DUMP TRUCK TOY

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ABSTRACT

Dump Truck Toy with a truck cab, a truck chassis, a truck bed, a motorized drive mechanism, a truck bed tilting mechanism, a microprocessor, a printed circuit board, a power source and a plurality of programming blocks. The blocks communicate with the microprocessor and the microprocessor gives directions to the motorized drive mechanism causing the truck toy to move in a programmed manner. A preferred embodiment includes the blocks are releasably held down in the truck bed sockets causing the switch heads to be held down thereby forcing them to interact with switch contacts on the printed printed circuit board. A preferred embodiment includes the blocks to be automatically dumped out at the end of the programmed set of truck movements.
DUMP TRUCK TOY
CROSS REFERENCE TO RELATED APPLICATIONS

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

DESCRIPTION OF ATTACHED APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] This invention relates generally to the field of toy vehicles and more specifically to a dump truck toy.

[0005] Toy trucks are well known to children around the world and are used in play where a child imagines that he or she is driving the truck and performing other imaginary truck related activities.

[0006] Toy trucks vary in level of sophistication from simple, non mechanized representations to more complex, motorized models. Some trucks have been designed to be programmable by the user. For example, Guang-Wen Lin, in his U.S. Pat. No. 4,735,593 discloses a programmable toy vehicle where the drive mechanism is directed by a lever that the child slides into various positions. Daniel Aldred et al, in his U.S. Pat. No. 6,450,856 shows a plurality of vehicles, having a plurality of pads and switches controlling and addressing any of the vehicles to give the vehicle direction. Moshe Finnmesser, in his U.S. Pat. No. 6,546,436 shows a toy vehicle where driving instructions are given by a computer via RF signal.

[0007] Although the above described patents disclose various methods of controlling a toy vehicle and may be effective, they do not allow a small child to direct a toy truck by placing directional controlling blocks into the truck bed of the toy. Furthermore, none of the above patents discloses a sequence of events that includes pressing a start button, having the toy proceed according to graphic indices located on a plurality of blocks, and finally having the truck automatically dump the blocks out at the end of the programmed driving sequence.

BRIEF SUMMARY OF THE INVENTION

[0008] The primary object of the invention is to provide a motorized dump truck toy whose direction can be easily programmed by the user.

[0009] Another object of the invention is to provide a dump truck toy whose payload consists of a plurality of blocks that have directional indices and are inserted into the truck bed to program a sequence of driving instructions. Another object of the invention is to have the truck bed tilt up at the end of the driving sequence thereby causing the blocks to dump out and initiating another round of play by the user.

[0010] Other objects and advantages of the present invention will become apparent from the following descriptions, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the present invention is disclosed.

[0011] In accordance with a preferred embodiment of the invention, there is disclosed a dump truck toy comprising: a truck cab, a truck chassis, a truck bed, a motorized drive mechanism, a truck bed tilting mechanism, a microprocessor, a printed circuit board, a power source and a plurality of programming blocks, said programming blocks including instructional means to communicate with said microprocessor and said microprocessor giving directions to said motorized drive mechanism causing said truck toy to move forward or backward in a pre-programmed manner.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The drawings constitute a part of this specification and include exemplary embodiments to the invention, which may be embodied in various forms. It is to be understood that in some instances various aspects of the invention may be shown exaggerated or enlarged to facilitate an understanding of the invention.

[0013] FIG. 1 is a perspective view of the invention.

[0014] FIG. 2 is a partial perspective view showing insertion of a block.

[0015] FIG. 3 is a side section of a block in place in the truck bed.

[0016] FIG. 4 is a side section of a block as it is released by the retaining fingers.

[0017] FIG. 5 is a perspective view of a block showing halves being turned.

[0018] FIG. 6 is a side view of the invention.

[0019] FIG. 7 is a side view of the invention with the truck bed in the dumped position.

[0020] FIG. 8 is a top view of the invention.

[0021] FIG. 9 is a rear view of the invention.

[0022] FIG. 10 is a front view of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0023] Detailed descriptions of the preferred embodiment are provided herein. It is to be understood, however, that the present invention may be embodied in various forms. Therefore, specific details disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure or manner.

[0024] Referring now to FIG. 1, we see a perspective view of the toy dump truck of the present invention 100. The truck 100 is comprised of a cab section 2 a truck bed section 2 and a rear drive section 60 as well as drive wheels 8, 9. A plurality of blocks 4 can be inserted into sockets 88. The blocks have indices in the form of graphic symbols 44 printed on each side surface. The user can program the direction of the truck 100 by the way he or she installs the blocks 4 into their respective sockets 88. The user starts the motorized drive mechanism by pressing down on the head of driver 10 causing an internal switch, not shown, to initiate the programmed driving sequence.

[0025] FIG. 2 shows a partial perspective view of the truck so that one can see into sockets 88. A plurality of switch pads 14 can be seen at the bottom of each socket 88. Additionally, the top portion of spring finger 18 can be seen in the side wall of each socket 88. Block 4 can be seen as it is about to be inserted into socket 88 as shown by dotted line 12. Block 4 has a plurality of posts 22 placed on selected surfaces of the block 4. Block 4 also has an indented portion 18 that is meant to align with spring finger 18.
FIG. 3 shows a side section view of a block 4 as defined by section line 90 shown in FIG. 8. Block 4 is inserted into socket 88. Posts 26 are pushing down on switch caps 14A, and 14C causing the electrically conductive tips of the switch caps to make contact with switch contact points 26 located on printed circuit board 24. The information regarding which switch contacts are activated is sent to a microprocessor, not shown, on the PC board 24. The microprocessor then directs a standard battery powered, standard motorized drive mechanism, not shown, to cause wheels 8, 9 to travel in the direction indicated on top of block 4. The standard drive mechanism in the present invention is found on some existing toy vehicles and is in the public domain. In this mechanism, a forward, centrally located omni-directional wheel allows the vehicle to pivot right or left as desired and turn a corner reliably. The vehicle pivots about the wheel that is not activated. Referring back to FIG. 3, Compression spring 34 forces spring fingers 18, 20 into depressions 16, 17 thereby forcing block 4 to remain in place as the block posts 22 push down on switch caps 14A, 14C.

FIG. 4 shows the same side section as shown in FIG. 3 however, motor 42 has been engaged and caused motorized 40 pinion gear 42 to turn clockwise thereby causing rack finger 36 to move left and rack finger 38 to move right causing fingers 18, 20 to disengage from depressions 16, 17. This allows the blocks to be released and to tumble out of truck bed 2 when the bed 2 is tilted up at the end of the programmed directional procedure. Rack portions 35, 45 can be extended, and arms 36, 38 can be duplicated so that a single motor 42 can cause a plurality of arms 18, 20 to engage or disengage causing all the blocks 4 in all the sockets 88 to be either locked in or released.

FIG. 5 shows a perspective view of one block 4 that shows an embodiment of a block that is comprised of two halves 4A, 4B that are centrally pinned together so that the two halves can be twisted thereby increasing the possibilities of combinations of directional indices shown in each surface of the block 4. Posts 22 engage the switch caps in sockets 88 as described above. Although the above described method of communicating directional information to the microprocessor is preferred, because of its cost effectiveness, other ways standard of communicating information can be employed such as a bar code printed on the block surface and a bar code reader mounted under socket 88. Another way to read the graphic indices on block 4 is to employ a plurality of photo diodes located under socket 88 to translate the graphical directional information. Depression 16, holding block 4 in place while in socket 88 can also be clearly seen. Additionally, graphic indices of sounds, such as the image of a horn, can are indicated by horn graphic 48. Other sounds can be indicated such as engine noises or driver comments. When the user places a block 4 into a socket with a horn graphic facing up, the horn sound is activated. The horn sound is generated by the microprocessor and emanates from a speaker, not shown, in a standard way.

To program the directional and or sound effects of the invention 100, the user places blocks 4 into each of the sockets 88 as shown in the plan view in FIG. 8. Each socket 88 is numbered 94. The user decides what direction the truck will go. For example, in the current configuration as shown in FIG. 8, by putting a block 4 in the first socket 88 as shown by the number 1, the truck will go forward for a predetermined period of time, for example five seconds. The block 4 placed in the socket 88 labeled number two shows a right turn and so the truck will turn right and travel for five seconds. The block 4 in the next number three socket shows a U turn, so the truck will make a U turn, and so forth until the sixth block is read and responded to. At the end of the sixth block, the trucks standard dumping mechanism, not shown, is activated. The standard dumping mechanism can be a cam type where the cam slidably interacts with underbody of the truck bed causing the rear portion of the truck bed to be forced up. At the same time the spring fingers 18, 20 are caused to disengage from depressions 16, 17 in all the blocks 4 so that at the apex of the dump operation the blocks are free to tumble out. The user can then start over again by inserting the blocks 4 into sockets 88 to create a new set of directions for the truck 100 and by then pushing down on the cap of the driver 10 to start the truck moving.

FIG. 6 shows a side view of the invention 100 with the truck bed 2 in the normal position.
FIG. 7 shows a side view of the invention 100 with the truck bed 2 in the tipped position so that blocks 4 can tumble out.
FIG. 8 has been discussed above.
FIG. 9 shows a rear view of the invention 100.
FIG. 10 shows a front view of the invention 100.
The above descriptions and drawings show that the dump truck of the present invention 100 provides an easy and enjoyable way for a young person to program a vehicle to move in predetermined directions. The automatic dumping feature at the end of each sequence causes the blocks to fall to the ground thereby prompting the user to reprogram the truck by putting the blocks back in the sockets in a new way.
While the invention has been described in connection with a preferred embodiment, it is not intended to limit the scope of the invention to the particular form set forth, but on the contrary, it is intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:
1. A Dump Truck Toy comprising:
a truck cab;
a truck chassis;
a truck bed;
a motorized drive mechanism;
a truck bed tilting mechanism;
a microprocessor;
a printed circuit board;
an audio speaker;
a power source and
a plurality of programming blocks;
said programming blocks including physical means to communicate with said microprocessor and
said microprocessor giving directions to said motorized drive mechanism causing said truck toy to move forward or backward in a preprogrammed manner;
2. A Dump Truck Toy as claimed in claim 1 wherein said truck bed tilting mechanism tilts up at the end of the said programmed sequence of directional events causing said blocks to dump out.
3. A Dump Truck Toy as claimed in claim 1 wherein said truck bed includes a plurality of sockets that are capable of receiving said programming blocks and where said programming blocks interact with a receiving means found on said circuit board thereby communicating directional commands to said microprocessor.
4. Dump Truck Toy as claimed in claim 1 wherein said programming blocks include a plurality of protruding posts that are capable of pressing down on corresponding switch heads located above said printed circuit board thereby communicating directional instructions to said microprocessor.

5. Dump Truck Toy as claimed in claim 1 wherein an alternate version of said interaction means between said blocks and said microprocessor includes the use of bar codes located on the surfaces of said blocks and a plurality of bar code readers located under said socket portions in the base of said truck bed.

6. Dump Truck Toy as claimed in claim 1 wherein an alternate version of said interaction means between said blocks and said microprocessor includes the use of light and dark colored graphics printed on said blocks and a plurality of photo sensors located under said socket portions in the base of said truck bed.

7. Dump Truck Toy as claimed in claim 1 wherein said motorized drive mechanism is a standard mechanism such as one that can independently drive the left rear wheel and the right rear wheel thereby allowing said truck to turn left or right or straight ahead or backward.

8. Dump Truck Toy as claimed in claim 1 wherein said truck bed tilting mechanism is a standard mechanism such as a motorized cam that interacts with the bottom surface of the truck bed thereby lifting it up and causing said blocks to dump out.

9. Dump Truck Toy as claimed in claim 1 wherein said blocks are releasably held down in said truck bed sockets causing said switch heads to be held down thereby forcing them to interact with switch contacts on said printed printed circuit board.

10. Dump Truck Toy as claimed in claim 9 wherein said blocks include at least one depression located on the side of each said block and where a spring biased finger assembly mounted within said truck bed can engage said depressed area causing said block to remain forced down against the bottom of said truck bed socket, and said finger capable of being electro-mechanically released from said depression at the end of the set of said programmed driving events thereby allowing said blocks to tumble out of said truck bed when said truck bed is tilted up fully.

11. Dump Truck Toy as claimed in claim 1 wherein the start of said programmed driving events is triggered by the user pressing down on the head of a driver located in said truck cab thereby activating an electrical switch connected to said printed circuit board.

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