ISSN: 2277 – 5528
Impact Factor- 4.015

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & MANAGEMENT

E- RIKSHA BATTERY CHARGING BY LIQUID ELECTROLYTE

Nivedita Singh [1], Gaukaran[2], Santosh Sahu [3] and Toman Lal [4]
Assistant professor [1], Diploma Student [2,3,4]
Department of Electrical Engineering,
Shri Rawatpura Sarkar University, Raipur , Chhatisgarh, India
nkshatri9@gmail.com[1], wwwgaukaran26@gmail.com [2], 0707santoshsahu@gmail.com [3]
tomanlal112@gmail.com [4]

ABSTRACT

Electric three-wheeler auto rickshaws known as E - Riksha are becoming quite common. Due to noticeable advantages offered by these vehicles such as zero carbon emission and no requirement of gas encourages people to transition from traditional fuel-operated vehicle to electric vehicles. The battery charging for these vehicles employ bulky chargers which takes 7-8 hours to charge one battery. As a country which suffers from power shortages, it is highly desirable to have a charging technique that is more efficient and less time consuming. In this paper, a new type of charging is proposed which uses liquid charge technique.

KEY WORDS: liquid charge pump; battery charging technique; electrolyte; E- Riksha

INTRODUCTION

Worldwide population increase has led to an exponential rise in the sum of transportation vehicles. Almost all of these vehicles are run on fossil fuels, which causes ecological struggle. The rapid shrink of fossil fuel reserves is an equally alarming issue. As a green solution, electric vehicles are slowly but surely becoming more and more popular. Electric vehicles have several advantages over regular vehicle; they do not require any gas, they emit no harmful substances into the atmosphere, they are subsidized by the government, and they require less maintenance. However, there are a few disadvantages of these vehicles as well. For occurrence, electric vehicles are not suitable for countries facing major shortage of power. Electric vehicles include a battery bank which needs to be charged at regular intervals. The charging of these E Riksha required 7-8 hours of continuous charging . If these charging are replaced with more efficient ones, it will save a substantial amount of energy and in the process, encourage countries with power shortages to use more electric vehicles. The use of electric three wheeler auto rickshaws known as E – Riksha are becoming more and more popular.. Hence, there exists an excellent opportunity to save energy by improving the efficiency of easy bike by using liquid battery charging pump. Using the proposed charge pump, it is possible to achieve full battery charge after discharge of battery just like a fuel pump in a car.

LITERATURE SURVEY

A considerable amount of research has been done over the years regarding the various aspects of electric vehicle charging. Pellitteri et al projected an efficient wireless charging scheme for electric pedal bikes. Bass and Zimmerman explored the effects of electric vehicle charging on the power distribution system. Wang et al highlighted the various design aspects related to inductive power transfer system necessary for constructing a contactless charger for electric vehicles. Zhou et al projected a multi function bi directional charger for plug-in hybrid electric vehicles, which can accomplish three functions namely, charging, vehicle to grid, and vehicle to home.

PROPOSED SYSTEM

In the proposed system firstly we know The liquid compound of a battery is called the

ISSN: 2277 – 5528
Impact Factor- 4.015

electrolyte. This is the part of the battery that facilitates the chemical reaction to produce electricity which is used to run the E Riksha. electrolyte solution used is H_2SO_4. The main draw-back of E Riksha is charging, the battery will drain out in 4-5 hours and it takes approx 7-8 hours to charge it again. For making e-Riksha charge quickly we have to modify our existing model by two battery instead of one battery system. In the proposed system we change liquid of battery through liquid charge pump instead of whole battery, for this we required normal commercial pump to drain out uncharged liquid and to fill charge liquid into battery.

BATTERY CHARGING LAYOUT:

There are few steps to charge battery

Step I:

Firstly if the battery of a E- Riiksha is drain fully then we have to charge it from traditional method but in our proposed plan we will charge it by changing the liquid. For this in step I we will first discharge battery liquid using pump into discharge liquid container.

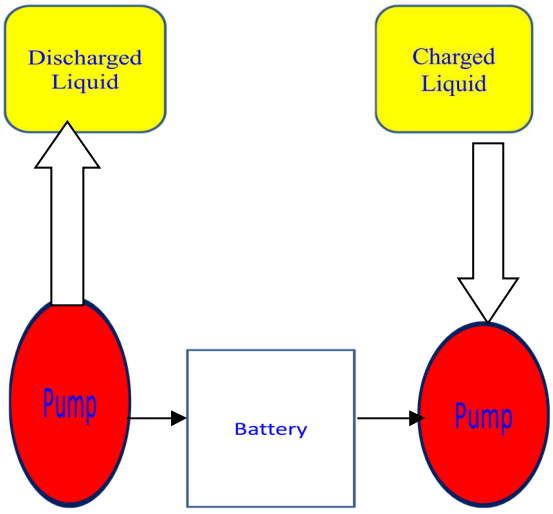
Step II:

In this step after discharging the battery completely now we will fill battery with charge liquid through pump. once it s fully charged then it is ready to use again just within 5 min, here no need to wait 7-8 hours to charge battery using conventional charger point method.

Step III:

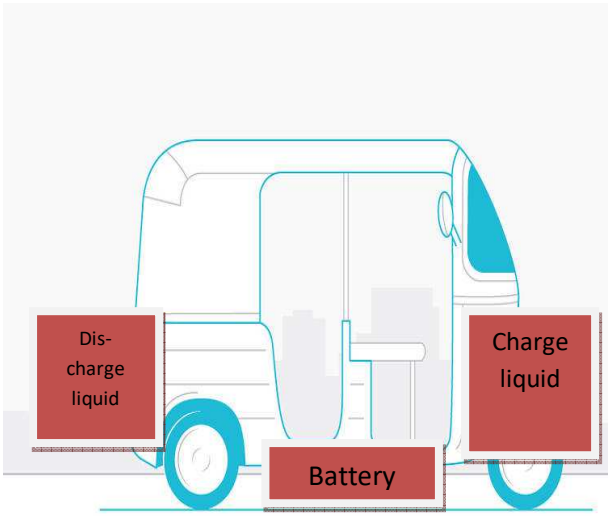
In this step we will drop the uncharged battery liquid to battery charging pump, this should be like traditional fuel pump but instead of petrol or diesel here battery is charged using solar power.

Solar power is used to charge the battery this is save our straight use of electric power.



TWO WAY CHARGING IN E-RIKSHA:

This is modified form of E –riksha in this we required two



BENEFITS OF E-RICKSHAW CONSIDERING ITS FUTURE PROSPECTS

- **ECO–FRIENDLY** – Perceptibly auto mobiles make our life easier but it also accountable to spread so tremendous pollution all over the country. So, e-rickshaws could be a good substitute for this as they will charge through solar power don't emit any harmful gases. Moreover, as they run through

ISSN: 2277 – 5528
Impact Factor- 4.015

batteries so it is easy to recharge them at regular intervals with less time or can with no time delay.

- **SAFETY** – Vehicles and safety are related to each other, though there is still a risk to meet accidents in conventional vehicles while charging. But to a greater extent, you can get believe in e- rickshaw as they are much safer as there is no need to connect direct power point.
- **COST** – As they are battery liquid changer so they are not much costlier. Also, the cost of maintaining the vehicle is also a lesser amount as compared to other vehicles.
- **RECYCLE** – A very important benefit of this vehicle is that the battery on which it runs can be recycled after certain intervals.

So, looking into the benefits one can easily say that not only this business but also e-rickshaw with liquid fuel charging pump will prove to be successful to replace the existing auto rickshaws.

CONCLUSIONS

In this paper, a detailed description of the design and construction of a more efficient and cost-effective charger for E Riksha has been presented. A direct comparison of the proposed charger has been made with a typical conventional charger by creating the same charging conditions in the lab. The use of liquid charging pump in the proposed design not only makes it much convinent, but also more efficient. Furthermore, the cost of such a charging is expected to fall with time, whereas traditional chargers are likely to become more expensive. The experimental findings suggest that if the proposed charging is produced in a large scale, it has the potential to completely replace the conventional chargers. Considering the fact that there are about one million E Riksha at present, implementing the proposed charging scheme can boost energy savings by a huge amount.

REFERENCES

1. Conserve Energy Future. [Online]. Available: http://www.conserveenergy-future.com/advantages-and-disadvantages-of-electric-cars.php, Accessed: Aug. 4, 2015.
2. C. S. Wang, O. H. Stielau, and Grant A. Covic, “Design Considerations for a Contactless Electric Vehicle Battery Charger,” IEEE Trans. Ind. Electron.,vol. 52, no. 5, pp. 1308-1314, Oct. 2005.
3. Electrical Engineering Portal. [Online]. Available: http://electricalengineering-portal.com/transformer-heat-copper-and-iron-losses, Accessed on: Sep. 3, 2015.
4. F.Pellitteri, V. Boscaino, A. O. Di Tommaso, F. Genduso, and R. Miceli, “E-bike battery charging: Methods and circuits,” in Proc. Int. Conf. Clean Elect. Power (ICCEP), 2013, Alghero, 11-13 Jun. 2013, pp. 107-114.
5. N. Zimmerman and R. Bass, “Impacts of electric vehicle charging on electric power distribution systems,” Oregon Transportation Res. and Edu. Consortium, Portland, OR, USA, Sep. 2013.
6. Radio-Electronics.com. [Online]. Available: http://www.radioelectronics.com/info/rf-technology-design/rf-filters/simple-lc-lowpassfilter-design.php, Accessed on: Sep. 7, 2015
7. X. Zhou, G. Wang, S.Lukic, S. Bhattacharya, and A. Huang, “Multifunction bi-directional battery charger for plug-in hybrid electric vehicle application,” in Proc. Energy Conversion Congr. and Exposition, 2009, San Jose, CA, USA, 20-24 Sep. 2009, pp. 3930–3936.