REMOTE CONTROLLED MODEL VEHICLE

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Abstract

A model vehicle is disclosed wherein a front portion or a rear portion of a chassis may be selectively raised and lowered, the vehicle also capable of being driven and steered using a remote transmitter.
REMOTE CONTROLLED MODEL VEHICLE
CROSS-REFERENCE TO RELATED APPLICATION


FIELD OF THE INVENTION

[0002] The invention relates to a model vehicle and more particularly to a model vehicle wherein a front or rear of a chassis may be selectively raised and lowered, and driven and steered using a remote control.

BACKGROUND OF THE INVENTION

[0003] The prior art includes model cars and other similar vehicle replicas having wheels which may be driven or the bodies may be selectively raised and lowered under the control of a manually actuated electric motor. Vehicles of the above referred type are of considerable interest to children from ages of five years and up.

[0004] It is desirable to produce a model vehicle which can be selectively driven forwardly and rearwardly; steered; and raised or lowered in respect of the wheels and supporting surface by remote control.

SUMMARY OF THE INVENTION

[0005] According to the present invention, a model vehicle which can be selectively driven forwardly and rearwardly; steered; and raised or lowered in respect of the wheels and supporting surface by remote control has surprisingly been discovered.

[0006] In one embodiment, the model vehicle comprises a chassis; a pivoting member pivotally mounted to the chassis; a first set of ground engaging wheels attached to the pivoting member; means for imparting a pivotal movement of the pivoting member in respect of the chassis to cause a raising and lowering of at least a portion of the chassis; means for moving the first set of wheels about respective vertical axes to effect a steering of the vehicle; a second set of ground engaging wheels mounted to the chassis in spaced relation from the first set of wheels; and means for moving the second set of wheels about a respective horizontal axis to cause a driving motion of the vehicle.

[0007] In another embodiment, the model vehicle comprises a chassis; a pivoting member pivotally mounted to the chassis; a first set of ground engaging wheels attached to the pivoting member; means for imparting a pivotal movement of the pivoting member in respect of the chassis to cause a raising and lowering of at least a portion of the chassis; means for rotating the first set of wheels about respective vertical axes to effect a steering of the vehicle; a second set of ground engaging wheels mounted to the chassis in spaced relation from the first set of wheels; means for rotating the second set of wheels about a respective horizontal axis to cause a driving motion of the vehicle; and a controller for selectively controlling the means for imparting a pivotal movement, the means for rotating the first set of wheels; and the means for rotating the second set of wheels.

[0008] In another embodiment, the model vehicle comprises a chassis; a yoke pivotally mounted to the chassis and having a pair of spaced apart arms and a cross-piece interconnecting the arms; at least one ground engaging wheel attached to the arms of the yoke; a first electric drive motor for imparting a pivotal movement of the yoke in respect of the chassis to cause a raising and lowering of at least a portion of the chassis; a second electric drive motor for rotating the at least one ground engaging wheel about a vertical axis to effect a steering of the vehicle; at least one ground engaging wheel mounted to the chassis in spaced relation from the at least one ground engaging wheel attached to the arms of the yoke, said at least one ground engaging wheel mounted to the chassis including a third electric drive motor to cause a rotation thereof about a horizontal axis to cause a driving motion of the vehicle; a source of electrical energy for the electric drive motors; and a remote transmitter for transmitting signals to effect selective energization of the electric drive motors.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The above, as well as other advantages of the present invention, will become readily apparent to those skilled in the art from the following detailed description of a preferred embodiment when considered in the light of the accompanying drawings in which:

[0010] FIG. 1 is an exploded side elevational view of a model vehicle incorporating the features of the present invention;

[0011] FIG. 2 is a side elevational view of the chassis of the model vehicle illustrated in FIG. 1 with portions broken-away to more clearly illustrate the structure with the front of the associated chassis in a lifted or elevated position;

[0012] FIG. 3 is a top plan view of the chassis of the model vehicle illustrated in FIG. 2 with portions broken-away for clarity;

[0013] FIG. 4 is a fragmentary top plan view of the chassis illustrated in FIG. 3 with the wheels of the vehicle turned to steer the motion of the vehicle in a clockwise direction;

[0014] FIG. 5 is an exploded perspective view of the chassis assembly with elements removed to illustrate the various components thereof;

[0015] FIG. 6 is an exploded perspective view of still another view of the chassis assembly illustrated in FIG. 5; and

[0016] FIG. 7 is a perspective view of a remote transmitter for controlling the operation of the vehicle illustrated in FIGS. 1-6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0017] The following detailed description and appended drawings describe and illustrate various exemplary embodiments of the invention. The description and drawings serve to enable one skilled in the art to make and use the invention, and are not intended to limit the scope of the invention in any manner.

[0018] Referring to the drawings, there is illustrated a model vehicle incorporating the features of the invention including a mechanism for effecting the forward and rear-
ward motion of the vehicle; a steering motion of the front wheels; and a hopping action of the front portion of the vehicle.

[0020] The body assembly 12 includes a body shell 30, which may be a replica of an existing well-known vehicle, and a chassis 32 formed to replicate the frame, suspension system and certain other features of the running gear. The body shell 30 and the chassis 32 may be typically formed of any suitable material such as a plastic material molded to genuinely represent the commercial vehicle. The plastic components may be glued together and/or assembled by suitable threaded fasteners.

[0021] The suspension of the vehicle 10 is comprised of a front axle assembly and a rear axle assembly. The front axle assembly includes a yoke or pivoting member 34. The yoke 34 has a pair of spaced apart arms 36, 36' pivotally mounted at pivots 38, 38' to the chassis 32. The outermost ends of the arms 36, 36' are interconnected by a cross-piece 40 as specifically illustrated in FIG. 4. The outermost ends of the arms 36, 36' pivotally receive the front wheel axle assemblies 42, 42' respectively. The front wheel axle assemblies 42, 42' include the ground engaging wheels 14, 14', respectively. A tie rod 44 pivotally interconnects the front wheel axle assemblies 42, 42'. The tie rod 44 includes a depending pair of spaced apart camming surfaces 46, 46' which face each other. The space between the camming surfaces 46, 46' receives a cam member 48 affixed to a drive shaft of the first electric drive motor 20.

[0022] The drive motor 20 is reversible to effect selective steering of the front wheels 14, 14' through the respective axle assemblies 42, 42'. It will be noted that pivotal movement of the front wheel assemblies is brought about by the rotation of the camming member 48 within the space between the surfaces 46, 46' causing the tie rod 44 to move in one or the other direction. The tie bar 44 is constantly biased to the center point by a pair of spring biased arms 50, 50'. The arms 50, 50' are biased to urge the steering wheels 14, 14' to steer the vehicle along a straight path.

[0023] The innermost end of the arm 36 of the yoke 34 is provided with an inverted camming surface 52 adapted to be contacted by a cam member 54 affixed to the drive shaft of the second electric drive motor 22. Rotation of the cam member 54 will cause the yoke 34 to pivot about the pivots 38, 38' to effect an up and down hopping motion of the front of the body shell 32 in respect of the front wheels 14, 14', as clearly illustrated in FIG. 2.

[0024] A rear axle assembly rotatably supports to the rear of the chassis 32 and includes a rear axle 58, rear ground engaging wheels 16, 16', the third electric drive motor 24, and a gear train 64 interconnecting the drive motor 24 to the wheels 16, 16'.

[0025] The source of electrical energy 18 is provided and typically includes batteries with sufficient energy to cause the energization of the electric drive motors 20, 22, and 24 through suitable electrical conductors. The electric drive motors 20, 22, and 24 are selectively energized through integral receivers upon receiving an energizing signal from a remote transmitter 70 as illustrated in FIG. 7.

[0026] FIG. 7 illustrates the transmitter 70 which includes switches 72, 74, and 76 to effect drive motions, steering, and hopping motion, respectively, for the vehicle body assembly 12. An on/off switch 78 is provided to actuate or inactivate the system.

[0027] The invention is more easily comprehended by reference to specific embodiments recited hereinabove which are representative of the invention. It must be understood, however, that the specific embodiments are provided only for the purpose of illustration, and that the invention may be practiced otherwise than as specifically illustrated without departing from its spirit and scope.

What is claimed is:
1. A model vehicle comprising:
   a chassis;
   a pivoting member pivotally mounted to said chassis;
   a first set of ground engaging wheels attached to said pivoting member;
   means for imparting a pivotal movement of said pivoting member in respect of said chassis to cause a raising and lowering of at least a portion of said chassis;
   means for moving said first set of wheels about respective vertical axes to effect a steering of the vehicle;
   a second set of ground engaging wheels mounted to said chassis in spaced relation from said first set of wheels; and
   means for moving said second set of wheels about a respective horizontal axis to cause a driving motion of the vehicle.
2. The vehicle according to claim 1, further comprising a source of electrical energy.
3. The vehicle according to claim 2, further comprising a controller for selectively controlling said means for imparting a pivotal movement, said means for moving said first set of wheels, and said means for moving said second set of wheels.
4. The vehicle according to claim 3, wherein said controller is a wireless remote transmitter.
5. The vehicle according to claim 1, wherein said pivoting member is a yoke.
6. The vehicle according to claim 5, wherein the yoke includes a pair of spaced apart arms.
7. The vehicle according to claim 6, wherein said first set of ground engaging wheels are mounted to respected ones of the arms of the yoke.
8. The vehicle according to claim 7, further comprising a cam surface disposed on the yoke.
9. The vehicle according to claim 2, wherein said means for imparting a pivotal movement includes a first electric drive motor.
10. The vehicle according to claim 9, wherein said pivoting member is a yoke having a cam surface disposed
thereon, the first electric drive motor operably engaging the cam surface of the yoke to cause pivotal movement of the yoke.

11. The vehicle according to claim 2, wherein said means for moving said first set of wheels includes a second electric drive motor.

12. The vehicle according to claim 2, wherein said means for moving said second set of wheels includes a third electric drive motor.

13. A remote controlled model vehicle comprising:
   a chassis;
   a pivoting member pivotally mounted to said chassis;
   a first set of ground engaging wheels attached to said pivoting member;
   means for imparting a pivotal movement of said pivoting member in respect of said chassis to cause a raising and lowering of at least a portion of said chassis;
   means for rotating said first set of wheels about respective vertical axes to effect a steering of the vehicle;
   a second set of ground engaging wheels mounted to said chassis in spaced relation from said first set of wheels;
   means for rotating said second set of wheels about a respective horizontal axis to cause a driving motion of the vehicle; and
   a controller for selectively controlling said means for imparting a pivotal movement, said means for rotating said first set of wheels, and said means for rotating said second set of wheels.

14. The vehicle according to claim 13, wherein said controller is a wireless transmitter.

15. The vehicle according to claim 13, further comprising a source of electrical energy.

16. The vehicle according to claim 13, wherein said pivoting member is a yoke including a pair of spaced apart arms and a cam surface, wherein said first set of ground engaging wheels are mounted to respected ones of the arms of the yoke.

17. The vehicle according to claim 16, wherein said means for imparting a pivotal movement includes a first electric drive motor operably engaging the cam surface of the yoke to cause pivotal movement of the yoke.

18. The vehicle according to claim 13, wherein said means for rotating said first set of wheels includes a second electric drive motor.

19. The vehicle according to claim 13, wherein said means for rotating said second set of wheels includes a third electric drive motor.

20. A remote controlled model vehicle comprising:
   a chassis;
   a yoke pivotally mounted to said chassis and having a pair of spaced apart arms and a cross-piece interconnecting the arms;
   at least one ground engaging wheel attached to the arms of said yoke;
   a first electric drive motor for imparting a pivotal movement of said yoke in respect of said chassis to cause a raising and lowering of at least a portion of said chassis;
   a second electric drive motor for rotating said at least one ground engaging wheel about a vertical axis to effect a steering of the vehicle;
   at least one ground engaging wheel mounted to said chassis in spaced relation from said at least one ground engaging wheel attached to the arms of said yoke, said at least one ground engaging wheel mounted to said chassis including a third electric drive motor to cause a rotation thereof about a horizontal axis to cause a driving motion of the vehicle;
   a source of electrical energy for said electric drive motors; and
   a remote transmitter for transmitting signals to effect selective energization of said electric drive motors.

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