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Terzian

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[54] **MOTOR OPERATED TOY VEHICLE**

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[52] **U.S. Cl.** **46/206**

[51] **Int. Cl.** **A63h 17/00**

[58] **Field of Search** ..... 46/201, 202, 221, 46/100, 206, 243 LV; 180/29, 30–35

[56] **References Cited**

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[57] **ABSTRACT**

A toy vehicle which is capable of mobility on a solid surface or through a liquid medium, and which is possessed of self-righting capability, characterized by the provision of forward and rear driven spherical wheels and an intermediate body between the wheels having a low center of gravity with a power source for the vehicle and motor means held in sealed compartments within the body.

9 Claims, 5 Drawing Figures

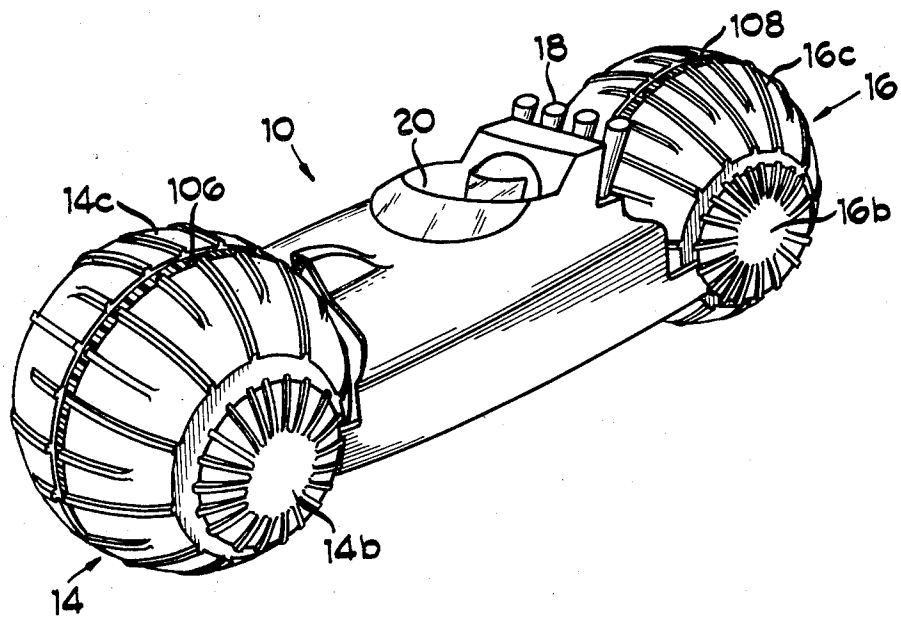
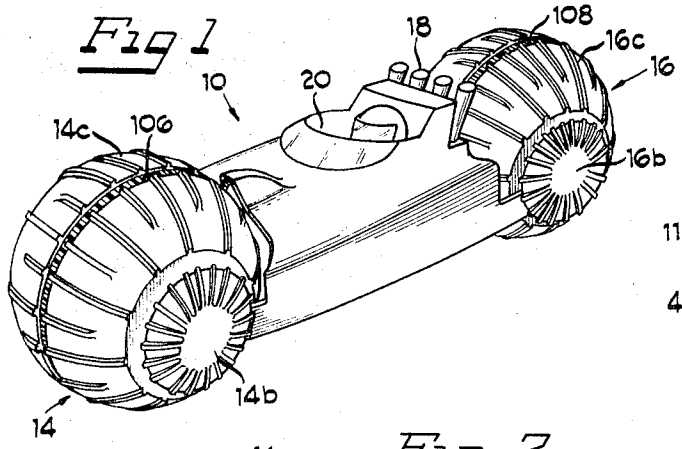


Fig 1



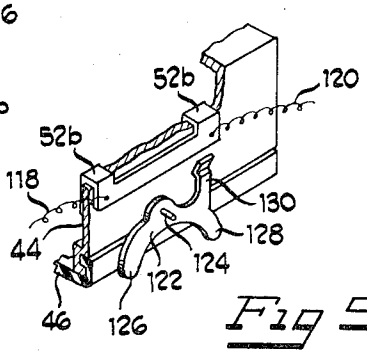
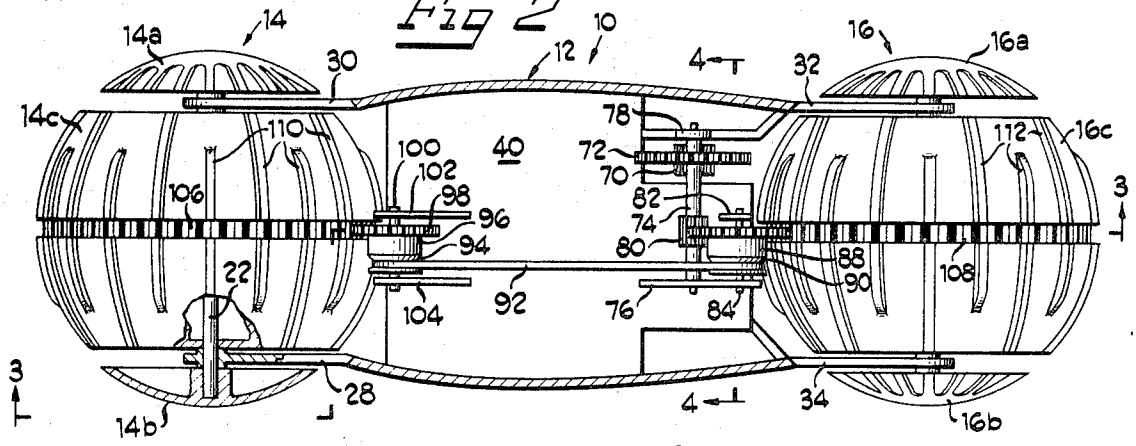


Fig 5

Fig 2



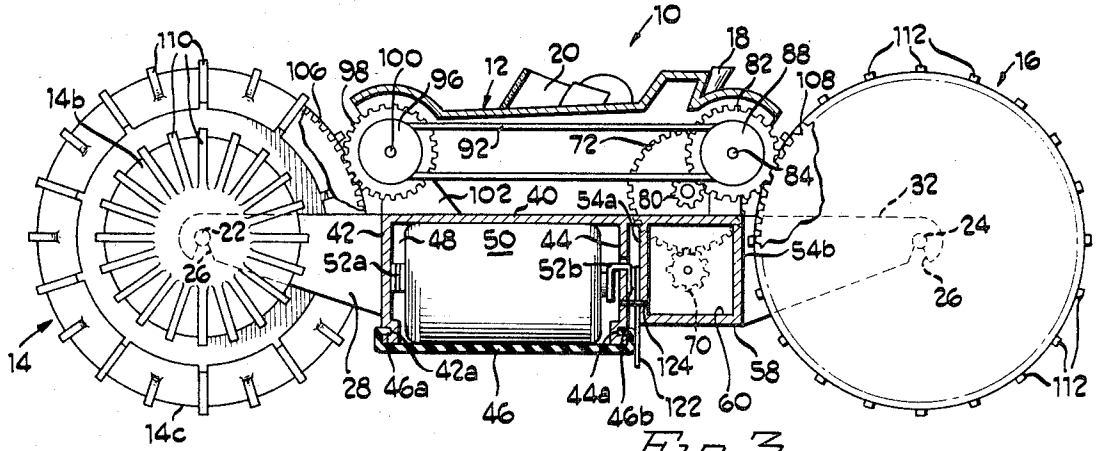


Fig 3

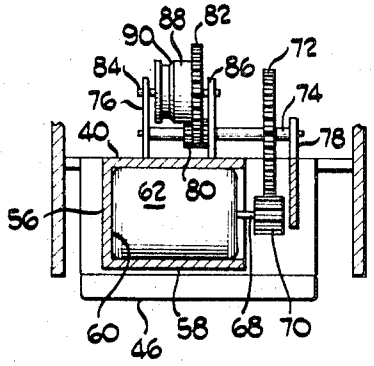


Fig 4

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MOTOR OPERATED TOY VEHICLE

BACKGROUND OF THE INVENTION

This invention relates to toys, and more particularly to a novel toy vehicle.

BRIEF DESCRIPTION OF THE PRIOR ART

Many forms of driven toy vehicles have been developed, and generally speaking, they are popular in that the user may easily associate himself as the guiding source for the vehicle. Some vehicles have so-called "trick" characteristics, while other seem to be realistic duplicates of original automobiles or trucks.

Children are particularly fascinated with toy vehicles which are capable of performing in a manner beyond the capabilities of conventional vehicles. Accordingly, it is the object of this invention to meet the continuing need and desire in the art, for the provision of an improved toy vehicle of this type.

SUMMARY OF THE INVENTION

This invention is directed, in brief, to the provision of an improved toy vehicle capable of performing in an unconventional manner.

The best mode currently contemplated for carrying out the invention includes the provision of a vehicle body with power and motor components therein, preferably held in a liquid impervious chamber, and a power train associated with the motor. The body supports front and rear, hollow, substantially spherical wheels, which are driven by the power train. Preferably, the motor and power compartments are at, and below, the axis of rotation of the wheels to give the vehicle a low center of gravity. Also, preferably, no part of the body projects beyond the perimeter of the wheels, thereby facilitating the self-righting characteristics of the vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the toy vehicle of this invention;

FIG. 2 is a horizontal section view through the vehicle shown in FIG. 1;

FIG. 3 is a partial vertical section view taken generally along the line 3—3 of FIG. 2;

FIG. 4 is a section view taken generally along the line 4—4 of FIG. 2; and

FIG. 5 is a fragmentary perspective view of the switch means for actuating the vehicle.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a specific embodiment therefor, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

The toy vehicle **10** of this invention includes a body, generally designated **12**, and forward wheel **14** and rear wheel **16**, each of which are substantially identical. The body **12** includes an outer decorative shell, and inner supporting webs for supporting functional components. The decor on the body **12** may include a simulated exhaust stack **18** and driver compartment **20**.

Each wheel **14** and **16** is basically a hollow sphere formed in three parts, such as the end cap portions **14***a*, **14***b*; and **16***a* and **16***b*; and the hollow enclosed central spherical segmental portions **14***c* and **16***c*, respectively. An axle **22** and **24** is provided for each of the front and rear wheels, respectively, and the axle joins the three portions of the wheels together as a unit, but slightly spaced apart. The axles are rotatably received in an axle-receiving opening **26** in each of the axle supporting extensions **28, 30, 32** and **34** of the body **12** to rotatably connect the wheels with respect to the body **12.**

The interior of the body **12** is provided with an intermediate panel **40** which extends thereacross, for supporting some of the components of the vehicle. Webs or walls **42** and **44** depend from the panel **40** and are provided with outwardly facing notches **42***a* and **44***a* for receiving inwardly facing flanges **46***a* and **46***b* of a bottom closure panel **46.** Walls **42** and **44** and panel **46,** together with the remainder of the body shell **12** define a battery receiving compartment **48** for receiving batteries **50** to be utilized as a source of power for the vehicle. It is intended that the closure panel **46** and its connection with the walls **42** and **44** would be such as to form a liquid-tight seal, so that water or the like would not enter into compartment **48.** The battery compartment **48** includes the usual spring **52***a* and opposite contacts **52***b*, between which the batteries **50** are to be interposed.

Also, depending from panel **40** are a pair of side walls **54***a* and **54***b* and end walls **56,** enclosed by bottom **58,** to define a sealed motor chamber **60.** Motor **62** is held within chamber **60** and has the usual rotatably driven output shaft **68** and motor shaft gear **70** thereon. Motor shaft gear **70** is in meshing engagement with gear **72,** mounted on shaft **74,** which is rotatably journalled between upright webs **76** and **78** associated with the body panel **40.** Shaft **74** also supports a reduced gear **80** which is in meshing engagement with a rear wheel drive gear **82,** connected to a shaft **84** which is rotatably mounted between an upright **86** connected to panel **40** and the aforementioned upright **76.**

Gear **82** includes a hub extension **88** having a recess **90** therein for receiving a drive belt or band **92.** Belt **92** is also received in a recess **94** of hub **96** associated with front wheel drive gear **98,** connected with shaft **100** which is rotatably journalled between upright **102** and **104** connected to the panel **40.** Each of the front and rear wheels **14** and **16** has an annular recessed gear surface **106** and **108** respectively, generally medially positioned in the portions **14***c* and **16***c* with which the gears **98** and **82,** respectively, are in meshing engagement. By this arrangement, both of the front and rear wheels are driven responsive to actuation of the motor **62** through the aforedescribed gear and belt train. It is contemplated that ribs or fins **110** and **112** would be formed on the wheels **14** and **16** for providing a source of traction of the vehicle on solid surfaces, such as floors or dirt or the like, as well as, surfaces for driving the vehicle through liquid mediums, such as water or the like.

The toy vehicle is provided with a switch means **116** for activating the motor. Switch means **116** includes the lead wires **118** and **120** and a switch member **122** which is pivoted to post **124** between walls **44** and **54***a*. Switch **122** has switch arms **126** and **128** and switch leg **130.** When arm **128** is depressed, the leg **130** will be brought into contact with the contacts **52***b* to close the

circuit and thereby supply power to the motor to activate the same to drive the vehicle.

In operation, the vehicle may be placed on a relatively solid surface, or in water, and the motor activated to drive the vehicle across or through the medium. In the case of a liquid medium, such as water, the hollow middle portions **14***c* and **16***c* of each wheel gives sufficient buoyancy to the vehicle to permit the same to float, and the ribs on the wheels will displace water as the wheels are driven to propell the vehicle through the water. In the case of traversal over a relatively solid surface, the ribs give sufficient traction to propell the wheels across the surface. The low center of gravity afforded by the low mounting of the battery and motor relative to the axis of rotation of the wheels tends to cause the vehicle to "right" itself when the vehicle is either placed on its side, or after striking an abutment which causes it to fall from the upright position. The fact that no portion of the body of the vehicle protrudes beyond the periphery of the wheels, assists in facilitating this "self-righting" characteristic. It has been found that even when the vehicle is upside down, eventually the vehicle will have a tendancy to turn itself right side up, due to both the wheel configuration and the location of the relative center of gravity. If the vehicle is directed towards a generally upright intersecting surface it will merely traverse across the intersecting surface following engagement therewith, rather than being stopped in its path of travel. Thus, it can be seen that the toy vehicle of this invention is capable of providing an extreme amount of fascination to children who may utilize it to play in different mediums, such as ground or floors or in water, as well as causing it to engage obstacles which the vehicle may encounter in its path of travel.

The vehicle is capable of traversing several different types of terrain, such as sand, gravel, solid surfaces and so forth in addition to its ability to propel itself through water with the aid of the ribs **110.** When engaging a vertical intersecting surface, the combination of the ribs and spherical wheels cause the vehicle to turn away from frontal engagement with the surface and travel along the surface or away therefrom. When engaging a corner formed by intersecting vertical surfaces, the vehicle also is able to work itself away from the confines of the corner and move away therefrom or along one of the surfaces as the spherical ribbed wheels gradually work the vehicle away from such confinement.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as some modifications may be obvious to those skilled in the art.

I claim:

1. A toy vehicle comprising: means defining a vehicle body having a top, bottom, opposite sides and opposite ends; a pair of generally spherical driving wheels rotatably connected to each end of the body for supporting the body relative to a supporting surface, each of said wheels having an outer perimeter which projects beyond the top and bottom and opposite sides of the body; and power means connected with the vehicle and in driving engagement with at least one of said wheels to rotate the same and propel the vehicle along a supporting surface whereby at least some portion of said wheels will be in engagement with a supporting surface, or surfaces transverse thereto, to continually drive said vehicle.

2. The toy vehicle of claim **1** wherein said power means includes a driving gear on the body and peripheral gear surfaces on at least one of the wheels.

3. The toy vehicle of claim **1** wherein each of said spherical wheels has an axle affording an axis of rotation and wherein said power means is substantially below the axis of rotation of each of the wheels to provide a substantially low center of gravity for the wheel.

4. The toy vehicle of claim **1** wherein said power means includes a motor and a storage battery casing on the vehicle body.

5. The toy vehicle of claim **1** wherein said body is provided with axle supporting extensions from each side thereof with each of said extensions receiving the axle of each of said spherical wheels within the perimeter of said wheels.

6. The toy vehicle of claim **1** wherein said wheels are formed in closely spaced apart segments joined together by an axle and said body has extensions extending into the space between said segments for rotatably supporting said axle.

7. The toy vehicle of claim **1** wherein said power means includes a motor and a source of power for the motor on the vehicle, both said motor and source of power being substantially located below the axis of rotation of the wheels to provide a low center of gravity to the vehicle.

8. The toy vehicle of claim **1** wherein two wheels are provided at opposite ends of the body, with driving gears on the body in engagement with each of the peripheral gear surfaces on each wheel.

9. The toy vehicle of claim **8** wherein said wheels are formed in closely spaced apart segments joined together by an axle and said body has extensions extending into the space between said segments for rotatably supporting siad axle.

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