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# **An Innovative Approach for Automatic Car Cover**

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**Abstract:** In this work an automatic car cover is proposed which will open itself with the help of push button. It covers the whole car with a thin, but a strong material that not only protects the car from rain, dust and mud (in parked situation) but, also from minor scratches. An assembly of different diameter, concentric cylinders is used to form a hoisting pole and also, so that it could be contained in small space when not in use. The cover material is attached to the top of the innermost cylinder on both sides and to a rolling rod, which has the cover rolled on it. For the accomplishment of our task we are using a simple but dependable mechanism of rack-and-pinion gears. A flexible rack is attached to innermost of the 4 concentric, different diameter hollow cylinders. The pinion is attached to a motor, which derives its power from the car battery. As the pinion moves, the rack moves and pushes the innermost cylinder upwards. The bottom of every inner cylinder is attached to the top of the just outer cylinder, but providing the linear motion between the two. When the rack moves, the innermost cylinder is pushed, which in turn, after being completely hoisted makes the second inner cylinder to move. The After second the third cylinder is hoisted and with it the complete four cylinder pole structure is formed. After complete hoisting, whole structure is rotated along the rear parallel axis of the car. The cover takes the shape of the car and the car is well protected. After complete hoisting, whole structure is rotated along the rear parallel axis of the car. The cover takes the shape of the car and the car is well protected. It is most suited for sports car, because sports car generally have open roof.

**Keywords:** Automatic Car Cover, Rack and pinion, Cylinder.

## **I. INTRODUCTION**

difficult and messy task, we came up with the idea of an automated or self-dispensing car cover. The car cover would be simple, dependable, strong and affordable. Keeping this product cost effective is important because it must be able to compete in market when introduced. And, there should not be much difference between the cost of traditional covers and this one. Efforts are being made to even make it multi-purpose, since it could act as a bumper protector also, attached to the rear of the car. The basic objective behind creation of such a product is to simplify and automate the process of covering a car. This makes the process easy and much less tedious

## **II. SUMMARY OF PREVIOUS WORK**

PUBLICATION NO. **US2009140541**

An automatic car cover system, driven by electric motors, for a car, which is equipped with an automatic opening/closing trunk lid. is provided. It includes one cover runner, one holster, one holster casing, one guide, one cover sheet, and one cover sheet un-folder. The cover runner is a small electric motor driven vehicle equipped with caterpillars, which are comprised of magnetic plates covered with rubber. The holster pushes out/rewinds the cover runner, the guide, and the cover sheet with un-folder. The holster comes out of and goes into trunk of the car with aid of a line connected to a reverse power motor installed in the holster.

Publication No. **EP1985486:** It Includes mechanism of pulley with series of canvases, controlled by handles that allows automatically fold or unfold. There are two covers in this mechanism, central cover coiled by itself by means of an axis

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and lateral cover will be united to the main deck. Folding and unfoldings are controlled by means of mechanized hinged connected with motor.

Publication No. **CN102514468**

The invention provides automatic car cover, which comprises a rotating wheel disc and a supporting frame, wherein the rotating wheel disc is mounted at one end of the supporting frame; the other end of the supporting frame is connected with a bracket rotating shaft; the bracket rotating shaft is arranged at the lower edge part of a vertical plate of a box cap; the rotating wheel disc is provided with a rotating disc housing provided with a cover body exit; a wheel disc rotating shaft is arranged in the rotating disc housing; the cover body is connected with the wheel disc rotating shaft and curled in the rotating wheel disc; and a keel frame formed by a plurality of longitudinal anti-fatigue thin steel wires of a keel and a plurality of transverse flexible pressure springs is arranged in the middle of the cover body.

Publication No. **CN101708680**

Car cover is characterized in that the two sides of a car are separately provided with a scalable support bar and provided with a curtain-tarpaulin which can be folded or unfolded by the support bar. The car cover arranged on the car can be folded or unfolded without affecting the car shape.

Publication No. **CN102774258**

**In this** publication car cover connected in to whole with car. It consists of a rotating shaft, telescopic rod and car cover box. It works by remote controller and temperature sensing device which works according to the automatic judgment of inside and outside temperature.

Publication No. **CN102642458**

This invention shows car cover which consist car cover collecting device and light sensor. A hand operated traction strip is arranged at the front end of the car cover. It locks by hand operated strip, springs are connected at two ends of car cover winding drums, rear end of the car cover is connected on to the car cover winding drum. The car cover can be opened, folded and wound more conveniently and neatly by the aid of the zippers disposed on the peripheral car edges

Publication No. **CN101734128**

The invention provides a built-in type car cover. The downside of the car trunk is internally provided with a built-in automatic cover-winding device. The middle of the built-in automatic cover-winding device is provided with a transverse scroll bar, the car cover is wound on the scroll bar, and the scroll bar is connected to an instrumentation operation station in the car by setting leads in an electrically winding way. When the car runs, the built-in car cover is wound inside the downside of the car trunk, when the car needs to be covered during the parking, the cover can be drawn out and pulled forward from the back to cover the whole car body, and the winding and loosing of the scroll bar are operated by an electric button on an instrument panel in the car.

Publication No. **JP56160215**

**This invention includes** automatic car cover connected to the inner surface of car cover by shaft mounted in a hollow cylinder through a sheet and drives by remote controlled motor.

### III. DIFFERENCE BETWEEN SUGGESTED CLAIM AND PREVIOUS WORK

For quarter car model  $1/4^{\text{th}}$  of the total sprung mass is considered. With reference of the diagram of the quarter car model from chapter 4, the procedure to build the model in ADAMS is given below.

In this invention concentric cylinder moves in two directions by using remote controlled RC motor first in longitudinal and other in transverse direction. The ends of the inner most cylinders are joined by the thin car cover material with anti scratch and heat resistant property. Some of the mechanisms were also used in previous publication bur following clams are new in this invention.

1. R C motor
2. Concentric cylinder with spring

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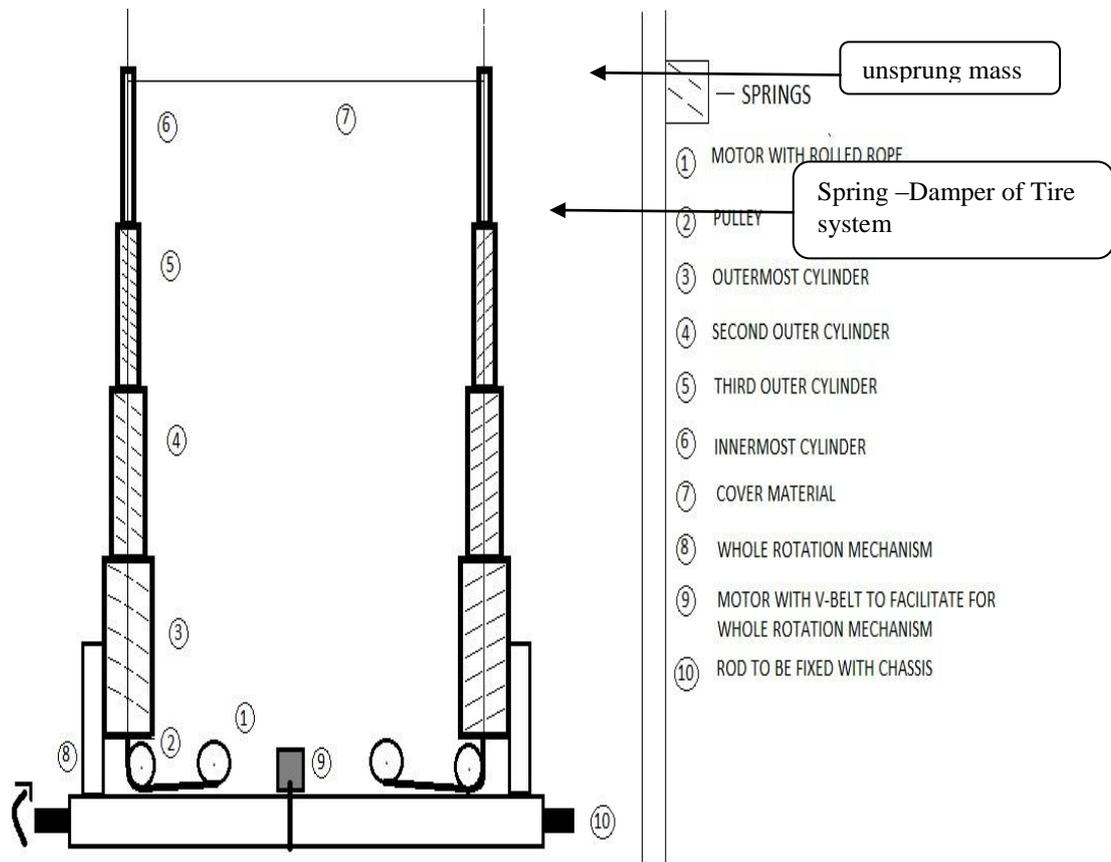
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3. Belt of thin string to minimize cost and weight.

## IV. ADVANTAGES

1. Covered parking shortage.
2. Appearance of minor scratches on most parked cars.
3. Need for presence of two people to cover a car with a conventional car cover.
4. Traditional covers are difficult to apply and mess to use.

## V. LINE DIAGRAM



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## V. 3D DIAGRAM



## VI. DETAILED DESCRIPTION OF MODEL PARTS

The numbering has been done in the above diagram according to the sequence of the processes.

1. Pinion – The pinion of the whole mechanism is a small gear made of mild steel. It is driven by a motor at a very low rpm. The power for this motor is derived from the car battery itself. It is directly meshed with the rack.
2. Rack – A flexible rack is to be used so that it would be able to bend. This rack is attached to the bottom of the innermost cylinder of the pole assembly.
3. Innermost cylinder – This cylinder is of minimum diameter. It moves upwards with the movement of rack. With the help of a welded ring, at the bottom, this cylinder is attached to the just outer cylinder.
4. Second inner cylinder – The top of this cylinder, through a welded ring, is attached to the inner cylinder. Which facilitates the movement of this cylinder (upwards), after the innermost cylinder has been completely lifted.
5. Third inner cylinder – The top of this cylinder, through a welded ring, is attached to the second inner cylinder. Which facilitates the movement of this cylinder (upwards), after the second inner cylinder has been completely lifted.
6. Outermost cylinder – This is the cylinder with largest diameter. This is directly attached to the rotating mechanism and base.
7. Cover material – The material used for covering the car is an extremely strong canvas made up of a cross woven polyester and cotton blend. This canvas is immensely tough but cheap.
8. Turning or rotating mechanism – After complete hoisting, whole structure is rotated along the rear parallel axis of the car. This is done through another motor. The cover material takes the shape of the car and the car is well protected.

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## VII. WORKING OF MODEL

When the motor (1) starts with help of remote it releases the concentric cylinders (6,5,4,3 resp.) with the help of pretension spring inside each cylinders. The rope connected by motor and passes through pulley (2) gives the motion in longitudinal direction. When the concentric cylinder fully opens, whole rotation mechanism which is connected outer most cylinder and this mechanism connected by rod (10) to be fixed with chassis via RC motor gives the motion in transverse direction. The ends of innermost cylinders are joined by cover material (7), which covers the car fully. To unwind the cover simply push the remote button to work the motor in opposite direction. This is a simple and fully automatic light weight and low cost mechanism to cover the car. Because of its less weight it doesn't affects the mileage of car.

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