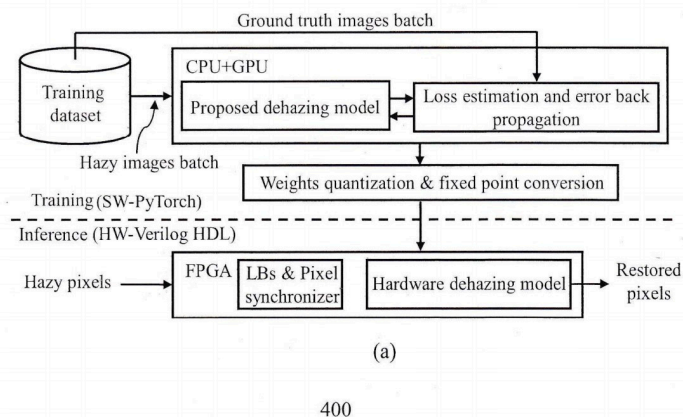
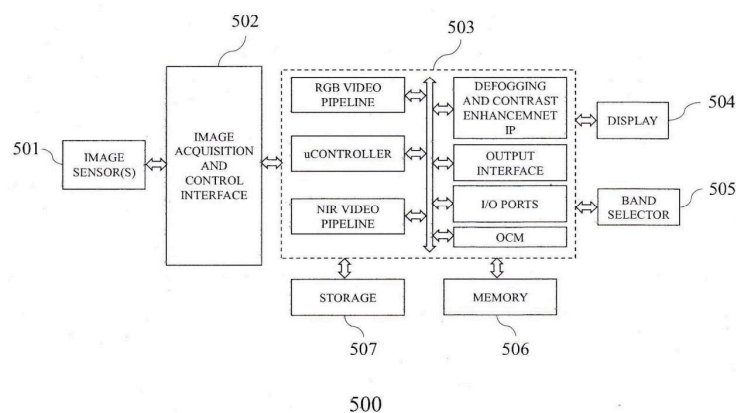


## "REAL-TIME FOG REMOVAL SYSTEM AND ITS METHOD THEREOF"

**Prof. Brajesh Kumar Kaushik, Department of Electronics and Communication Engineering**

**Prof. Balasubramanian Raman, Department of Computer Science and Engineering**

**Prof. Gaurav Sharma and Mr. Rahul Kumar**



## DESCRIPTION

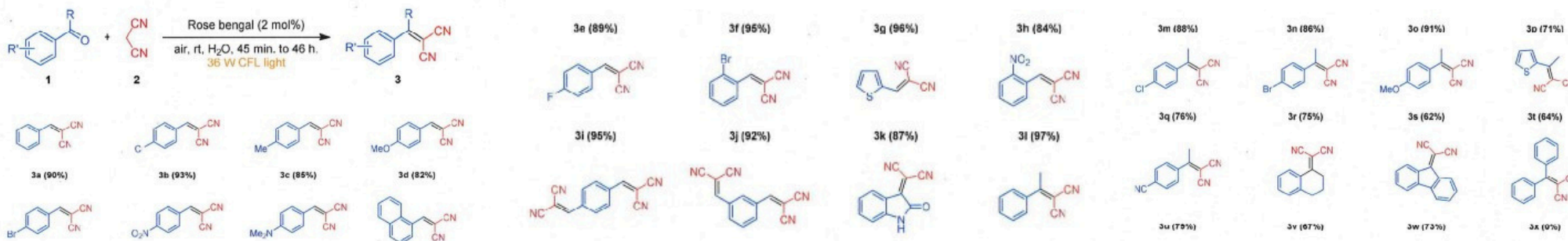
**Keywords:** Infrared band, pixel sharing-based system, wide electromagnetic spectrum, dehazing/defogging, in-camera processing.

The present invention provides a visible and near-infrared band's deep learning and pixel sharing-based system and method for image and video dehazing. It successfully restores hazy/foggy images with a wide range of haze/fog conditions. Unlike the prior art; the proposed invention utilized a wide electromagnetic spectrum for imaging from 400nm to 1400nm wavelength and performed dehazing/ defogging in the entire range (visible and NIR bands). For this task, a data-driven approach is developed to learn appropriate features from the input image sequences. The spatial multiscale features are extracted using completely separable ID layers that allow pipeline stage insertion to enhance timing performance and reduce the learning weights and memory requirements. This invention requires less execution time yet produces high perceptual quality haze-free images. In addition, it is highly suitable for FPGA/ASIC implementation; consequently, it can be used for in-camera processing.

## "A METHOD FOR PHOTOCATALYZED KNOEVENAGEL CONDENSATION"

Prof. K R Justin Thomas, and Mr. Anupam Das

Department of Chemistry



## DESCRIPTION

**Keywords:** Organo photocatalyzed Knoevenagel, Knoevenagel condensation reaction, carbonyl compounds and malononitrile.

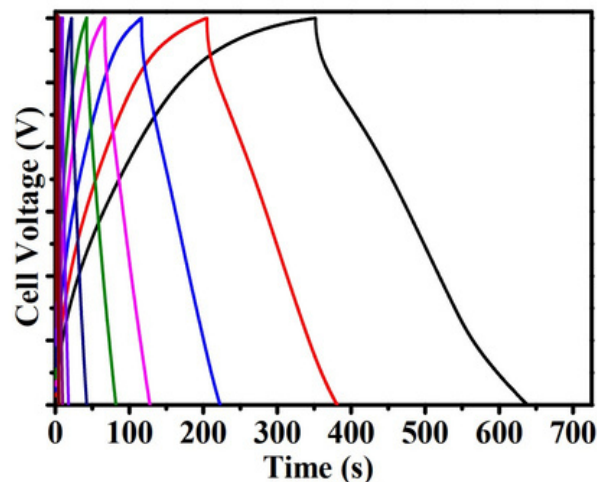
The present invention relates to a method for organo photocatalyzed Knoevenagel condensation which is applicable for both aldehyde and ketone derivatives. The invention provides sustainable and greener method for Knoevenagel condensation reaction between carbonyl compounds and malononitrile under rose bengal photosensitized condition. All the reactions work well at room temperature and in an aqueous medium with a wide range of functional group tolerance.



**"A ONE-POT SYNTHESIS METHOD OF HETEROATOM(S)-DOPED POROUS REDUCED GRAPHENE OXIDE AS ELECTRODE MATERIAL BY THE REDUCTION OF GRAPHENE OXIDE FOR THE FABRICATION OF HIGH VOLTAGE AQUEOUS SYMMETRIC SUPERCAPACITOR"**

**Prof. Anil Kumar, and Mr. Ikrar Ahmad**

**Department of Mechanical and Industrial Engineering**



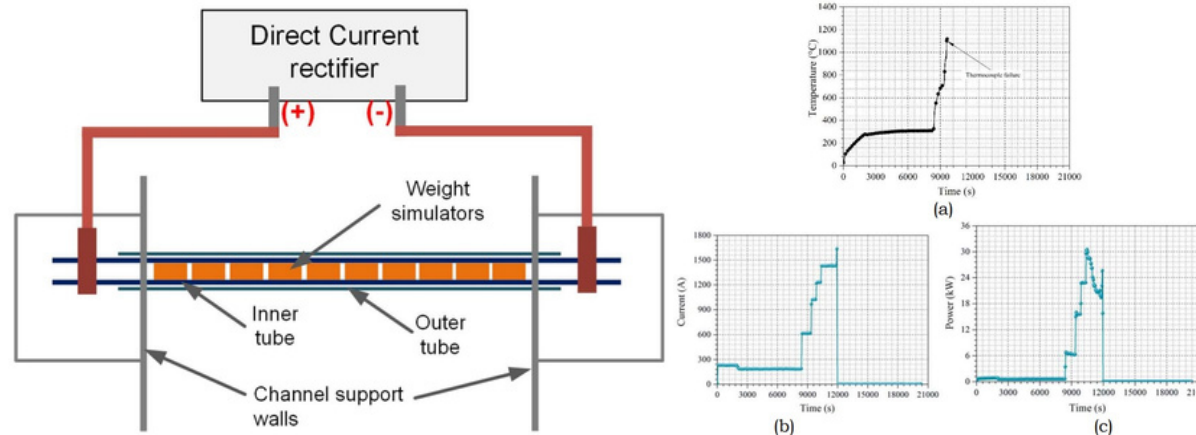
## DESCRIPTION

**Keywords:** One-pot fabrication, heteroatom(s)-doped porous, graphene oxide, greener protocols.

The present invention relates to a one-pot fabrication method of heteroatom(s)-doped porous reduced graphene oxide as electrode material by the reduction of graphene oxide (GO) using natural biomolecule(s) as reducing agent/dopant following greener protocols.

## "A MODULAR END-COOLER OF RESISTIVELY HEATED TUBE"

Prof. Andallib Tariq, and Mr. Ankit Rajkumar Singh  
Department of Mechanical and Industrial Engineering



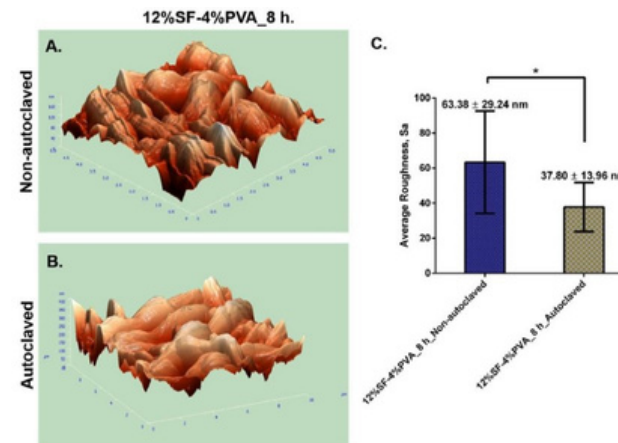
## DESCRIPTION

**Keywords:** Modular end-cooler, copper tube, stainless-steel tube, excessive heating.

The present invention relates to a modular end-cooler of the resistively heated tube. The modular end-cooler of resistively heated tube comprises copper tube 1 as outer shell and inner tube 2 made of stainless steel characterized in that inner tube is subjected to electrical heating by passing high current with the help of a direct current rectifier and the ends of the inner tube are connected to the rectifier using a copper clamp and a copper bus bar wherein the inside space of the inner tube is occupied with the weight simulators and surfaces of the inner tube near both clamps are subjected to excessive heating. The external groove 3 facilitates gas flow inside the inner tube. The cooling water inlet 4 and cooling water outlet 5 have cooling water flows into the cylindrical shell from the stainless-steel tube and gets flooded inside the interior of the outer shell and leaves from the exit port.

## "LOW COST, AUTOCLAVABLE AND MULTIFUNCTIONAL BIOMATERIAL BASED NANOFIBROUS PERMEABLE HANGING CELL CULTURE INSERT AND FABRICATION THEREOF"

**Prof. P. Gopinath, and Mr. Vinay Kumar and Mr. Soumyadeep Basak**  
**Department of Biosciences and Bioengineering**



## DESCRIPTION

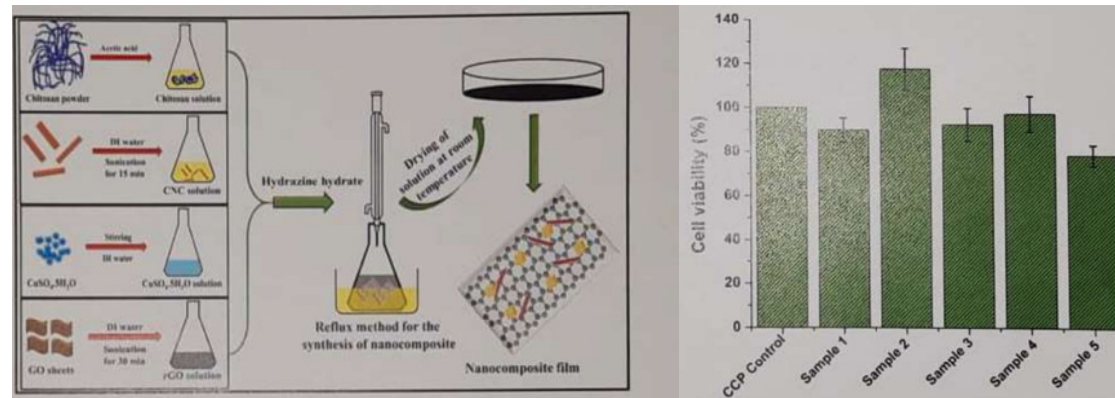
**Keywords:** Autoclavable, low-cost multifunctional biomaterial-based nanofibrous, tri-culture studies, cell migration and adhesion, toxicity testing, in-vitro model.

The present invention relates to an autoclavable, reusable, low-cost multifunctional biomaterial-based nanofibrous hanging permeable cell culture insert and fabrication thereof. It also relates to the process of fabrication of the biomaterial-based nanofibrous hanging permeable cell culture insert. The hanging cell culture insert of the present invention which employs a nanofibrous biomaterial-based membrane is low-cost, has varying pore sizes, and is easy to manufacture by a simple process involving few steps and using low-priced starting materials. The insert can be utilized in a wide variety of applications such as co-culture studies, tri-culture studies, cell migration and adhesion, toxicity testing, in-vitro model of angiogenesis, cell invasion assay and tissue engineering applications.

## "A COPPER OXIDE BASED CELLULOSE MODIFIED CHITOSAN BIONANOCOMPOSITE FILM AND ITS METHOD OF SYNTHESIS THEREOF"

**Prof. Kaushik Pal, and Ms. Nidhi Pal**

**Department of Mechanical and Industrial Engineering**



### DESCRIPTION

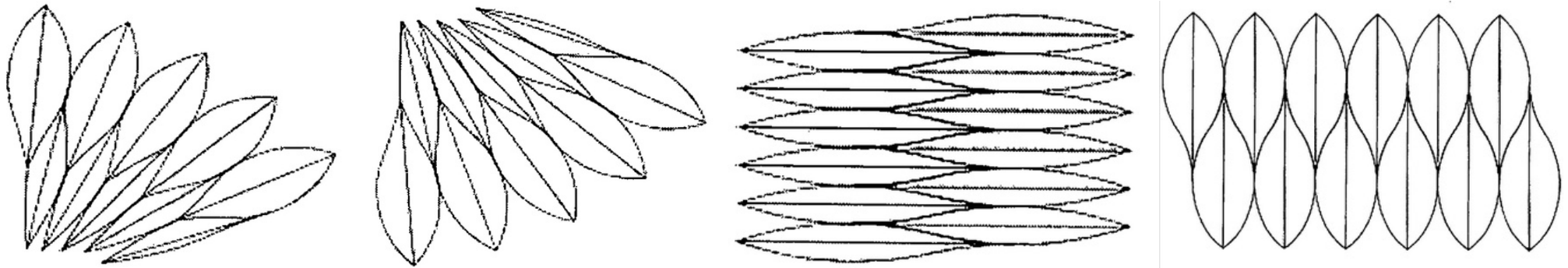
**Keywords:** Bio-nanocomposite films, CuO nanoparticles, chitosan polymer matrix, reduced graphene oxide, cellulose nanocrystals.

The present invention relates to a bio-nanocomposite film and the method of synthesis of a bio-nanocomposite film comprising (a) CuO nanoparticles, (b) rGO, (c) CNC, and (d) chitosan polymer matrix. The bio-nanocomposite films are based on a biodegradable polymer matrix, carbon-based nanofiller, and antibacterial nanoparticles. Copper oxide (CuO) nanoparticles are synthesized with reduced graphene oxide (rGO) embedded with cellulose nanocrystals (CNC) incorporated in the chitosan-based polymer matrix. The bio-nanocomposite film has good biocompatibility and mechanical strength.



## "SOFT ACTUATOR FOR ROBOTIC MANIPULATION AND LOCOMOTION"

**Prof. P M Pathak, Yunus Pirjade, Ian Wilfred Noronha, J M Yang and Ms. Garima**  
**Department of Mechanical and Industrial Engineering**



### DESCRIPTION

**Keywords:** Soft actuator, human-like interaction, pneumatic power supply, on-field applications.

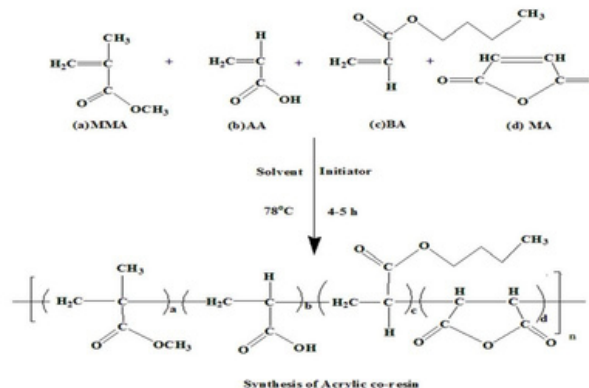
The present invention relates to a soft actuator to be used in interface with mechanical systems for achieving flexibility at present in nature. It aims to have a human-like interaction of mechanical systems with the objects to be handled. The actuator includes a flexible bellow structure attached to the pneumatic power supply, which is capable of air supply and removal simultaneously. The elastic chambers which form the flexible bellow structure inflate like balloons when air is supplied to it. The actuator finds on-field applications in inspection, search and rescue, manufacturing, and medical field.



## " A WATER BASED INK FORMULATION FOR MAGENTA PIGMENT APPLICATION FOR ELONGATED ENGRAVED CELLS ON ROTOGRAVURE PRINTING CYLINDER"

Dr. Yuvraj Singh Negi, Dr. Anurag Kulshreshtha, Brahma Prakash and Sauraj Singh

Department of Polymer and Process Engineering



## DESCRIPTION

**Keywords:** Water-based ink, magenta pigment, cross-linking, adhesion and fast drying, water-based ink, acrylic acid, butyl acrylate, methylmethacrylate and Maleic Anhydride

The present invention relates to water-based ink formulation for rotogravure printing ink medium and pigmented ink. The invention provides a formulation of water-based ink basically for magenta pigment and the use of additives for increasing the cross-linking while printing and improving the adhesion and fast drying. In this invention, we formulated the water-based ink with the use of acrylic acid, butyl acrylate, methylmethacrylate and Maleic Anhydride as monomers.

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[adii@iitr.ac.in](mailto:adii@iitr.ac.in)

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Patent No.: 521629

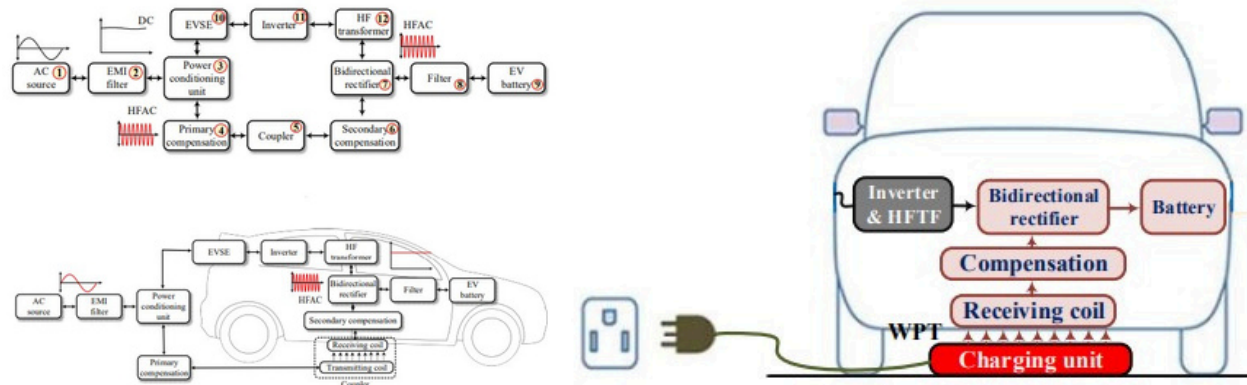
Application No.: 202211059665



# "A HYBRID BIDIRECTIONAL CONDUCTIVE INDUCTIVE ELECTRIC VEHICLE (EV) BATTERY CHARGER APPARATUS WITH MAXIMUM CONVERTER UTILIZATION"

**Dr. Deepak Ronanki and Harish Karneddi**

**Department of Hydro and Renewable Energy.**



## DESCRIPTION

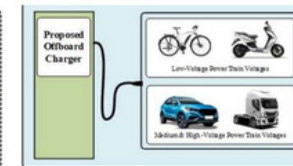
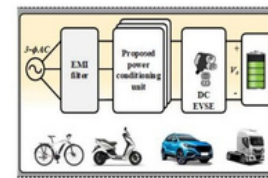
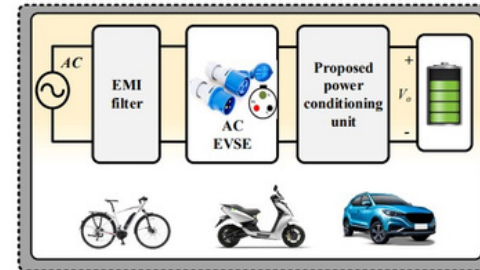
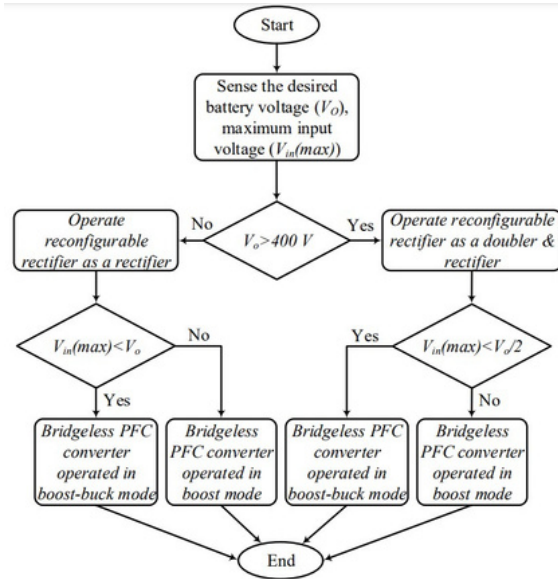
**Keywords:** Electric vehicle (EV), wireless power transfer (WPT), Common bidirectional converters, gallium nitride (GaN) devices, AC-HFAC converter.

The current invention pertains to an electric vehicle (EV) consisting of conductive and wireless power transfer (WPT) charging to recharge the battery. This charger configures common bidirectional converters on the offboard and onboard with gallium nitride (GaN) devices. The front-end converter is configured to operate as an AC-HFAC converter for WPT charging and conductive charging, and the same is reconfigured as a power factor correction (PFC) stage. A common onboard rectifier is used for conductive and WPT battery charging modes. The onboard converter is reconfigured as the DC-HFAC converter, and the offboard power conditioning unit is operated as HFAC to AC converter during WPT and DC-AC during conductive charging for the vehicle to grid (V2G), vehicle to vehicle (V2V) power transfer. EVSE is designed to change the conduction paths corresponding to the charging mode automatically.

**"A UNIVERSAL BRIDGELESS RECONFIGURABLE BATTERY CHARGER WITH WIDE OUTPUT VOLTAGE RANGE"**

**Dr. Deepak Ronanki and Harish Karneddi**

**Department of Hydro and Renewable Energy**



**DESCRIPTION**

**Keywords:** Electric vehicle (EV), wireless power transfer (WPT), Common bidirectional converters, gallium nitride (GaN) devices, AC-HFAC converter.

The present invention relates to a universal bridgeless reconfigurable battery charger with a wide output voltage range. The proposed charger provides a wide range of DC voltage at the output terminals, ranging from 250 V to 850 V, to preserve existing EVs' legacy and provide a charging facility for next-generation EVs. This charger facilitates the desired voltage to all EVs from the universal input voltage. Due to the bridgeless configuration, the proposed charger efficiently provides a wide output voltage range with a smooth transition.