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Sullivan

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[54] **RACING CAR AND CHASSIS THEREFOR**

[75] Inventor: **Matthew A. Sullivan,** Willow Grove, Pa.

[73] Assignee: **Sullivan Products Inc.,** Willow Grove, Pa.

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 157,561, June 28, 1971.

[52] **U.S. Cl.** ..... **280/106.5 R,** 46/221, 46/243 LV, 46/244 B, 267/160

[51] **Int. Cl.** **A63h 17/26**

[58] **Field of Search** ..... 280/106.5 R; 46/206, 46/221, 222, 223, 243 LV, 243 D, 244 R, 244 B; 267/160, 158

[56] **References Cited**

UNITED STATES PATENTS

2,253,217	8/1941	Wenthe	280/106.5 R X
3,520,080	7/1970	Fairbairn	46/223 X

FOREIGN PATENTS OR APPLICATIONS

1,040,369	8/1966	Great Britain	46/221
1,022,798	3/1966	Great Britain	46/221
982,195	2/1965	Great Britain	46/221
761,648	11/1956	Great Britain	267/160
1,272,043	8/1961	France	

Primary Examiner—Benjamin Hersh
Attorney—Seidel et al.

[57] **ABSTRACT**

A radio control racing car having a resilient suspension system which is adjustable is provided. The wheels of the car are permitted to flex substantially independently of each other with a positive control provided for the amount of flexibility of each wheel.

10 Claims, 4 Drawing Figures

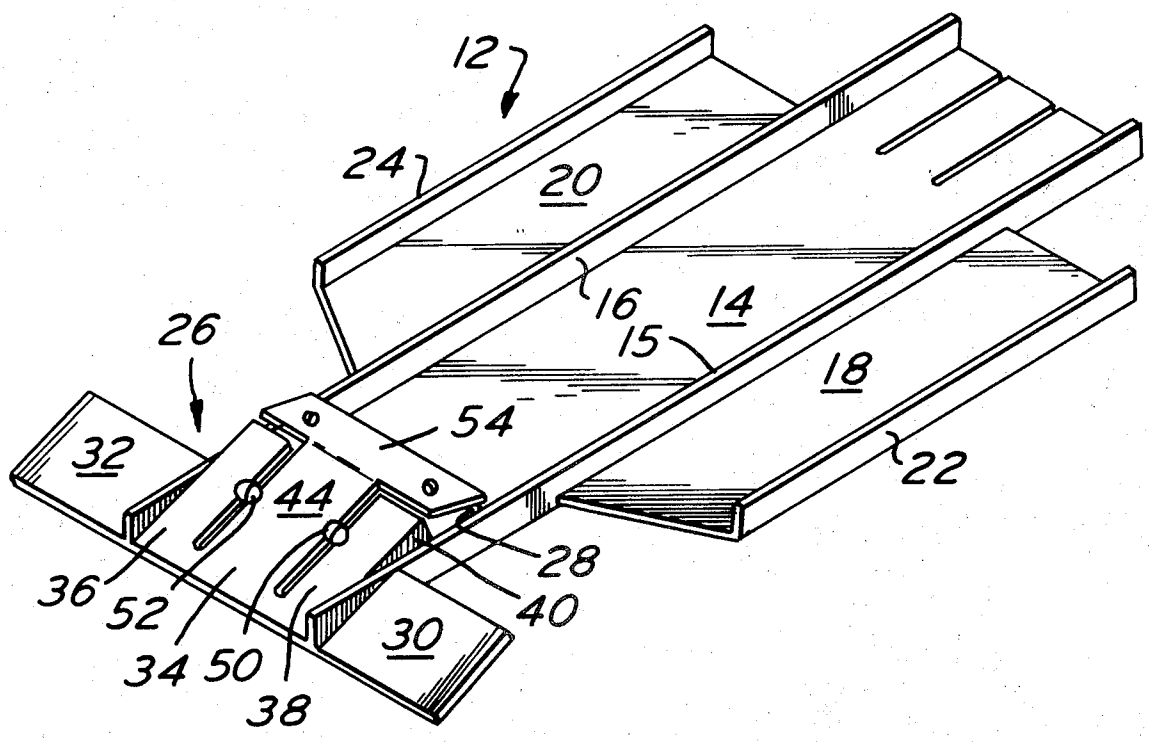
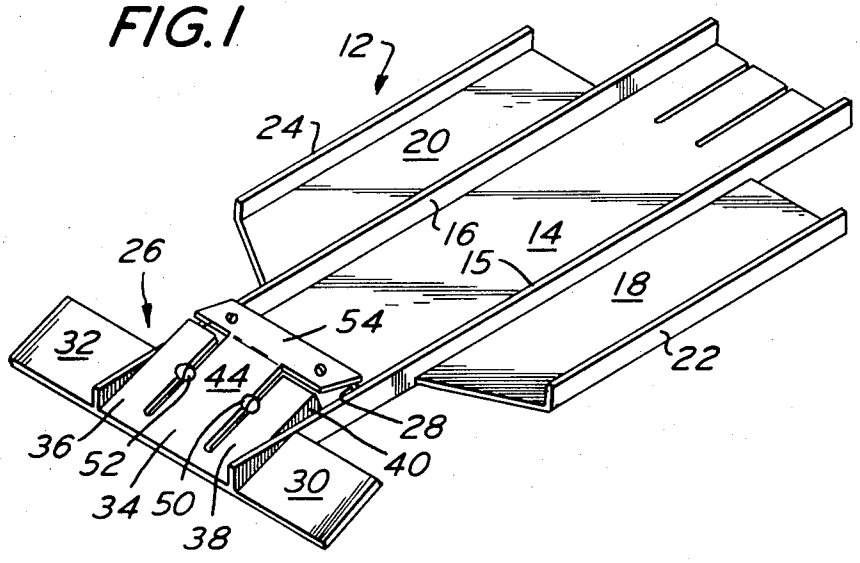


FIG. 1



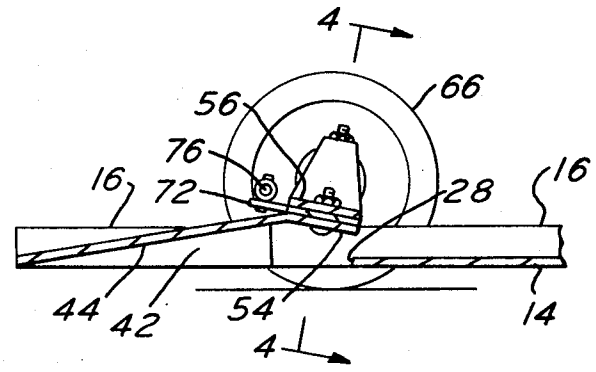


FIG. 3

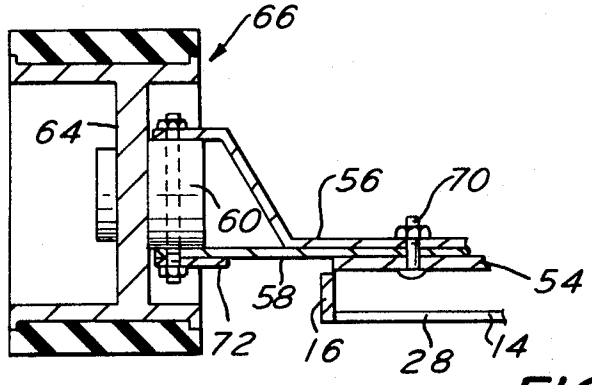
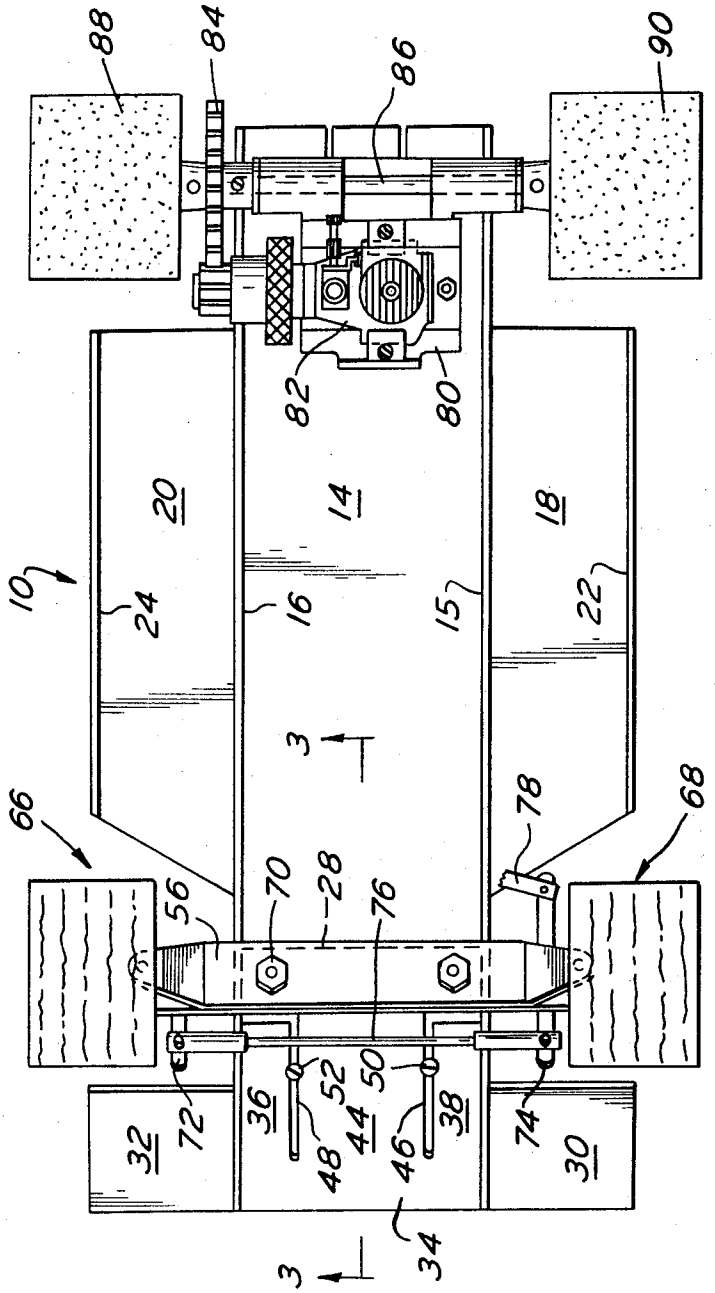


FIG. 4

FIG. 2


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3

RACING CAR AND CHASSIS THEREFOR

This application is a continuation-in-part of my copending application Ser. No. 157,561 filed June 28, 1971 and entitled RACING CAR.

The present invention relates generally to a radio control racing car and more specifically to a radio control racing car having an adjustable flexible suspension system and a motor mount for positively clamping the motor into its desired operative position.

Radio control racing cars are becoming increasingly popular. The cars are usually manufactured on a one-eighth scale wherein 1½ inches is equal to 1 foot. There are numerous problems in the design of such cars which may be operated at speeds well in excess of 35 miles per hour.

Due to the small size of the cars and the high speeds which the cars attain, problems have arisen with respect to the suspension systems thereof and the means for accurately and positively clamping the motor therein.

In general, manufacturers of radio control racing cars have provided maximum rigidity for the chassis of such cars. Accordingly, substantially rigid high-strength metals have been utilized in most prior art radio control racing cars.

Unfortunately, the rigidity of the chassis renders the racing car extremely vulnerable should the car hit a pebble, enter into a turn at maximum speed, bounce, or the like. Should the car crash or roll over at high speed, serious damage can occur to the structure of the car.

It is also important to insure that the motor is clamped or dogged firmly in the desired operative position so that a constant driving engagement for the wheels of the racing car can be provided.

It is an object of the present invention to provide an improved chassis and suspension system for a radio control racing car.

It is another object of this invention to provide a less complex radio control racing car suspension system which can accommodate bounces, pebbles, and like obstructions without permanent damage occurring to the car.

It is a further object of the present invention to provide a radio control racing car which can provide for substantially independent flexing of each wheel of the car.

It is yet another object of the present invention to provide a radio control racing car which includes a motor mount having an integral axle housing secured thereto and includes positive means for clamping a motor in the desired operative position.

It is another object of the present invention to provide a radio control racing car which has a motor mount which is adapted to accurately accommodate a standard 0.19 cubic inch displacement motor and which can be modified to accommodate motors of varying sizes.

Other objects will appear hereinafter.

The above and other objects are accomplished by means of the present invention. A radio control racing car is provided having an adjustable resilient suspension system. The chassis of the racing car is preferably composed of high-strength flexible plastic. Suitable materials include Lexan, glass-filled nylon, and the like. The material selected should be flexible, should not warp, should be able to withstand high temperatures

and should be capable of being molded into a desired shape.

It is not necessary that the entire chassis be composed of flexible material. However, the portion of the chassis which supports the wheels must have the desired flexibility.

Means are provided for adjusting the flexibility of each wheel of the racing car. Adjustability is important when a car is raced on a track having all righthand or all lefthand turns. Additionally, each car's individual characteristics can be accommodated by trial and error by varying the flexibility of each wheel.

A conventional two channel radio is provided for operating the radio control racing car. One channel may be used to effect steering of the car while the other channel may be used for braking and throttle control.

A motor mount which may be an aluminum extrusion having the rear axle support integral therewith is secured to the chassis. The motor, which is generally a Class A.19 cubic inch displacement engine is adapted to be inserted into an opening in the motor mount and shimmed into its desired position. Thereafter, the motor will be positively clamped to the motor mount to prevent movement thereof.

The one-piece extrusion motor mount will also serve to absorb vibration. The flexible suspension and the motor mount will cooperate to prevent the conventional radio receiver mounted on the chassis from being substantially affected by vibrations.

To accomplish the flexibility of the suspension system, slots may be provided in the chassis. The slots, which may be of any desired configuration, will provide increased flexibility for the portion of the chassis supporting each wheel. In effect, the suspension system is hinged to the main body chassis by reason of the slots. The flexibility of the suspension system can be varied by positioning a nut and bolt to vary the effective length of each slot.

For the purpose of illustrating the invention there is shown in the drawings forms which are presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIG. 1 is a perspective view of a chassis for a radio control racing car embodying the features of the present invention.

FIG. 2 is a top plan view of the radio control racing car embodying the features of the present invention.

FIG. 3 is a section view taken along lines 3—3 of FIG. 2.

FIG. 4 is an enlarged section view taken along lines 4—4 of FIG. 3.

Referring now to the drawings in detail wherein like numerals indicate like elements throughout the several views, there is shown in FIG. 1 a racing car chassis generally indicated by the reference numeral **12**, which is to be incorporated in racing car **10**. Chassis **12** is preferably injection molded from a high-strength flexible polymeric plastic. Suitable polymeric materials include Lexan, glass-filled Lexan and glass-filled nylon.

It is possible that metal having a high degree of flexibility could also be utilized for the chassis. The material selected for the chassis **12** should have high strength, should not warp, and should be able to withstand high temperatures. When a plastic is utilized, it should be capable of being molded into the desired shape.

The chassis 12 includes a main or central section 14 having longitudinally extending parallel rails 15 and 16 extending upwardly from the upper surface thereof to define a main channel. Side sections 18 and 20 of shorter length than the main section 14 project outwardly from the rails 15 and 16, respectively. Sections 14, 18 and 20 lie in the same plane. Rails 22 and 24 are provided on sections 18 and 20, respectively. Rails 15, 16, 22, and 24 are identical except for length and define side channels on opposite sides of the main channel.

The chassis 12 is provided with a front end portion 26 connected to the section 14 by means of rails 15 and 16. The portion 26 is structurally interrelated in a manner so as to provide a flexible suspension system. The front edge of section 14 is identified by the numeral 28. Inclined mudguards 30 and 32 extend outwardly from the rails 15 and 16, respectively.

An inclined brace 34 extends between the rails 15 and 16. Brace 34 is provided with integral legs 36 and 38 which are inclined and have at their outer extremities a vertical triangular wall integral with the rails 15 and 16. The triangular wall on leg 38 is designated 40 and the corresponding on leg 36 is designated 42.

A central cantilever segment 44 extends between the legs 36 and 38 and is spaced therefrom by means of the slots 46 and 48. The flexibility of segment 44 may be adjusted to render the same more rigid by means of bolts 50 and 52 which interconnect the segment 44 with the legs 36 and 38. The position of bolts 50 and 52 may be adjusted to any position along the length of the slots.

The flexibility of segment 44 and its ability to twist in torsion facilitates the flexible suspension system for the front end of the chassis. The end of segment 44 remote from the brace 34 terminates in an extension 54. Extension 54 and segment 44 are T-shaped and may flex up and down. The segment 44 and extension 54 converge upwardly as will be apparent from FIG. 3. Thus, extension 54 lies in a plane which is inclined rearwardly and downwardly toward the central section 14. The structural interrelationship of segment 44 and extension 54 provides stability without interfering with flexibility.

Members 56 and 58, which may be metal stampings or plastic strips, are bolted to the extension 54 by bolts 70. The free ends of member 54 are inclined upwardly. The free ends of members 56 and 58 are pivotably connected to opposite ends of kingpins 60 attached to the hub 44 of the wheels 66 and 68.

Arm 72 is rigidly secured to the kingpin 60 on wheel 66. Arm 74 is rigidly connected to the kingpin on wheel 68. The arms 72 and 74 are interconnected by a tie rod 76. A steering linkage 68 is connected to arm 74. Hence, steering motions transmitted to one wheel such as wheel 68 will automatically be transmitted by the tie rod 76 to the other wheel.

Referring to FIG. 2, a motor mount 80 is secured to the portion of the section 14 extending beyond the sections 18 and 20. A motor 82 is supported on the mount 80 and is coupled to a gear 84 on axle 86. Wheels 88 and 90 are secured to the axle 86. The entire rear axle assembly and motor mount are shown in greater detail in my above-identified patent application, the disclosure of which is incorporated herein by reference.

The rails 15, 16, 22 and 24 rigidify the chassis and provide compartments or channels for receiving various components of the racing car including radio equipment. The chassis 12 has greater strength with the same twisting action as set forth in my above-mentioned patent application while having greater stability.

Exemplary dimensions for components of the chassis are as follows: The sections 14, 18 and 20 have a thickness of three-sixteenths of an inch. The rails 15, 16, 22 and 24 are one-fourth inch wide and one-half inch high. The brace 34, its legs, and the segment 44 have the same thickness as the thickness of section 14. Segment 44 is inclined upwardly at an angle of approximately 7°–10° while extension 54 is inclined downwardly at an angle of about 12°–15°.

The front edge of the sections 18 and 20 are angled rearwardly so as to provide clearance for the front wheels 66 and 68. The section 14 extends sufficiently rearwardly for a distance so that the rear wheels 88 and 90 do not contact the sections 18 and 20. If desired, the rear edge of the sections 18 and 20 can be angled forwardly to provide additional wheel clearance.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. A racing car comprising a chassis having a main body portion, a cantilever segment on said chassis, said chassis being supported by a set of front wheels and a set of rear wheels, said segment of the chassis supporting one set of said wheels and constituting a flexible suspension for said one set of wheels, said segment having converging portions, means on the chassis for varying the flexibility of one of said segment portions whereby the suspension of the wheels of said one set may be substantially individually varied, said means for varying the flexibility of said portion of said segment including slots on opposite sides of said segment, and locking means in the slots for varying the effective length of the slots;.

2. A racing car as set forth in claim 1 including rigid portions of said chassis being inclined at the same angle as said one portion of the segment.

3. A racing car in accordance with claim 1 wherein said segment extends rearwardly from the front end of the chassis.

4. A racing car in accordance with claim 1 wherein the chassis includes three parallel sections defined by upstanding rails with the middle section being longer than the other sections.

5. A racing car chassis comprising a body portion having a cantilever segment thereon for flexible suspension of wheels to support the chassis, said segment having one end fixed to said chassis and extending rearwardly from the front end of the chassis, said segment having an upwardly inclined portion and being secured to a downwardly inclined portion of flexible material, and means to connect wheels to one of said portions.

6. A chassis in accordance with claim 5 including means on the chassis to selectively vary the flexibility of said segment.

7. A chassis in accordance with claim 5 wherein the portion of the segment integral at one end with the chassis inclined upwardly, and the other portion being inclined downwardly, the downwardly inclined portion

being the portion of the segment to which wheels will be coupled.

8. A chassis in accordance with claim **7** wherein said downwardly inclined portion forms an acute angle with the horizontal which is greater than the corresponding angle between the horizontal and said upwardly inclined portion.

9. A chassis in accordance with claim **5** wherein said body portion is provided with an opening below said segment, a major portion of said segment being positioned at an elevation which is above the elevation of the opening.

10. A chassis in accordance with claim **5** wherein said body portion has a pair of parallel longitudinally extending rails, said segment being supported at the front end of said chassis between said rails, said segment being connected to the chassis by a portion at an elevation below the upper edge of said rails, with a portion of said segment extending above the elevation of the rails.

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