

Analysis and New design for automobile wipers

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ABSTRACT

This paper presents the new mechanism of windshield wiper which is more efficient whether it is cost or area covered or its position on windshield. This model also overcomes the problem of formation of mist on the interior the windshield. The proposed model also has a unique placement of windshield wiper which provides more clearance of windshield. It covers maximum area (Approx. 96%) of wind shield. It provides the solution for the problem of formation of mist on the interior of the windshield. It is cheap and not confusing as it has only one wiper.

Keyword: - Wiper, Mist formation, Blades, Mist Sensor

1. INTRODUCTION

All automotive industries seek to provide low cost system for all the applications including automatic wiper system in automobile. In recent trends, automotive industries focusing on autonomous vehicle which means self- drive system on different applications. For this scenario, this paper offers low cost wiper system with simple and effective concept of electro mechanical concept to wipe the windscreen automatically. Automatic wiping has been done during rainfall without human interrupt. Thus, an uninterrupted makes to avoid distraction of the drive and secure from accidents. Nowadays vehicles are more automated whereas the cost of the embedded system used for different critical applications are too high. Basically, increase in technology will enhance the vehicle cost. This criterion makes to develop low cost automatic wiper system. The wiper system has been implemented to forecast in all low-cost vehicles.

2. BASIC COMPONENTS OF WIPER

The basic components of automatic wipers are:

- ☐ External sensors
- ☐ Internal sensors
- ☐ Microcontroller
- ☐ Wiper motor

2.1 External and Internal Sensors

In the Fig1, there are three sensors which are used to sense the level of the water in the beaker. The water falling on the windshield is collected in the beaker which is placed at a prescribed position. The beaker has a constant outflow at the bottom. This provided to ensure right amount of water, which is collected in the beaker based on the amount of rain falling. If the rain drizzles, only small amount of water will be collected in the beaker. At this point sensor1 are kept in the opposite sides of the beaker at the same level. When the rain is medium, the water collected in the beaker will up to the half of the beaker. At this place, another sensor2 are placed opposite to each other in the beaker. When the rain is heavy, the water collected in the beaker will be up to the maximum level of the beaker. At this level, another sensor3 are placed opposite to each other in the beaker.

These sensors are supplied with a current of 5V from the micro controller. So, when the water collects to the bottom level covers the sensor1, the current pass between these sensors and hence completes the circuit of the first set of sensors. In the same way, the other two sets of sensors 2 and 3 will conduct the current when the water level reaches respective positions.

The mist sensors are placed on the windshield in such a way that the wires connected to the set of sensors are faced towards the windshield. So that the mist formed on the wind shield is being sensed by these sensors. The two set of sensors are placed very close to each other.

The internal sensor is also works on the same principle as that of the external one as explained in the previous section. Internal sensor also has a current of 5V from the same microcontroller. When the mist is formed on the windshield inside the vehicle the circuit is closed and sends the signal to the microcontroller to actuate the internal wiper motor.

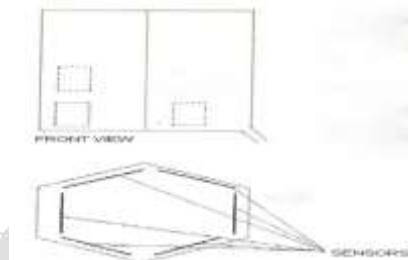


Fig -1: Front View of Sensors

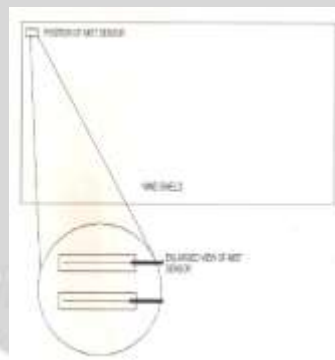


Fig -2: Mist Sensors

2.2 Wiper Motor

The wiper motor is used in this project is of two speed stepper motor of 12V. The two speeds are used for the wiping actions.

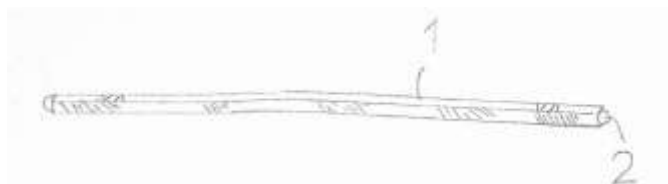
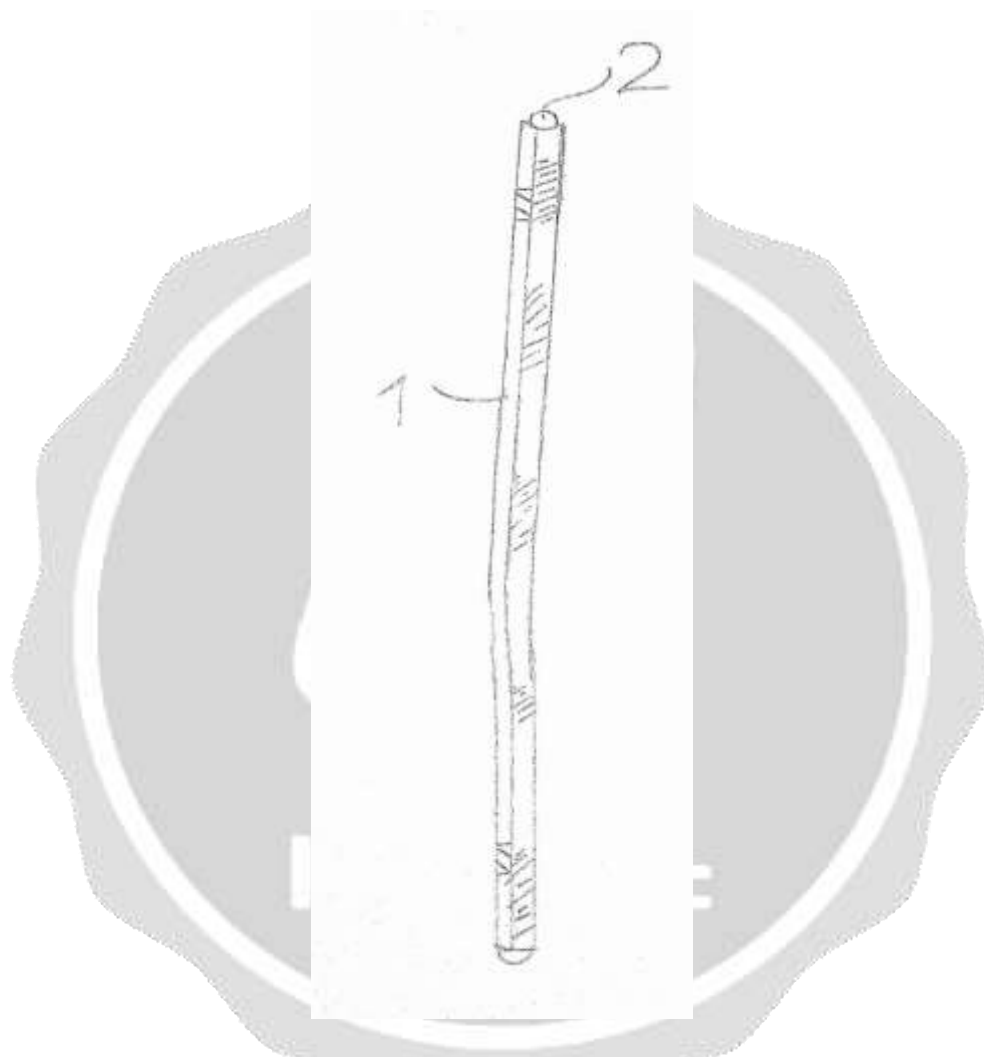
2.3 Microcontroller

The microcontroller used is an 8051 microcontroller.

3. DESIGN OF BLADES



Fig -3: Perspective View

**Fig -4: Side View****Fig -5: Front View**

A windscreen wiper blade arrangement comprises a windscreen wiper blade (1) and connector (Roller Ball) (2) for connecting the windscreen wiper blade. The blade (1) is so arranged from both sides of windscreen (i.e. Front and Back) enabling the motion of wiper simultaneously clearing the windscreen from both sides.

Table -1: Duty Cycle

DUTY CYCLE	WIPER MOTOR SPEED
25	Two low
50	Low
75	Medium
100	High


4. CONCLUSION

This paper presents a new wiper mechanism and placement by which the efficiency can be increased and is adaptive according to user.

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BIOGRAPHIES

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