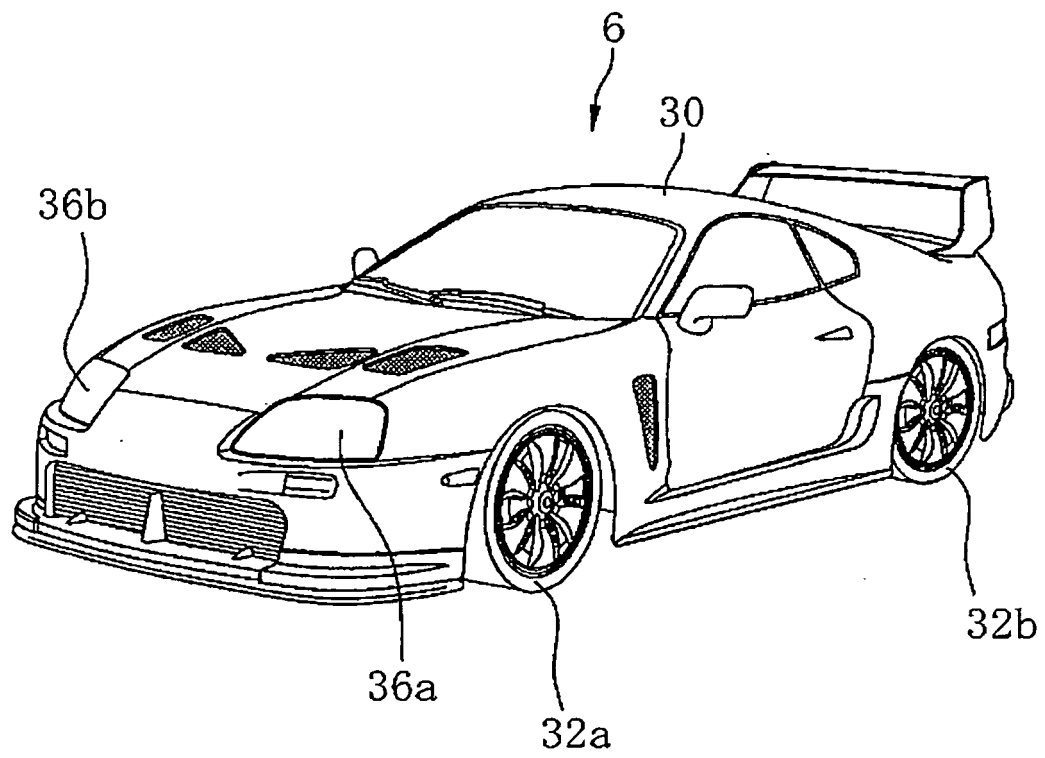


Fig. 6

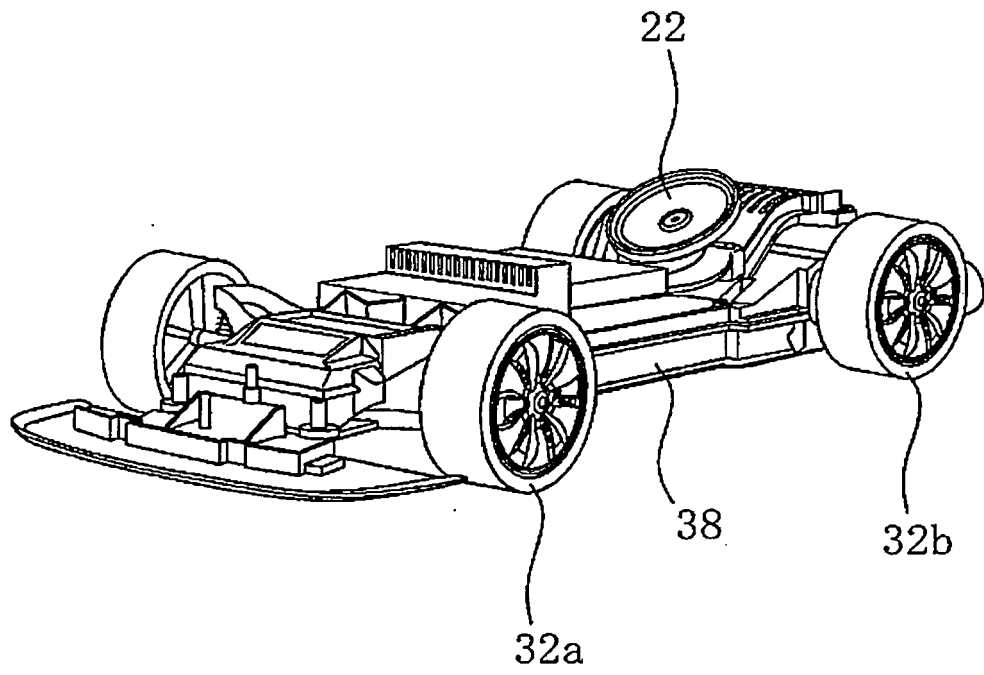


Fig. 7

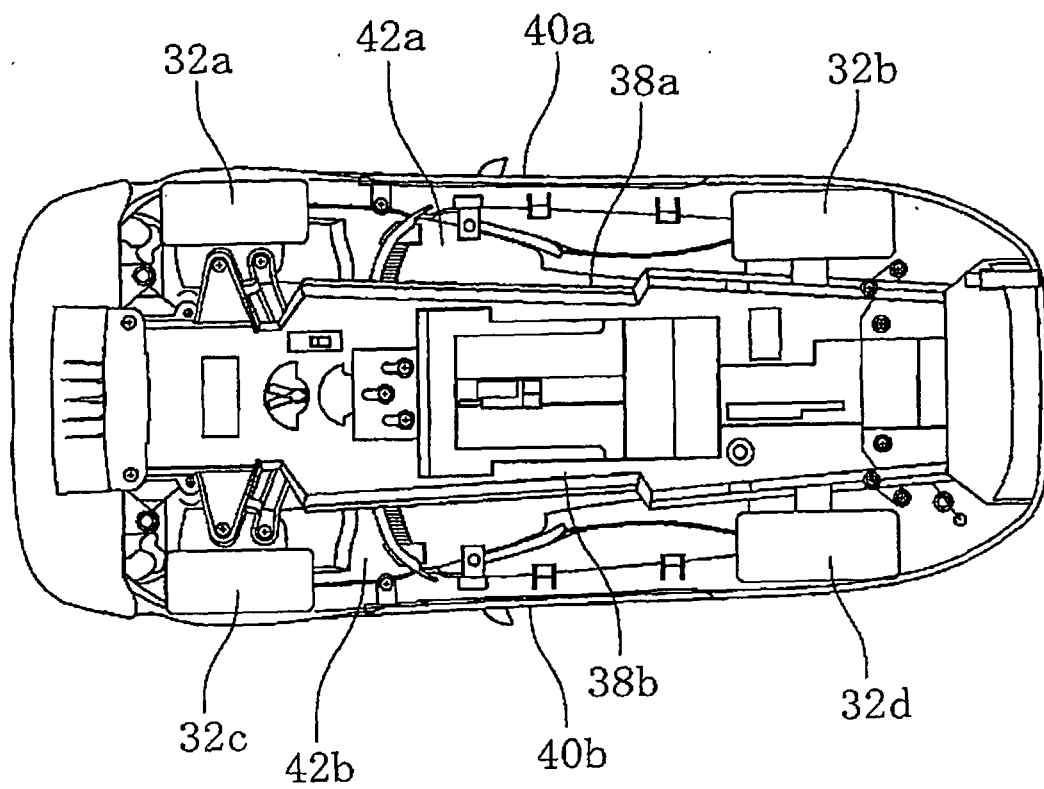


Fig. 8

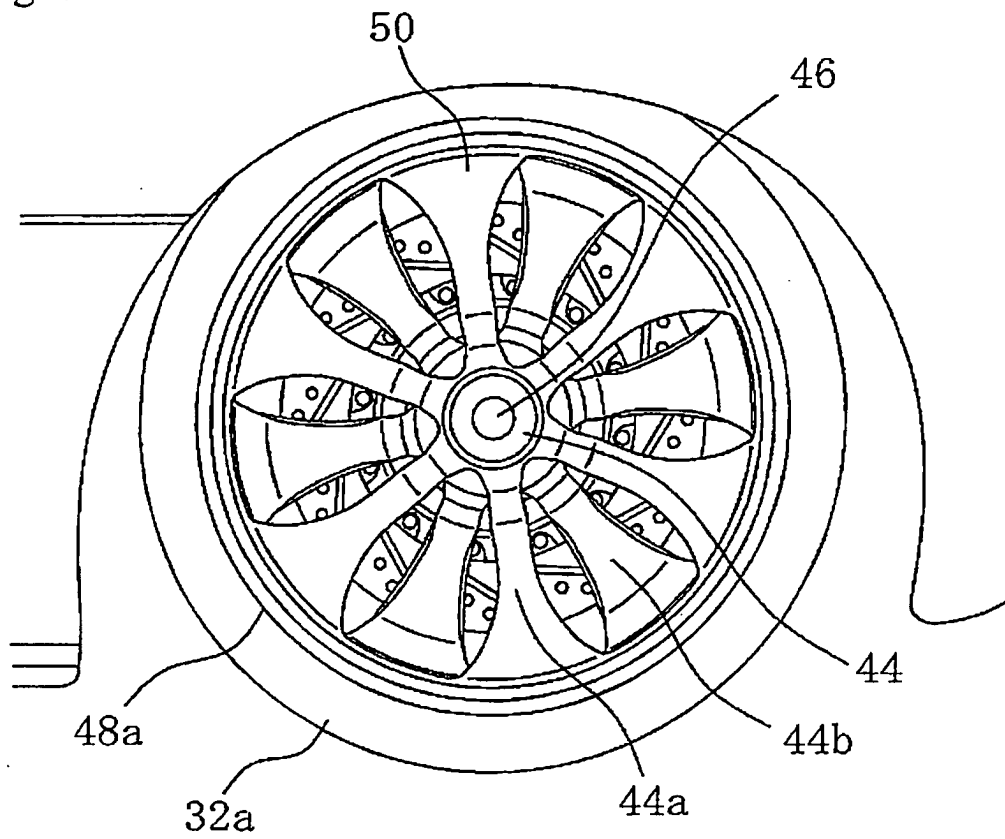
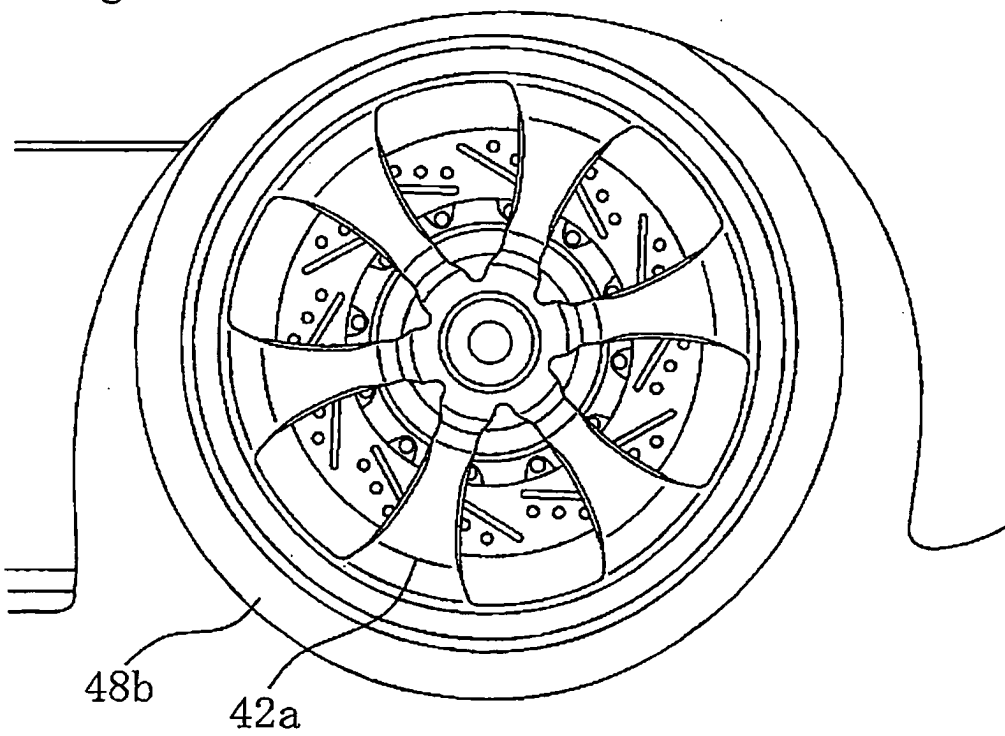


Fig. 9



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/000416

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl. ⁷ A63H17/34, A63H17/26		
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		
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 1994-2005 Kokai Jitsuyo Shinan Koho 1971-2005 Jitsuyo Shinan Toroku Koho 1996-2005		
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 A	JP 3290753 B2 (Nikko Co., Ltd.), 10 June, 2002 (10.06.02), Full text; Figs. 1 to 7 & US 5482494 A	1, 9, 11 2-3, 10, 12 4-8
Y	JP 2983572 B2 (Nikko Co., Ltd.), 29 November, 1999 (29.11.99), Full text; Figs. 1 to 5 & US 5088955 A & EP 446881 A1	2, 10, 12
Y	JP 57-30017 B2 (Mabuchi Motor Co., Ltd.), 25 June, 1982 (25.06.82), Full text; Figs. 1 to 4 & US 4258499 A & GB 2018144 A & DE 2909523 A1	3
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 01 March, 2005 (01.03.05)		Date of mailing of the international search report 22 March, 2005 (22.03.05)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (January 2004)

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Patent documents cited in the description

- JP 2983572 B [0003]