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Dual propeller Off-centred arm Suspension with Side Linkage Steering All Wheel Drive two Wheel motorcycle

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Abstract *— The accompanying Specification portrays that the said innovation identifies with Automotive vehicle's Drive framework which transmits the ability to both the wheels front and back and additionally awkward extra person wheel of Three-wheeler with adjusted Traction Power from the Engine through Limited Slip Differential for bike and Three-wheeler vehicles. The said System can be appended by utilizing the Transfer case for front and back wheels axles which are connected with front and back wheel Gearboxes which transmits the power in Right edge to the Wheels. By utilizing this sorts of Transmission framework Traction of vehicle is considerably more Efficient, Durable and Rugged for different sorts of Road conditions, Gradients, Curves and so on and in addition Fuel Efficiency is likewise expanded by expanding the power yield by lessening the diminishment proportion of the Final Drive..*

Keywords- *Dual propeller, All wheel drive, Side linkage Steering, Two wheeler*

I. Introduction

The invention relates to the two or all wheel drive power unit and transmission system with capability to run scooter or motorcycle as well as vehicles in which all two or three wheels are powered by the same engine and transmission with all terrain driveability option and by reducing the reduction ratio of the Final Drive which increases the speed output of two wheeler or , with the Off-centred Swinging arm suspension system which is rugged, comfortable and durable for All terrains and tracks. Main objective of invention is to develop all terrain all wheel drive motorcycle and two wheeler with capability to run in muddy, snowy terrains where least road grip is available for more sure foot traction can be easily achieved. The said invention consist of dual propeller on one side for front & rear wheels and long arm off centred suspension system and wheel hub centre with side linkage for steering system is designed for rugged ride with durability and comfortable ride. Secondly there is a reduced final drive reduction ratio which increases the speed several folds.

II. PROCESS PLANNING

i.) System analysis

a. Orientation of the system

- The system consists of an all wheel drive motorcycle having two-wheels front and rear. It consists of a swing arm suspension system at front and rear. It consists of a Hub centric steering system. It consists of a two seats like a two wheeler motorcycle. It has two propeller shafts going to the front and rear transfer box from the engine's final drive. It has two hub-axles for the drive system of the wheel. Longitudinal posture installed motor with the Gearbox.

b. Selection of the component

- Two propeller shafts
- Two Transfer cases
- Two Constant velocity joints
- Shafts for steering
- Space frame chassis
- Swing arm suspensions

c. Bill of the components

We have done Market research and found the major components which we can use to build our Invention.

Components	Quantities
Propeller shafts	02
Transfer cases	02
Constant velocity joints	02
Steering shaft	01
Swing arm Suspension	02

II. VEHICLE DESIGN

i.) Create Model

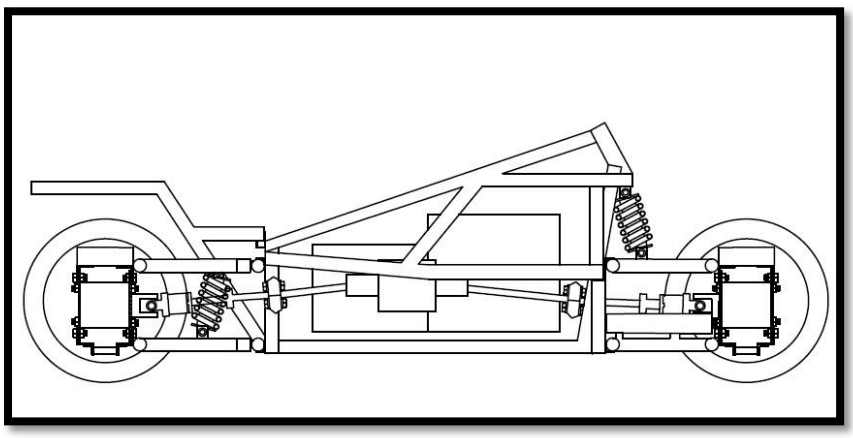

Fig -1: Diagram of All wheel drive motorcycle

- An all wheel drive motorcycle consisting of an two wheel drive system installing a Longitudinal engine within a space-frame chassis, so that we can transmit the power of the engine to both the front and rear wheels of the motorcycle, and provide better mileage and power output of the motorcycle. The motorcycle consisting of the drive in both the front and rear wheels increases the power output of the motorcycle.

ii.) Validate model

- In model validation the problems faced were modified and corrected for more comfortable use and betterment for the rider to use.
- The problems faced were:
  1. Power distribution
  2. Heavyweight Chassis
  3. Big size engine
  4. Less steering angle

iii.) Modification in Model

- Better Power distribution due to decrease in drive.
- Lightweight chassis using light weight materials.
- Size reduction of the engine by increasing capacity of the engine.
- Steering angle increased

Fig -2: Modification 1

Fig -3: Modification 2

Fig -4: Modification 3

Fig -5: Modification 4

iv.) RESULTS

- The build consist of an two wheel drive motorcycle, in which the engine provides power and transmits it to both the front and rear wheels of the motorcycle with the help of Front and rear Propeller shafts. Which helps in increasing the power output of the motorcycle resulting better mileage due to transmitting power to both the front and rear wheels and reducing Weight to power ratio of the vehicle. The both front and rear suspension system of the motorcycle having swingarm suspension system eliminates jerks on the handlebars while riding and gives comfort to the rider. Better power output for rough terrains due to high power output.

vi.) CONCLUSION AND FUTURE SCOPE

- In conclusion of the invention we can conclude that the All Wheel drive motorcycle has better output and comfortable then all other motorcycles with great weight to power ratio increasing the power output and giving better mileage. Comforting the rider while riding the motorcycle with the help of the swing arm suspension system. In future scope we can build the motorcycle with better lightweight chassis and reducing the size othe engine and increasing its power output.

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