

DESIGN OF VENTILATED SEAT OF TWO WHEELER

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Abstract

A ventilated seat is a type of seat that incorporates a ventilation system to provide cool air flow to the occupant. ventilated seats are becoming popular in high end cars but to level up the comfort and reach a major no. of population using two-wheeler there is a need of ventilated seat for two wheelers. the typical system consist of cooling fans to circulate air in the system also requires heating element and temperature controller, heating element to provide warm air during cold weather . Further system also include male female pins , switches and the main item of the system seat and perforated cover . together this system is fully capable of providing thermal comfort to the rider during long rides. Main objective the project is to study whether ventilated seat for two-wheeler is a liable addition to two wheelers or not and also it can provide comfort to the occupant for which the system is created.

Introduction

These paper relates to the art of automobile seating, more itself particularly to the ventilated seating wherein air may be drawn there through seat to enhance occupant comfort. The cool air ventilation seat cover relates to an external accessory fitment to seating system which is easy to install into a seat and which is easy to adapt to a wide variety of comfort solutions. This paper includes the performance study of ventilated seat. Ventilated seat cover typically is designed to enhance occupant comfort by passing air through the covering of the seat itself.

Ventilated Seats or seat ventilation is a feature that is built into the seats and it directs air through the seat unto the occupant for increased comfort especially on long journeys. Ventilated seats function via several small fans in the seat cushion and backrest. The fans draw air from inside the cabin and into the seat. The air is then goes through plastic ducts, an air permeable fabric and distributes it evenly throughout the seat via perforations in the leather. There are vehicles that offer several fan speeds in their seat ventilation (usually two or three). When switched on they begin on the highest speed and may automatically reduce the fan speed after a pre-determined time set by the manufacturer. The fans start on the highest speed because it is presumed that is when ventilation will be needed the most, at the beginning. You can always select your preferred fan speed at any time.

The buttons or controls for the ventilated seats can be situated on the center console, the doors or on the seats. These buttons or switches are usually close to other buttons that control seat functions. There will be a separate control for each seat and each one can be ventilated independently. They usually work alongside heated seats. If seat ventilation is offered as an option it is usually offered with heated seats with the button for the ventilation close next to the button for the heated seats. As with any luxury seating feature seat ventilation will be most

common on the driver seat. Vehicles with a little more luxury may have both the driver and front passenger seat ventilated and it not uncommon to see ventilated rear seats as well but on the two outer seats. Ventilating can also co-exist and function with other car seat luxuries such as cooled seats, power seats and massage seats.

Ever since it started running on roads, seats have been an integral part of the automobile. From the very early times when there existed simple benches, to the latest state-of-the-art massaging chairs, automobile seats have changed immensely over time. They have transformed from a flat horizontal plank, to contoured individual chairs capable of catering to individual needs. Heating and cooling features have turned car seats into ambient zones on-the-go. With the addition of softer and more comfortable foams, leather, massage function, they have become much more luxurious. The implementation of modern three-point seatbelt along with airbags has made seats safer. Conclusively, the plethora of features and functions on modern-day car seats turned them into an extremely complex system.

Material used

Material is the key requirement for any idea to be fabricated to reality, a proper selection of material is important in various factors like for better efficiency, cost reduction, comfort. Material required are listed below.

- 1) seat
- 2) cooling Fan
- 3) Peltier
- 4) Heating element
- 5) Temperature controller
- 6) Heat sink
- 7) Switch
- 8) Power supply
- 9) Perforated cover
- 10) Seat foam

Construction

Despite advancements in heating and cooling for seats, we had yet to see a cooling technology that truly eliminated the discomfort of hot-weather, To accomplish conduction heating and cooling, a thermoelectric module located within the seat directly regulates the temperature. Electricity is applied by a thermoelectric module to the graphene material, causing one side of the material to absorb heat and the opposing side to dissipate heat. By reversing electrical flow, the hot and cold temperatures alternate sides. A graphene material, which is a nanomaterial created from 100% carbon atoms, is then used to ensure the heating and cooling is dispersed throughout the entire seat. We use several fans inside the seat to circulate air through a layer of material that diffuses the air, which then blows out through the perforated or mesh upholstery. Seat will be equipped with two Or three fans to cool The seat perfectly ,The air blowing out of the fans might or might not be refrigerated. Refrigerated air comes from a cooling element in the seat. The well-cushioned Classic Seat delivers unprecedented comfort with Thunderstroke models. Independent rider and passenger controls (low, medium, high) allow the rider and passenger to remain in

command of their heating and cooling levels. The whole system of ventilated seat gets powered by conventional battery of 12v, though the whole system consumes too much of power but battery which is being charged will not become a problem rather will lead to work with more load on it, by this there won't be a issue of battery discharging as it will be charged when bike in running condition.

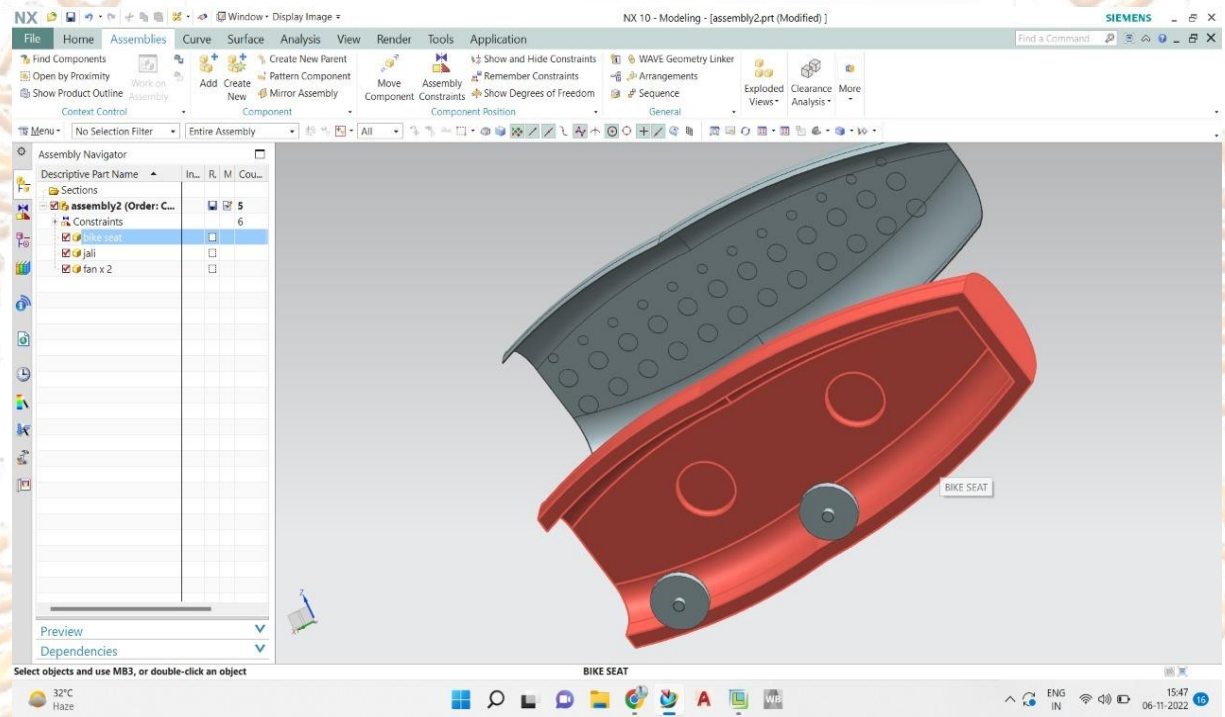
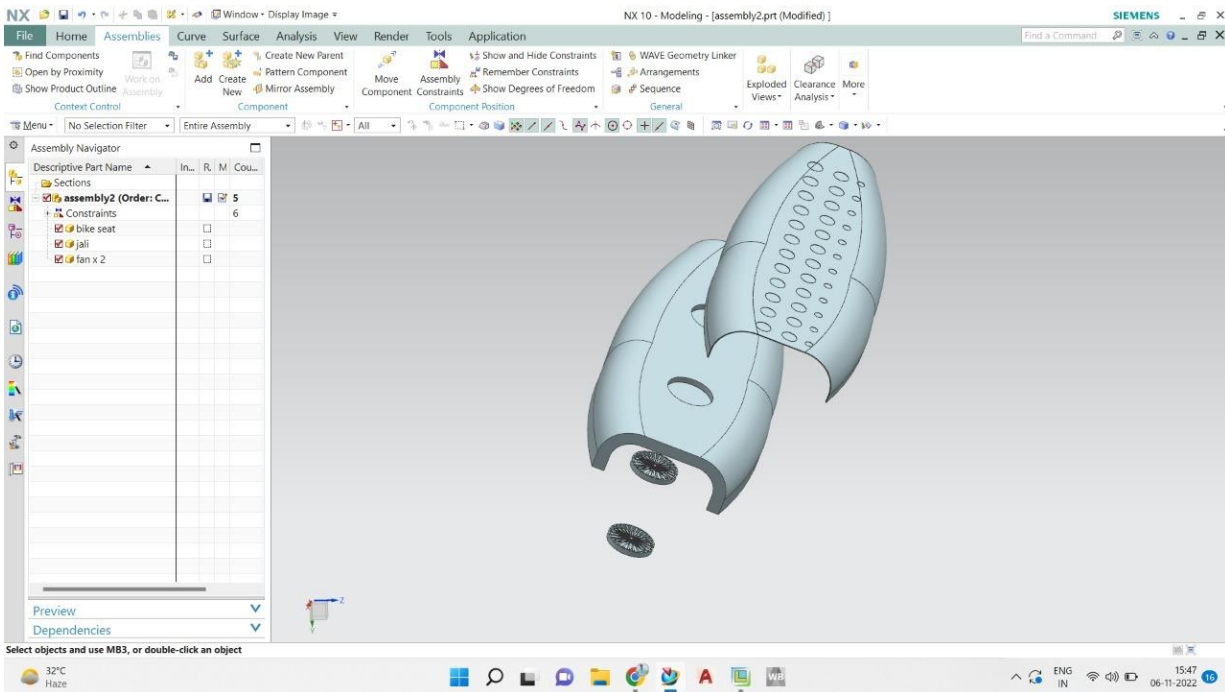
Construction of ventilated seat for two wheeler has a different construction from the conventional ventilated seat, whereas seat is being constructed for two wheeler. Fans are fitted below the hard plastic layer in the seat by cut section for the placing of fan, above fan heating element for heating and peltier for cooling is fitted. So now there are two more equipment above the fan one for heating the seat and other for cooling both heating and cooling will be done but to regulate the air fan is fitted below them.

Working

Ventilated seat for two wheeler is designed to provide comfort to the rider during long rides . the system is powered by the battery both heating and cooling is done by two separate equipment, for cooling a device named peltier is used to cool the seat it absorbs heat from one side whereas provide cool air from the other side now this air is circulated in the whole seat by the fan placed just above the peltier. Now for heating, heating element which is placed just above the fan directly to the hard plastic and cushion now when the heating. element is turned on from switch its pad get start heating and here also heat is transferred to whole seat via fan . now the system consist of various switch for heating, cooling and operating fan .

Design of ventilated seat

The main goal of the seat ventilation is to improve Thermal comfort. It is incredibly difficult to quantify, And many factors like air temperature, humidity, Clothing insulation, and metabolic rate influence the Overall comfort. Considering the interior of a car, the Window size and the physiological differences are Significant to the feeling of thermal comfort. When air is circulated to cool down a person, it can be Perceived as pleasant in the beginning. But, after the Person is cooled down, it can be perceived as an Unwanted draft. The most sensitive area is the lower Back, where a strong cooling can cause cramps Another critical aspect is that spot cooling can cause Thermal discomfort



Material specification

Cooling fan of 12v -0.6 amp

Heating element of 12v- 2.91amp total power 35 N

Peltier 12v- 6amp power 72W

Temperature controller 12v current range of 2amp-10amp

Total power consumption of the whole unit

Static current 35ma

Current 65ma

Result analysis

the seat is capable of cooling as well as heating the seat

Conclusion

Detail study has been done to formulate a generalized process for designing and developing a ventilated seat for an automobile. Ventilation of an automobile seat may help to improve human comfort, ventilation can reduce the temperature of the seats if the vehicle was parked in the sun and they became hot. The research articles explain about the use of thermal seat for car driver comfort. The research study formulating the use of computational fluid dynamics to predict the flow of cold air over the fabricated seat. Overall the thermal comfort of seat through computational fluid analysis studied

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