International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES)
Impact Factor: 3.45 (SJIF-2015), e-ISSN: 2455-2585
Volume 3, Issue 10, October-2017

AN AIR CONDITIONED HELMET WITH EXTRA FEATURES BASED ON IOT TECHNOLOGY

A.V.S.Bharadwaz, Prof.M.L.S.Deva kumar

[1]*M.tech ,Mechanical Engineering, JNTUA College Of Engineering, Anantapuram, India*
[2]*Prof. Mechanical Engineering, JNTUA College Of Engineering, Anantapuram, India*

ABSTRACT:

An armor or protective head covering gadget made of hard material is called helmet. These helmets are worn by soldiers, policemen, firemen, bike riders for safety of people to prevent fatal accidents. So now a days helmets are made mandatory for motor bike riders. Due to hot climatic conditions these essential gadget has been avoided by many people, which is very offensive in eyes of law and insecure to the rider. To overcome these adversities a helmet with modified design will be presented in the present project.

The atmospheric air is used for air conditioning purpose without any external work. Convergent nozzle and divergent nozzles are inserted into the helmet body to achieve air conditioning effect. A light weight solar panel with adapter facility will be provided for mobile charging purpose. A microphone and speaker connected to mobile placed in the helmet for easy acceptability of cell phone operation.

A GPS and GSM tracking sensors with IOT concept will be inserted in this gadget to trace the helmet location at times of distress faced in journey. Thus advanced helmet will facilities the need of the society.

Keywords: nozzles, solar panel, microphone, GPS and GSM tracking device.

1. INTRODUCTION

An armor or protective head covering gadget made of hard material is called helmet. These helmets are worn by soldiers, policemen, firemen, bike riders for safety of people to prevent fatal accidents.

The main reason why people avoid conventional helmets is lack of thermal comfort, unable to lift calls and it doesn't have any additional feature. In this project an attempt is made to design a thermal comfort helmet by providing ventilation using nozzles and adding some additional features like providing microphone, GPS tracking device-to trace a person when rider met with injuries, accidents. A solar panel at the top of helmet used to recharge mobile battery and GPS device as well.

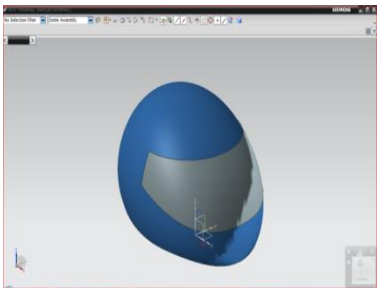
2. OBJECTIVES

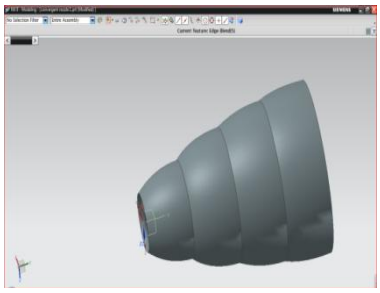
1. To provide thermal comfortable atmosphere inside the helmet.
2. To share the location when rider is in distress condition.
3. To attempt emergency calls when rider struck at traffic signal.
4. To charge a mobile using a solar panel.
5.

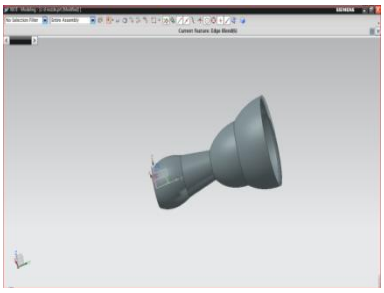
3. DESIGN OF HELMET AND ITS COMPONENTS

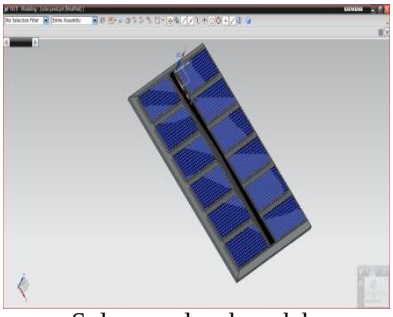
NX(UniGraphics) is the design software used to design the components of a helmet. NX is computer aided design, manufacture, and analysis feature based model software. The designer can do design, assembling-manufacture the components, and analysis of a product in a single software. The design of helmet components can prepare individually as a part files. The individual components can be grouped in assembly workbench. The following figure shows the details of individual part models and their assembled product.

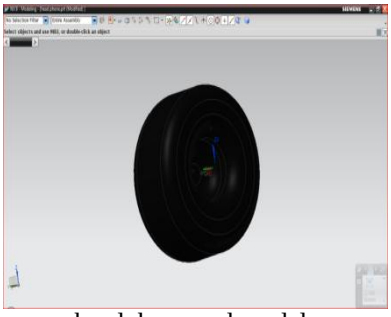
Components of helmet:


NX helmet cad model


NX convergent nozzle cad model


NX C-D nozzle cad model.


Solar panel cad model.


headphone cad model.

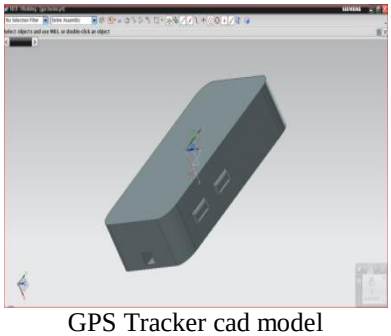

GPS Tracker cad model

Fig.1. nx part files

4. HARDWARE SETUP:

The new branded conventional steelbird helmet is taken. 3D printed Nozzles are attached on either of helmet. The headset is arranged to the inner surface of left side of helmet. The 6V solar panel is arranged at the top of helmet and the wires are connected to the battery and to female usb port, rider can use this cable for charging mobiles. The GPSTracker is arranged on the rear part of the helmet rider can use to share communication at time of distress. The total assembly of advanced helmet is shown the following diagram.


Fig.2. hardware arrangement to helmet.

5. RESULTS:

→ By using NX 10.0 the helmet and part models are designed and assembled successfully.

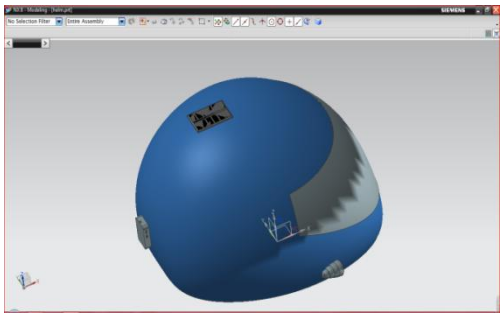
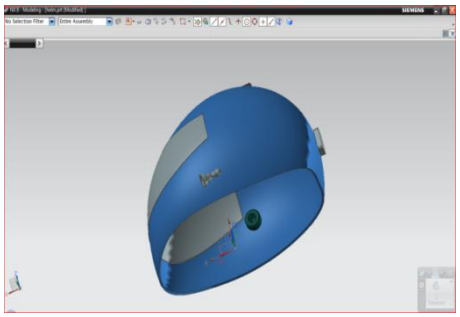
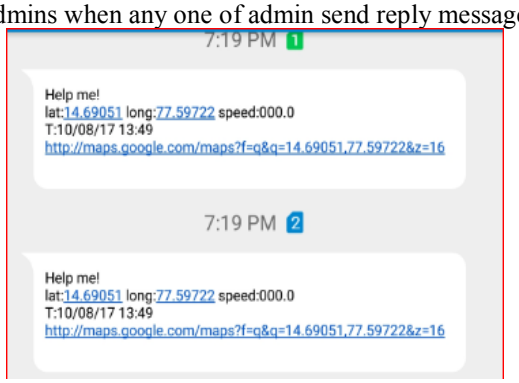
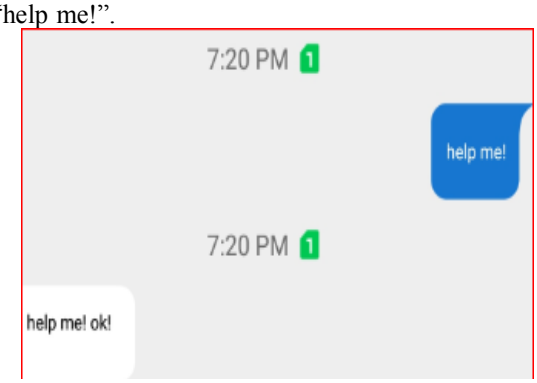



Fig.3. helmet assembly with all hardware components

→ **GPS Tracker**: There will be 5 admin members for the device. When SOS button of GPS device is pressed, the device starts sending message to all device admins for every 3 minute. Device stops sending message to 5 admins when any one of admin send reply message as "help me!".





→ **Nozzle:**
When convergent nozzle is used a temperature drop of 3.4^0C is noticed.
When convergent-divergent nozzle is used a temperature drop of 1.6^0C is noticed

→ **Solar panel**: with the help of 6v solar panel a mobile device is being charged. In an average solar panel needs 5 hours to charge a 1000 mah battery.

→ **Headphone**: The headphone is attached to the helmet and very help full to lift and cut calls at the time of riding.

6. CONCLUSION

The sophisticated advanced helmet is developed with extra features like GPS system operated with IoT technology, mobile charging using solar panel, mobile call receiving using embedded headphone system and air ventilation system using convergent and convergent – divergent nozzles.

REFERENCES

1. Anderson, John D, Modern Compressible Flow with Historical Perspective,
Carlos Castilla-Rubio and Simon Willis, Cisco IBSG, March 2009,
2. Chang-Su Ryu, "IoT-based Intelligent for Fire Emergency Response Systems", International Journal of Smart Home,Vol. 9, No. 3 (2015), pp. 161-168.
3. Further mention of cost competitiveness: "Solar Power Lightens Up with Thin-Film Technology", Scientific American, April 2008.
4. Green et. al., Progress in Photovoltaics: Research and Applications 2012 10.1002/pip.2163
http://www.cisco.com/web/about/ac79/docs/pov/Planetary_Skin_POV_vFINAL_spw
5. http://www.solar-facts-and-advice.com/amorphoussilicon.
6. https://en.wikipedia.org/wiki/headphonetypes
7. Institute for Energy Research, 30 June 2006
8. John A. Stankovic, "Research Directions for the Internet of Things", IEEE, 2014.
9. Krebs et. al., Solar Energy Materials and Solar Cells 2009 10.1016/j.solmat.2008.10.004 McGraw Hill, 3rd Edition. Boston, 2003.
10. Robinson, K. K., Briggs, D. E., "Pressure Drop of Air Flowing Across Triangular Pitch Banks of Finned Tubes," Chemical Engineering Progress Symposium Series, Volume 62, No. 64, 1966.
11. Zebbiche T. and Youbi Z., 2006. Supersonic Plug Nozzle Design at High Temperature. Application for Air, AIAA-2006-0592, 44th Aerospace Sciences Meeting and Exhibit, 9-12 Jan. 2006, Reno Nevada, Reno Hilton, USA.
12. Sheela Joseph, Akhil S, Narayanankutty, Amalraj PM (2014) RF Transceiver Based Traffic Alert System for Automobiles. International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering 3: 7623-7627
13. Prudhvi Raj R, Sri Krishna Kanth, Bhargav Aditya Bharath K (2014) "Smart-tec Helmet" Electrical and Electronics Engineering, GITAM University, Rushikonda, isakhapatnam, India. Advance in Electronic and Electric Engineering 4: 493-498.