

**FORM 2**

THE PATENTS ACT, 1970

(39 of 1970)

&

The Patent Rules, 2003

**PROVISIONAL SPECIFICATION**

(See sections 10 & rule 13)

**1. TITLE OF THE INVENTION**

**SMART HELMET EQUIPPED WITH WIRELESS CHARGING AND A DYNAMIC  
SCREEN DISPLAY**

**2. APPLICANT (S)**

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**3. PREAMBLE TO THE DESCRIPTION**

**PROVISIONAL SPECIFICATION**

The following specification particularly describes the invention.

# SMART HELMET EQUIPPED WITH WIRELESS CHARGING AND A DYNAMIC SCREEN DISPLAY

## TECHNICAL FIELD

5 [0001] The present invention relates to a wearable helmet capable of wireless charging with the vehicle and equipped with a dynamic screen display.

## BACKGROUND

10 [0002] Background description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[0003] According to government statistics, more than 20 million two wheelers were sold in India making it one of the world's largest two-wheeler producing nations in the world.  
15 Correspondingly, India manufactures around 30 million helmets for protecting its riders, construction site workers and for fire and safety departments. However, even though the helmet remains one of the oldest safety accessories, little innovation has been brought to it over the years to enable its further utility and even today its sole utility is to just protect the wearer.

20 [0004] Chinese patent publication CN204969651 provides - The utility model belongs to the technical field of novel energy equipment, especially, relate to an adopt multi - functional safety helmet of solar energy power supply, this adopt multi -functional safety helmet of solar energy power supply, include: the fan, the connecting axle, the motor, the brim of a hat, the motor cabinet, the connecting piece, the searchlight, the charging wire, the  
25 solar energy safety helmet, the battery, the rope is connected to the solar energy transformation device, the shock attenuation piece, the clearance lamp, solar energy safety helmet front end is provided with the brim of a hat, the motor passes through the motor cabinet is fixed on the brim of a hat, the fan passes through the connecting axle with the motor is connected, the utility model discloses rational in infrastructure, with strong points,  
30 the safety helmet covers has solar panel, relies on solar energy to supply with searchlight and fan work, is provided with the clearance lamp simultaneously, improves the security of workman's night work, has extensive application prospect, is suitable for popularization and application.

[0005] Korean Patent publication provides - The electronic helmet (20) comprising an integrated electronic system disposed in the helmet body (22) and the helmet body is provided. In a typical embodiment, the electronic system can provide a number of useful features to the wearer, the operation from the wireless remote control unit 26. Components of the electronic system are sufficiently small and rugged for use in the helmet, the helmet ensures lightweight durability. In addition, the components are arranged to fulfill the space with respect to the helmet in order to provide a uniform load distribution to improve the overall balance and satisfaction. In a typical embodiment of the invention, the helmet body and, because the outer vessel 30 of the light, of the light of the inner container mounted in the outer vessel, a cavity is defined between the outer container and the inner container. Wherein the inner container comprises a suitable material in order to provide effective RF shielding from the electronic system for the wearer. For example, the inner vessel may comprise a carbon fiber coated with nickel in order to provide RF shielding. When the helmet is worn, wherein the helmet body includes an impact absorbing structure disposed between the inner container and the wearer's head.

[0006] The present invention overcomes the problems of the existing solutions and provides much needed customizability for charging and communication modes. The present invention uses wireless charging for charging the secondary cells as well.

## **OBJECTIVE OF THE INVENTION**

[0007] Accordingly, the objective of the present invention is to devise a Smart helmet equipped with wireless charging and a dynamic screen display. This design is highly suitable for personalized advertisement and emergency alerts by government, food, grocery, and packages delivery companies and related organizations.

## **SUMMARY OF THE INVENTION**

[0008] The proposed embodiment includes helmet or add-on to the helmet with following components: wireless charging features with a safety lock on the side, a customizable communication module on the side, display screen(s) on the helmet.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

[0009] The accompanying drawings are included to provide a further understanding of the present disclosure, and are incorporated in and constitute a part of this specification. The drawings illustrate exemplary embodiments of the present disclosure and, together with  
5 the description, serve to explain the principles of the present disclosure.

[0010] In the figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label with a second label that distinguishes among the similar components. If only the first reference label is used in the specification, the description is  
10 applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

[0011] Figure 1 describes the overview of the proposed Smart helmet System in accordance with an embodiment of the present disclosure.

[0012] Figure 2 describes the communication protocol for the Smart helmet System in  
15 accordance with an embodiment of the present disclosure.

[0013] Figure 3 show cases the proposed embodiment of Smart Helmet with wireless charging in accordance with an embodiment of the present disclosure.

## **DETAILED DESCRIPTION**

[0014] The following is a detailed description of embodiments of the disclosure  
20 depicted in the accompanying drawings. The embodiments are in such detail as to clearly communicate the disclosure. However, the amount of detail offered is not intended to limit the anticipated variations of embodiments; on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the present  
25 disclosure as defined by the appended claims.

[0015] In the following description, numerous specific details are set forth in order to provide a thorough understanding of embodiments of the present invention. It will be apparent to one skilled in the art that embodiments of the present invention may be practiced without some of these specific details.

[0016] If the specification states a component or feature “may”, “can”, “could”, or  
30 “might” be included or have a characteristic, that particular component or feature is not required to be included or have the characteristic.

[0017] All publications herein are incorporated by reference to the same extent as if each individual publication or patent application were specifically and individually indicated

to be incorporated by reference. Where a definition or use of a term in an incorporated reference is inconsistent or contrary to the definition of that term provided herein, the definition of that term provided herein applies and the definition of that term in the reference does not apply.

5    **[0018]**       In some embodiments, the numerical parameters set forth in the written description and attached claims are approximations that can vary depending upon the desired properties sought to be obtained by a particular embodiment. In some embodiments, the numerical parameters should be construed in light of the number of reported significant digits and by applying ordinary rounding techniques. Notwithstanding that the numerical ranges and parameters setting forth the broad scope of some embodiments of the invention are approximations, the numerical values set forth in the specific examples are reported as precisely as practicable. The numerical values presented in some embodiments of the invention may contain certain errors necessarily resulting from the standard deviation found in their respective testing measurements.

10   **[0019]**       As used in the description herein and throughout the claims that follow, the meaning of “a,” “an,” and “the” includes plural reference unless the context clearly dictates otherwise. Also, as used in the description herein, the meaning of “in” includes “in” and “on” unless the context clearly dictates otherwise.

15   **[0020]**       Groupings of alternative elements or embodiments of the invention disclosed herein are not to be construed as limitations. Each group member can be referred to and claimed individually or in any combination with other members of the group or other elements found herein. One or more members of a group can be included in, or deleted from, a group for reasons of convenience and/or patentability. When any such inclusion or deletion occurs, the specification is herein deemed to contain the group as modified thus fulfilling the written.

20   **[0021]**       Figure 1 describes the overview of the proposed Smart helmet System in accordance with an embodiment of the present disclosure. Proposed Smart Helmet will have three key components – Display Screen(s), Data-logger with communication modes, microcontroller, and Wireless charging.

25   **[0022]**       In an embodiment, the smart helmet System requires Smart Helmet to be connected with Mobile/Web Application and Cloud/Server/Database to achieve remote control to display the message in the Display Screen(s). Proposed embodiment works on three types of communication mode: WiFi module, Bluetooth module, and Printed-circuit board (PCB) and hence, the design of the Smart Helmet will be customized as per users

requirements. WiFi module is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. It is with integrated TCP/IP protocol stack that can give any microcontroller (attached to Data-logger) access to WiFi network. Similarly function may be achieved by Bluetooth module, which is also designed for transparent wireless serial communication. Once it is paired to a Bluetooth device such as smart phones and tablet, it communicates with Display Screen.

[0023] Additionally, similar functionality can be achieved by a PCB module, which includes a GSM chip and antenna, data mobile sim, and an optional GPS chip to provide access to network. Communication mode or channel is necessary to make Display Screens dynamic and remotely controlled by a Mobile or Web Application.

[0024] Display Screens will be used for showing dynamic messages and advertisements. Proposed embodiment has one or more different size of rectangle or curved display LED or TFT screens, providing enough customizability. Display Screens can be customized as per user preferences at the bottom or the back of the helmet. Number of Display Screens, size, shape can also be customized.

[0025] Figure 2 describes the communication protocol for the Smart helmet System in accordance with an embodiment of the present disclosure.

[0026] Wireless charging is based on the principle of Inductive charging where both helmet and the charger will have a coil of wire inside them. Helmet has rechargeable batteries that will power Display Screens and Data-logger. These rechargeable batteries will be charged by the charger attached to a helmet docking area of the 2-wheeler. An embodiment of an helmet docking area can placed on the outer shell of the fuel tank of a motorcycle or placed on a plain surface above the tail light of the vehicle. Further, in an embodiment the docking area shall be connected to the battery pack of the vehicle for retrieving current necessary for charging the helmet. The docking area shall have the charger and the coil of wire inside them and once the helmet is locked onto the docking area, the contact of the coils of the docking area and the helmet shall help in the process of charging. To achieve full functionalities of the proposed invention, an embodiment of the proposed design will also use an authentication process wherein the helmet docking area will recognize a certain configuration/s of helmets for charging. In addition to the above functions, an embodiment of the invention shall also have a safety lock to feature enhanced security and ensure security against unauthorized access or theft. Safety lock can be a feature with authorization via SMS (OTP), keypad based system or based any other authentication modes or devices.

[0027] Data logger will have hardware components that will include printed circuit board (PCB), communication modes, proposed microcontroller and other necessary electrical components to interact with mobile/web application and Display Screens smoothly. Sense wires and communication ports will be used to communicate seamlessly. Data logger may also have antennas for network and accessing location and multiple ports.

[0028] Figure 3 showcases the proposed embodiment of Smart Helmet capable of wireless charging in accordance with an embodiment of the present disclosure.

[0029] As shown in Figure 3, in an embodiment, the smart helmet includes display screens (1) and (2). The smart helmet further includes charging port and coil (3). The smart helmet further includes a communication module (4).

[0030] As used herein, and unless the context dictates otherwise, the term “coupled to” is intended to include both direct coupling (in which two elements that are coupled to each other or in contact each other) and indirect coupling (in which at least one additional element is located between the two elements). Therefore, the terms “coupled to” and “coupled with” are used synonymously. Within the context of this document terms “coupled to” and “coupled with” are also used euphemistically to mean “communicatively coupled with” over a network, where two or more devices are able to exchange data with each other over the network, possibly via one or more intermediary device.

[0031] While some embodiments of the present disclosure have been illustrated and described, those are completely exemplary in nature. The disclosure is not limited to the embodiments as elaborated herein only and it would be apparent to those skilled in the art that numerous modifications besides those already described are possible without departing from the inventive concepts herein. All such modifications, changes, variations, substitutions, and equivalents are completely within the scope of the present disclosure. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims.

[0032] It should be apparent to those skilled in the art that many more modifications besides those already described are possible without departing from the inventive concepts herein. The inventive subject matter, therefore, is not to be restricted except in the spirit of the appended claims. Moreover, in interpreting both the specification and the claims, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms “comprises” and “comprising” should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Where the specification claims refers

to at least one of something selected from the group consisting of A, B, C ....and N, the text should be interpreted as requiring only one element from the group, not A plus N, or B plus N, etc.

**[0033]** The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the appended claims.

**[0034]** While the foregoing describes various embodiments of the invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof. The scope of the invention is determined by the claims that follow. The invention is not limited to the described embodiments, versions or examples, which are included to enable a person having ordinary skill in the art to make and use the invention when combined with information and knowledge available to the person having ordinary skill in the art.

**[0035]** In the description of the present specification, reference to the term “one embodiment,” “an embodiment,” “an example,” “an instance,” or “some examples” and the description is meant in connection with the embodiment or example described. The particular feature, structure, material, or characteristic included in the present invention, at least one embodiment or example. In the present specification, the term of the above schematic representation is not necessarily for the same embodiment or example. Furthermore, the particular features structures, materials, or characteristics described in any one or more embodiments or examples in proper manner. Moreover, those skilled in the art can be described in the specification of different embodiments or examples are joined and combinations thereof.

**[0036]** All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.



[0037] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0038] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

**FOR LITHION POWER PRIVATE LIMITED**



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**Dated: 27<sup>th</sup> June, 2019**

**ABSTRACT**

**SMART HELMET EQUIPPED WITH WIRELESS CHARGING AND A DYNAMIC  
SCREEN DISPLAY**

5 The present disclosures relates to smart helmet equipped with wireless charging and a dynamic screen display. The proposed invention includes helmet or add-on to the helmet with following components: wireless charging features with a safety lock on the side, a customizable communication module on the side, display screen(s) on the helmet.

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