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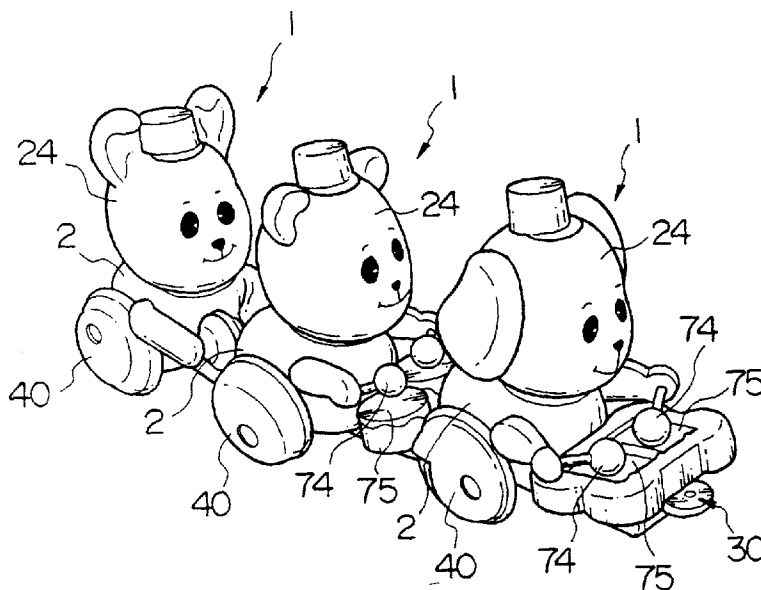
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(54) **Vehicle toy**

(57) A vehicle toy having a plurality of vehicles, which travels and plays a musical instrument such as a percussion instrument in synchronization with the traveling thereof, by pulling by the hand. Each vehicle has a doll with a striking member which is swingable; a body provided with a connecting member for connecting

the vehicle with another vehicle, at least at a front portion or a rear portion thereof; a wheel provided with a cam which rotates according to a rotation of the wheel; a lever for swinging the striking member by a rotational movement of the cam; and a member struck by the striking member to generate a sound, which is attached to the body.

FIG.1



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a vehicle toy, for example, to a vehicle toy comprising a plurality of connected vehicles, which travels by pulling by the hand and in which a doll or the like on a vehicle plays a musical instrument such as a percussion instrument and the like in synchronization with the traveling thereof.

Description of Related Art

A handcart toy generating a sound with traveling, in which when a truck provided with a handle which is arranged at an upper position of the truck, is run by pushing the handle by the hand, a cam attached to a wheel axle of the truck is rotated to swing a plurality of levers on vertical planes, which are provided in a front side of the truck, so that the top end of each lever is struck against a corresponding portion struck of the truck to generate a sound, has been known up to this time.

However, because such a handcart toy is driven by a little child grabbing the handle to push the truck, there is the possibility of the unstable handcart toy falling down while a person who cannot walk stably enough, such as a little child is at play. For a child who can walk stably enough, such a handcart toy is apt to be tired because of a little variety to make the play monotonous.

SUMMARY OF THE INVENTION

The present invention was developed in view of the above-described problems. An object of the present invention is to provide a vehicle toy which travels by pulling with the hand and the like and which has various types of play modes which can be selected at pleasure.

In accordance with one aspect of the present invention, the vehicle toy comprises at least a vehicle which travels by pulling by the hand and plays a musical instrument in synchronization with a traveling thereof, the vehicle comprising: a doll with a pair of arms each having a striking member which is swingable; a body provided with a connecting member for connecting the vehicle with another vehicle, at least at a front portion or a rear portion thereof; a wheel provided with a cam which rotates with rotation of the wheel; a lever for swinging an arm having the striking member by a rotational movement of the cam, an end of which is arranged in an engageable range with the cam and which is connected to the end of the arm to operate with the arm as a body; and a member struck by the striking member to generate a sound, which is attached to the body in an engageable range with the striking member.

In the case of only two vehicles connected to each other in the present invention, a connecting member is

required for each of the rear portion of the leading vehicle and the front portion of the following vehicle. In the case of vehicles to be connected more than two, a connecting member is required not only for each of the rear portion of the leading vehicle and the front portion of the rear vehicle but also for each of front and rear portions of the intermediate vehicles. Preferably, the member struck by the striking member is a percussion instrument.

According to the vehicle toy having such a structure, by pulling a vehicle by the hand through a string or the like, even a person who cannot walk stably enough, such as a little child can safely play. Further, it is possible not only to travel the vehicle but to play a musical instrument in synchronization with the traveling. Therefore, it is possible to make a little child or the like more pleased.

In accordance with another aspect of the present invention, the vehicle toy comprises; at least a vehicle which travels by pulling by the hand and plays a musical instrument in synchronization with a traveling thereof, the vehicle comprising: a doll with a pair of arms which are swingable; a body provided with a connecting member for connecting the vehicle with another vehicle, at least at a front portion or a rear portion thereof; a wheel provided with a cam which rotates with rotation of the wheel; a lever for swinging an arm by a rotational movement of the cam, an end of which is arranged in an engageable range with the cam and which is connected to the end of the arm to operate with the arm as a body; and a sound generating member for generating a sound by the rotational movement of the cam, which is attached to the body in an engageable range with the cam.

Preferably, the sound generating member is a bell and cymbals are attached to ends of the pair of arms. According to the vehicle toy having such a structure, because the bell is rung to generate a false sound of cymbals together with a swinging motion of the cymbal, it gives a little child or the like a little surprise and therefore makes them more happy.

The cam preferably comprises a rotary disc supported by an axle of the wheel and a pin erected on the rotary disc at an eccentric position. A plurality of pin holes for tightly fitting a plurality of pins therein may be formed in the rotary disc at eccentric positions so that the pin holes permit installation and removal of the pins.

According to the vehicle toy having such a structure, because the stroke of the lever is changed by changing the positions to fit the pins and the number of sound generation is increased by increasing the number of pins fitted, it is possible to provide a large diversity of pleasure.

Preferably, the cam is connected to the wheel through a clutch so that a connection between the cam and the wheel is released through the clutch when the cam is overloaded. The clutch may comprise a clutch disc which is arranged next to a surface of the rotary disc fixed to a wheel axle and a spring for biasing the rotary disc to push against the clutch disc, and a plurality

of projections are provided on one of the clutch and the rotary disc and a plurality of recess portions are formed in the other thereof so that these projections can fit into the recess portions. According to the vehicle toy having such a structure, because the connection between the cam and the wheel is released through the clutch when the cam is overloaded, it is possible to prevent damage of the internal mechanism by an overload.

In accordance with another aspect of the present invention, the vehicle toy comprises; at least a vehicle which travels by pulling by the hand and plays a musical instrument in synchronization with a traveling thereof, the vehicle comprising: a doll with a striking member which is swingable; a body provided with a connecting member for connecting the vehicle with another vehicle, at least at a front portion or a rear portion thereof; a wheel provided with a cam which rotates with rotation of the wheel; a lever for swinging the striking member by a rotational movement of the cam; and a member struck by the striking member to generate a sound, which is attached to the body.

Preferably, the vehicle toy comprises a plurality of vehicles which are connected to each other through the connecting member. Each of the vehicles may have a musical instrument different from each other, for example, a glockenspiel or a xylophone, a high drum, cymbals, and the like. According to the vehicle toy having such a structure, it is possible to provide a large diversity of pleasure because of generating various types of tone quality.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not intended as a definition of the limits of the present invention, and wherein:

FIG. 1 is a perspective view for showing a play mode of a vehicle toy driven by pulling by the hand, according to an embodiment of the present invention;

FIG. 2 is an exploded perspective view of a vehicle in the vehicle toy driven by pulling by the hand according to the embodiment;

FIG. 3 is a vertical sectional view for showing the linking of the wheel axle and the cam, of the vehicle of the vehicle toy driven by pulling by the hand according to the embodiment;

FIG. 4 is an elevational view of the cam which is shown in FIG. 3;

FIG. 5A is an elevational sectional view for showing a swung-up state of the striking member in the vehicle with a high drum in the vehicle toy driven by pulling by the hand according to the embodiment;

FIG. 5B is an elevational sectional view for showing a swung-down state of the striking member in the

vehicle with the high drum in the vehicle toy according to the embodiment;

FIG. 6A is an elevational sectional view for showing a state of the sound generator in a vehicle with cymbals in a vehicle toy according to an embodiment of the present invention; and

FIG. 6B is an elevational sectional view for showing another state of the sound generator in the vehicle with cymbals of the vehicle toy according to the embodiment.

PREFERRED EMBODIMENT OF THE INVENTION

Hereinafter, an embodiment of the vehicle toy according to the present invention will be explained with reference to the drawings, as follows.

FIG. 1 shows a vehicle toy which travels by pulling by the hand, which comprises three vehicles 1, 1 and 1 connected. In this embodiment, a first vehicle (leading vehicle) for playing a glockenspiel (or a xylophone), a second vehicle (intermediate vehicle) for beating a high drum, and a third vehicle (rear vehicle) for playing cymbals are connected with one another in the described order. FIG. 2 shows the second vehicle 1 for beating a high drum. The second vehicle 1 comprises a body 2 which is divided into a lower case 10 and an upper case 20, a head part 24, and a pair of wheels 40 and 40.

In the lower case 10, a pair of notches 11 and 11 are formed in both side walls and a pair of ribs 12 and 12 are erected on the inner bottom surface. In the upper end surface of each rib 12, a notch 13 is formed. In the front side surface of the lower case 10, a recess 14 is formed at a lower position and a stay 15 is tightly attached into the recess 14. A front wheel 16 is disposed on a lower portion of the top end of the stay 15 and a projection 31 for functioning as one of a connecting means 30 is formed on an upper portion of the top end thereof. On the rear portion of the lower case 10, a stay 17 is disposed at a lower position to extend backward and a recess 32 for functioning as the other of the connecting means 30 is formed in the lower surface of the top end of the stay 17. In the recess 32, a projection 31 of a connecting means 30 in another vehicle 1 can be fitted. In the side walls of the top end of the stay 15, a through hole 18 for passing a string or the like there-through is formed.

In the upper case 20, a pair of tongue pieces 21 and 21 are formed to extend downward on the lower ends of both side walls and a pair of notches 22 and 22 are formed in the lower ends of both side walls (only one side is shown in FIG. 2). On the upper surface of the upper case 20, a T-shaped projection 23 is erected. The projection 23 is for coupling the body 2 with the head part 24 having a figure of an animal or the like. The head part 24 comprises a front face portion 25 and a rear face portion 26 which have notches 25a and 26a formed in the bottom surfaces, respectively. These notches 25a and 26a form a hole when the front and rear face por-

tions 25 and 26 are brought together so that the T-shaped projection 23 can be tightly fitted in the hole, and thus the head part 24 is attached to the body 2.

The vehicle 1 is provided with a pair of wheels 40 and 40. Each a pair of wheels 40 and 40 comprises a wheel disc 41, a rubber belt 42 disposed on the periphery of the wheel disc 41, and a wheel cover 43 for covering the outer side surface of the wheel disc 41. Both wheels 40 and 40 are adhered to both ends of a wheel axle 44. The wheel axle 44 is arranged in the pair of notches 11 and 11 of the lower case 10, and thereafter when the upper case 20 is combined with the lower case 10 so as to tightly fit the top ends of the tongue pieces 21 of the upper case 20 into the notches 11 of the lower case 10, the movement of the wheel axle 44 is rotatably restricted within the notches 11 by the top ends of the tongue pieces 21.

To the wheel axle 44, a cam 50 comprising a rotary disc 51 and a plurality of pins 52 erected on the rotary disc 51, is arranged. In the rotary disc 51, a plurality of pin holes 53 for selectively setting the operation timing and the amount of swing, of levers which will be explained later, are formed. The pins 52 are tightly fitted into the pin holes 53 appropriately so that the pin holes 53 permit installation and removal of the pins 52. It is possible to generate various types of original sounds by changing the positions to fit the pins 52 therein to change the operation timing or the amount of swing, of the levers. The rotary disc 51 is arranged so that it is capable of rotation to the wheel disc 41 and of slide in an axial direction. The cam 50 is connected to the wheel axle 44 and the wheel 40 through a clutch 60. The clutch 60 comprises a clutch disc 61 which is arranged to face to a surface of the rotary disc 51 and fixed to the wheel axle 44 in a side, a stopper 62 which is fixed to the wheel axle 44 in the other side, and a coil spring 63 which is arranged between the stopper 62 and the rotary disc 51. The rotary disc 51 is pressed against the clutch disc 61 by a biasing force due to the coil spring 63. Therefore, when the clutch disc 61 is rotated by rotation of the wheel axle 44, the rotary disc 51 is rotated by a friction force between the clutch disc 61 and the rotary disc 51. If the cam 50 is overloaded, the clutch disc 61 slips on the rotary disc 51. In this embodiment, a plurality of projections 54 are provided on the surface of the rotary disc 51 and a plurality of recess portions 64 are formed in the clutch disc 61 so that these projections 54 can fit into the recess portions 64, thereby it is possible to increase the friction force between the clutch disc 61 and the rotary disc 51. It is a matter of course that the projections 54 may be provided on the surface of the clutch disc 61 and the recess portions 64 may be formed in the rotary disc 51. According to the vehicle toy having such a structure, because the connection between the cam and the wheel is released through the clutch when the cam is overloaded, it is possible to prevent damage of the internal mechanism by an overload.

In the notches 13 and 13 of the lower case 10, a

shaft 70 is fitted. When the upper case 20 is combined with the lower case 10 so as to fit the top ends of ribs which are not shown in Figures, of the upper case 20 into the notches 13, the movement of the shaft 70 is rotatably restricted within the notches 13 by the top ends of the ribs. Both ends of the shaft 70 are fitted into holes formed in base portions of a pair of levers 71 and 71. Each lever 71 has an arm 73 through a connecting rod 72 as a body and has a stick (striking member) 74 at the top end thereof. On the other hand, on the upper surface of the stay 15 supporting the front wheel 16, a boss 19 is provided. The boss 19 is tightly fitted into a through hole 75a which is formed in a portion of a high drum member (a member struck) 75.

Each lever 71 is arranged so that an end portion 71a is in the area in which it can be operated by the pins 52 of the cam 50, as shown in FIGS. 5A and 5B. Therefore, when the rotary disc 51 is rotated, the pin 52 pushes the end portion 71a of the lever 71 down, as shown in FIG. 5A. Consequently, the lever 71, the connecting rod 72, the arm 73 and the stick 74 which are constituted as a body are rotated around the shaft 70, and thereby the stick 74 is swung up. Thereafter, when the end portion 71a of the lever 71 is disengaged from the pin 52, the stick 74 falls down by its own weight and collides against the high drum 75 to generate a sound, as shown in FIG. 5B.

In the above-described embodiment, although only a vehicle for beating the high drum 75 has been explained, the above-described embodiment can be used for a vehicle for playing a glockenspiel or a xylophone by substituting a glockenspiel or a xylophone for the high drum 75.

An embodiment of a vehicle for playing cymbals is shown in FIGS. 6A and 6B. The vehicle differs from the above-explained vehicle for beating the high drum in that cymbals 76 are used in place of the stick 74 and a dummy sound generating device is added. The same reference numerals are attached to structural members, elements or the like corresponding to those of the vehicle for beating the high drum.

That is, a cymbal 76 is arranged to the top end of an arm 73 which is connected to each lever 71 as a body. On the other hand, a dummy sound generating device comprising a pair of sound generating members is swingably disposed to the lower case 10. Each sound generating member comprises a supplemental lever 77 which is swingable around an axis (which is positioned at the left end of the supplemental lever 77 in FIG. 6A) attached to the lower case 10, and a bell 78 which is hung on a supporting member mounted to the supplemental lever 77.

When the rotary disc 51 is rotated in a direction indicated by an arrow, a pin 52 pushes the end portion of the lever 71 down to swing the cymbal 76 up, as shown in FIG. 6A. Thereafter, while the lever 71 is disengaged from the pin 52 to fall the cymbal 76 down, another pin 52 pushes the end portion of the supplemental lever 77,

as shown in FIG. 6B. Consequently, the sound generating members comprising the supplemental lever 77 and the bell 78 is swung up. Thereby, the bell 78 is rung to generate a false (or dummy) sound of cymbals together with swing of the cymbal 76.

A plurality of vehicles 1, 1 and 1 each having such a structure, e.g., a first vehicle for playing a glockenspiel (or a xylophone), a second vehicle for beating a high drum, and a third vehicle for playing cymbals, are connected with one another through the connecting means 30, and thereafter a string or the like is tied to the front portion of the connecting means 30 through the hole 18 which is formed in the front portion of the lead vehicle 1. The vehicle toy comprising a plurality of vehicles 1, 1, and 1 is run by pulling the string or the like by the hand. Consequently, the rotation of the wheels 40 rotate the rotary disc 51, so that the member to be struck (percussion instrument) 75 or the bell 78, of each vehicle 1 is struck against the striking member 74 or against the supplemental lever 77, to generate a sound.

According to the vehicle toy having a structure of the above embodiment, by pulling a vehicle by the hand through a string or the like, even a person who cannot walk stably enough, such as a little child can safely play. Further, it is possible not only to travel the vehicle but to play a musical instrument in synchronization with the traveling. Therefore, it is possible to make a little child or the like more pleased. Further, according to the vehicle toy of the embodiment, because the number and the order of the vehicles having various types of musical instruments can be freely changed, it is possible to provide a large diversity of pleasure. Because the stroke of the lever can be changed by changing the positions to fit the pins and the number of sound generation can be increased by increasing the number of pins fitted, it is possible to provide a large diversity of pleasure.

Although the present invention has been explained according to the embodiment, it should be also understood that the present invention is not limited to the embodiment and that various changes and modifications may be made to the invention without departing from the gist thereof.

For example, in the above-described embodiment, although only a glockenspiel (or a xylophone), a high drum, and cymbals have been explained as musical instruments which is used for the present invention, other musical instruments, e.g., keyboard instruments such as a piano and an organ, stringed instruments such as a violin and a guitar, and the like can be also used. In the above-described embodiment, although the connection between two vehicles is performed by fitting a projection of the connecting member of one vehicle into a through hole of the connecting member of the other vehicle, it is also performed by forming through holes in the connecting members of both vehicles to insert a pin into these through holes.

As described above, according to the vehicle toy which travels by pulling a string or the like by the hand

according to the invention, it is possible to connect a plurality of vehicles with one another through a connecting means at pleasure to make a favorite marching band by animals or the like and to provide a large diversity of pleasure because of generating various types of tone quality.

Claims

1. A vehicle toy comprising at least a vehicle which travels by pulling by the hand and plays a musical instrument in synchronization with a traveling thereof, the vehicle comprising:

a doll with a pair of arms each having a striking member which is swingable;
a body provided with a connecting member for connecting the vehicle with another vehicle, at least at a front portion or a rear portion thereof;
a wheel provided with a cam which rotates according to a rotation of the wheel;
a lever for swinging an arm having the striking member by a rotational movement of the cam, an end of which is arranged in an engageable range with the cam and which is connected to the end of the arm to operate with the arm as a body; and
a member struck by the striking member to generate a sound, which is attached to the body in an engageable range with the striking member.

2. A vehicle toy as claimed in claim 1, wherein the member struck by the striking member is a percussion instrument.

3. A vehicle toy comprising at least a vehicle which travels by pulling by the hand and plays a musical instrument in synchronization with a traveling thereof, the vehicle comprising:

a doll with a pair of arms which are swingable;
a body provided with a connecting member for connecting the vehicle with another vehicle, at least at a front portion or a rear portion thereof;
a wheel provided with a cam which rotates according to a rotation of the wheel;
a lever for swinging an arm by a rotational movement of the cam, an end of which is arranged in an engageable range with the cam and which is connected to the end of the arm to operate with the arm as a body; and
a sound generating member for generating a sound by the rotational movement of the cam, which is attached to the body in an engageable range with the cam.

4. A vehicle toy as claimed in claim 3, wherein the

sound generating member is a bell and cymbals are attached to ends of the pair of arms.

5. A vehicle toy as claimed in any one of the preceding claims, wherein the cam comprises a rotary disc supported by an axle of the wheel and a pin erected on the rotary disc at an eccentric position. 5
6. A vehicle toy as claimed in claim 5, wherein a plurality of pin holes for tightly fitting a plurality of pins therein are formed in the rotary disc at eccentric positions so that the pin holes permit installation and removal of the pins. 10
7. A vehicle toy as claimed in any one of the preceding claims, wherein the cam is connected to the wheel through a clutch so that a connection between the cam and the wheel is released through the clutch when the cam is overloaded. 15
20
8. A vehicle toy as claimed in claim 7, wherein the clutch comprises a clutch disc which is arranged to face to a surface of the rotary disc fixed to a wheel axle and a spring for biasing the rotary disc to push against the clutch disc, and a plurality of projections are provided on one of the clutch and the rotary disc and a plurality of recess portions are formed in the other thereof so that these projections can fit into the recess portions. 25
30
9. A vehicle toy comprising at least a vehicle which travels by pulling by the hand and plays a musical instrument in synchronization with a traveling thereof, the vehicle comprising: 35
 - a doll with a striking member which is swingable;
 - a body provided with a connecting member for connecting the vehicle with another vehicle, at least at a front portion or a rear portion thereof; 40
 - a wheel provided with a cam which rotates according to a rotation of the wheel;
 - a lever for swinging the striking member by a rotational movement of the cam; and
 - a member struck by the striking member to generate a sound, which is attached to the body. 45
10. A vehicle toy as claimed in any one of the preceding claims, wherein the vehicle toy comprises a plurality of vehicles which are connected to each other through the connecting member. 50
11. A vehicle toy as claimed in claim 10, wherein each of the vehicles has a musical instrument different from each other. 55

FIG.1

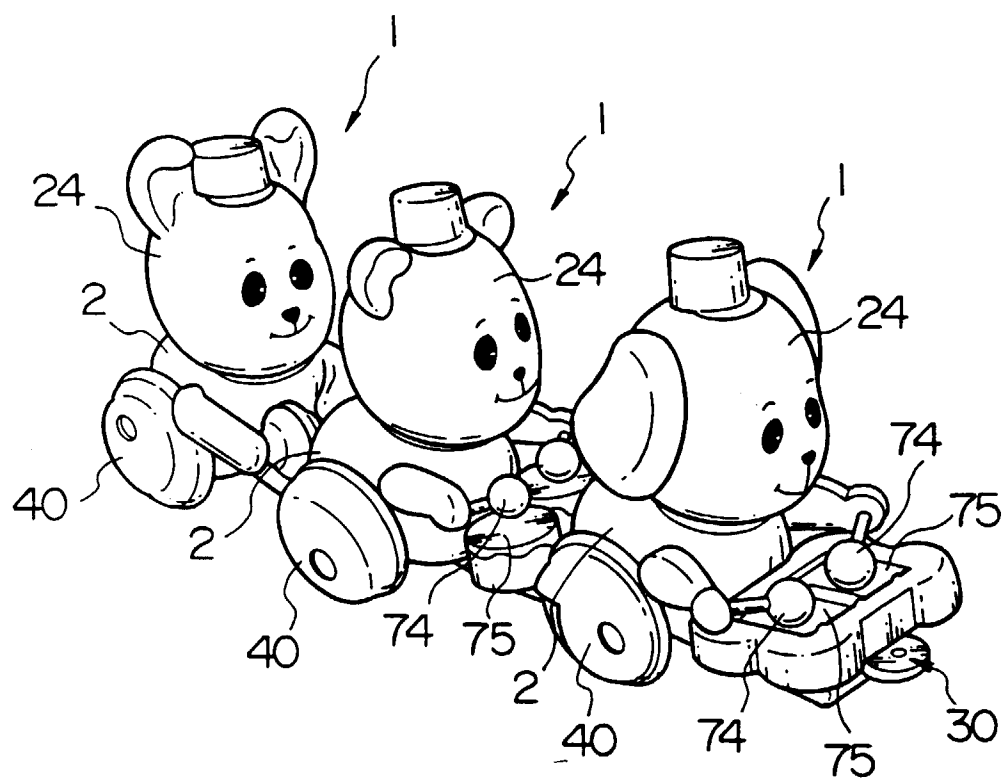


FIG.2

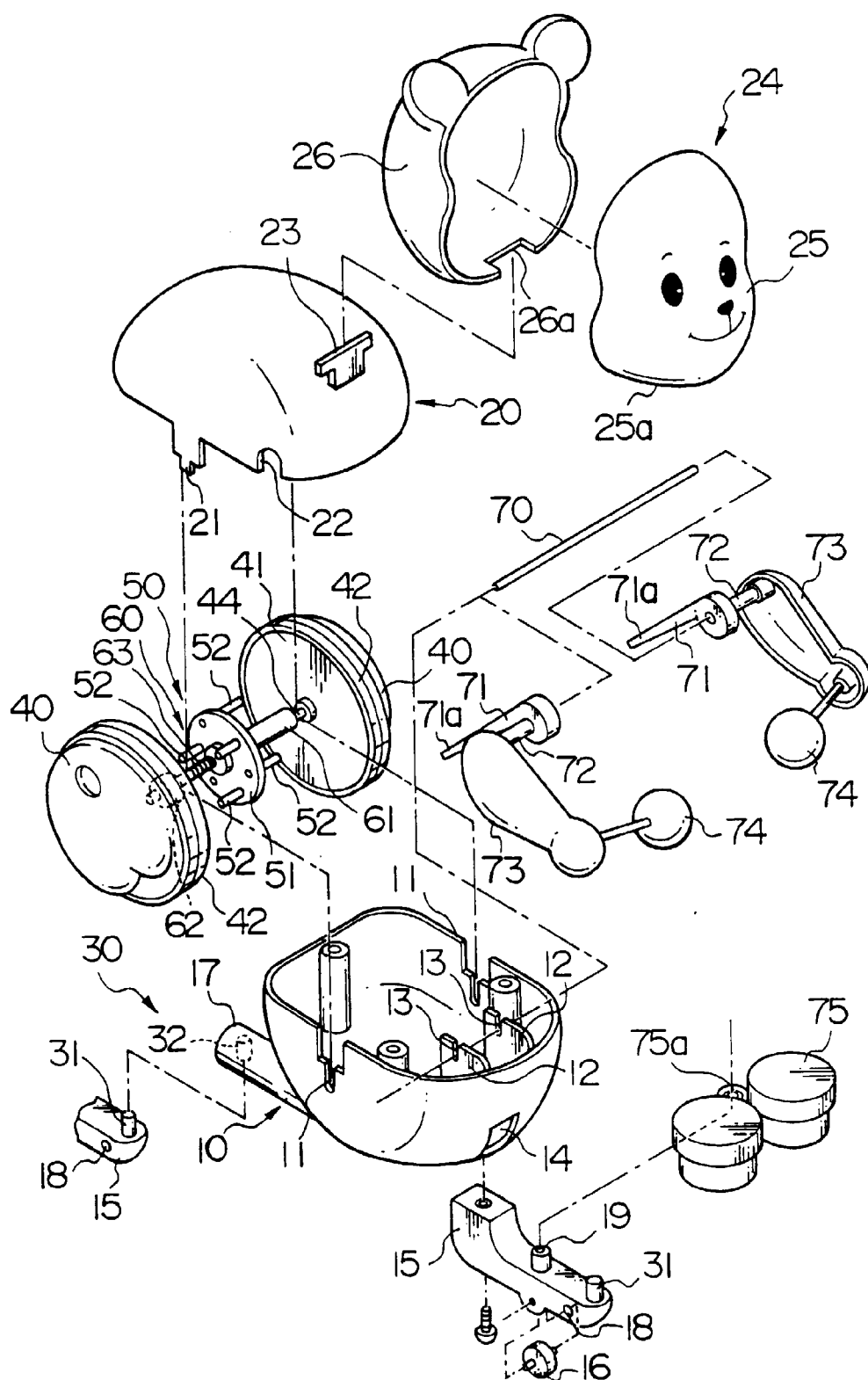


FIG.3

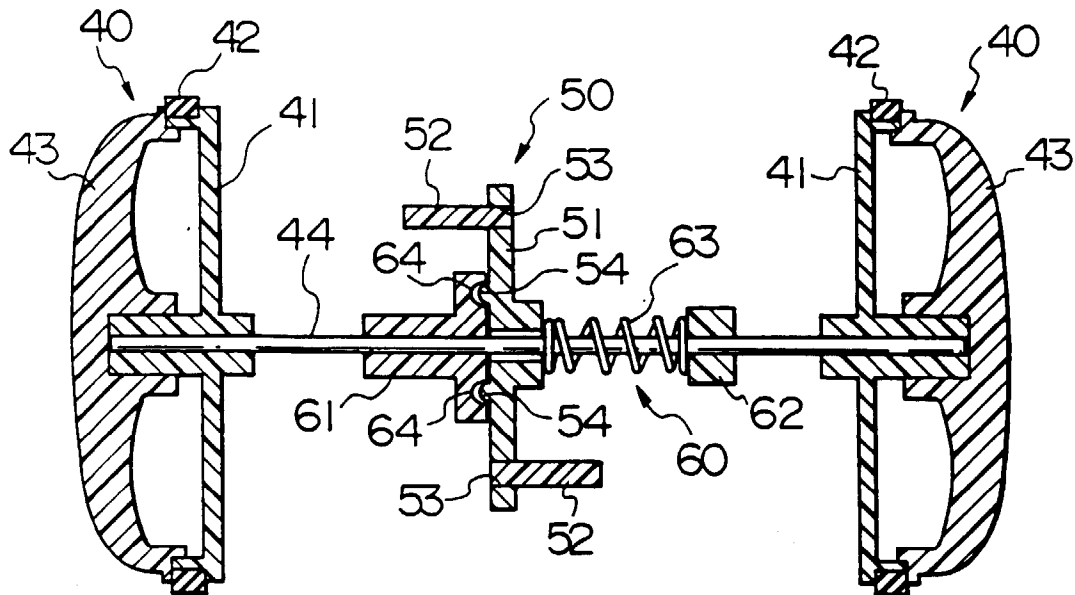


FIG.4

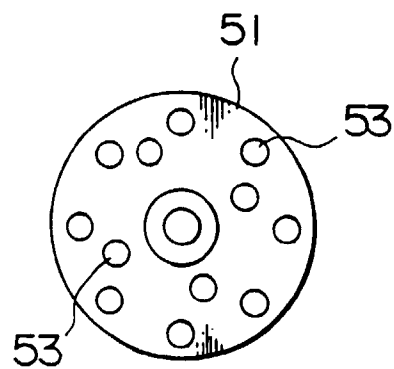


FIG.5A

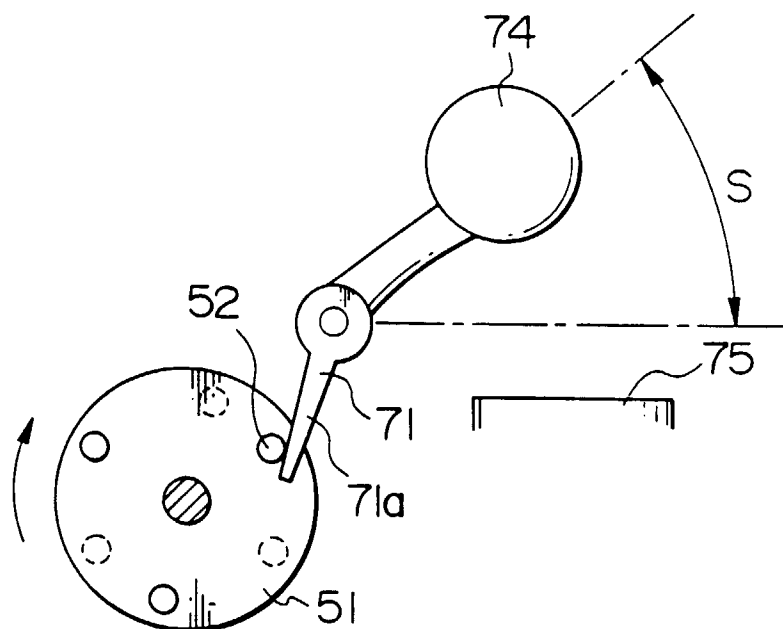


FIG.5B

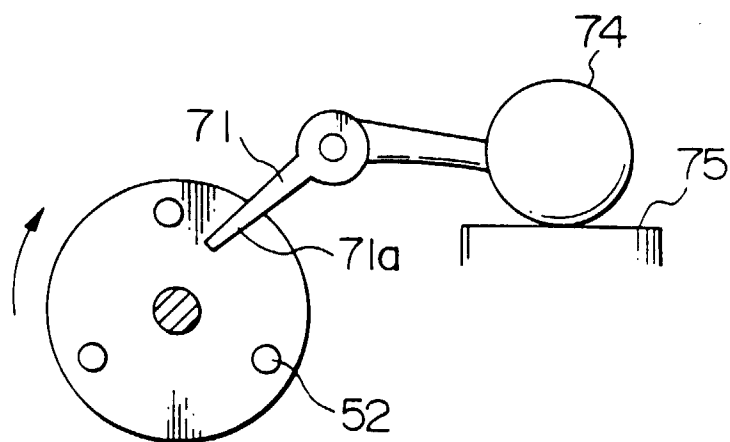


FIG.6A

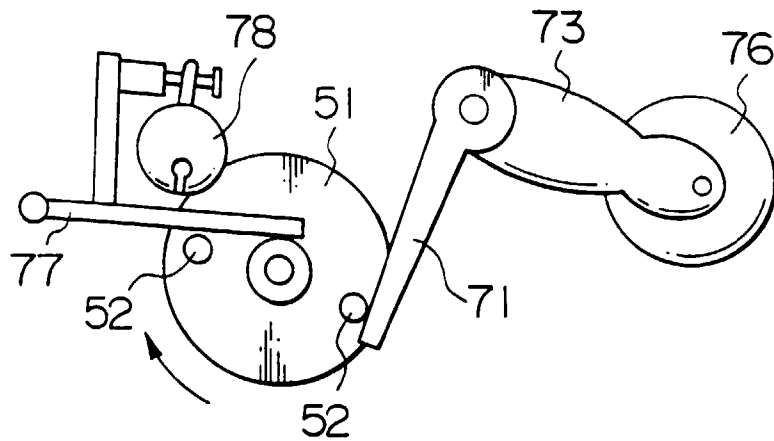
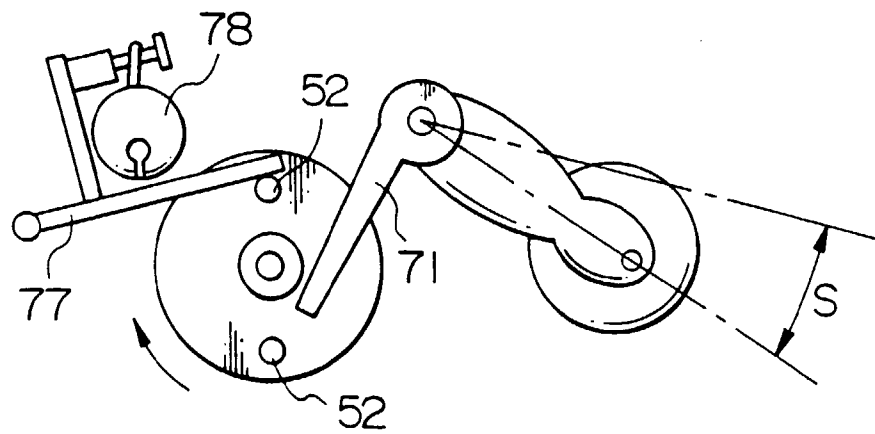


FIG.6B





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 3426

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 2 883 793 A (CRAWFORD) * figures *	1,3,9	A63H7/04
A	US 2 147 600 A (FISHER) * figures *	1,3,9	
A	US 3 750 329 A (ZBIKOWSKI) * figures *	1,3,9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A63H
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		11 August 1997	Lasson, C
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