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Production of electric motorcycle to augment effectiveness of engine moreover eradicate effluence

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Abstract- The fuel prices in India and just about the world is growing day by day thus there is a incredible necessitate to search for an alternative to conserve these natural resources. Promoting use of vehicles can eliminate CO2 emission and the lubrication oil.In present scenario electric motorcycle will help to solve the major problems of fuel and pollution.The motorcycle has the most feasible electric power system battery,mounted on the vehicle during all durations There is no doubt that the emission of carbon-dioxide from an automobile exhaust is a concern for the increasing rate of global warming. Thus electric motorcycle has the battery and thus provide required voltage to run the motor.This type of technique is to reduce the running cost and increasing the running efficiency of the vehicle.For controlling speed of the motor, an accelerator is given.This type of technique is to reduce the running cost and increasing the running efficiency of the vehicle.Thus electric motorcycle can become a vital and cheap alternative against the use of automobile and thus its production is essential.The aim of present study is production of electric motorcycle to augment effectiveness of engine moreover eradicate effluence.

Keywords: Motorcycle,production,electric,fuel

I. INTRODUCTION

A motorcycle reacts further hurriedly to proviso enter than a car, but is also further susceptible to external forces, similar to lopsided motorway facades or crosswinds.A motorcycle is also less perceptible than a car due to its narrower silhouette, and proposes far less fortification by divulging its proviso to other traffic and the elements. All these risks can be dealed with through cram, instruction, and practice. Motorcycling is a inimitable experience. Compared to a car, you don't take a seat in a motorcycle, you befall part of it. Not as a unreceptive driver, but as an dynamic rider arcing into a twine of even corners, playing along with the pace of the road; jerky, gathering speed, and slowing down with exactitude.You'll learn how to perk up your riding skills and mental strategies, so you can be a safer, more alert rider. The multifaceted environment that looks out for you, and sustains the conception that, as the Motorcycle Safety Foundation says, "Safe riding is as much a dexterity of the eyes and mind as it is of the hands and feet." Lucratively piloting a motorcycle is a much more concerned assignment than driving a car.Whether you ride to and from work or conjure the camaraderie of a group ride on the weekend, motorcycling connects all your wits and produces an revitalizing sense of liberty.Along with that freedom comes accountability.All states require some form of license approval representing you seize a minimum level of skill and knowledge. This booklet and other motorcycle publications can assist arrange you to be flourishing. You might also deem taking a formal hands-on training course, even if your state doesn't necessitate that you inclusive one.Motorcycling requires a fine sense of balance and a heightened sense of wakefulness and place amidst other roadway users.

II. LITERATURE REVIEW

One of the mainly victorious was Charles Metz, who established a company in Waltham, Massachusetts, to produce racing bicycles.As the 19th century illustrates to a slam; copious creators were demanding to plan latest gasoline-powered vehicles, both four-wheeled and two-wheeled. Consistent with a few financial records, Metz emotionally involved an internal combustion engine to a bicycle to form a lick bike with which to coach his racing team. His advance led to the first mass-production motorcycle, known as the Orient-Aster. Metz commenced the motorbike in Boston in 1900 at the first evidenced motorcycle race in the United States.The familiarize finished a five-mile course in only seven minutes. After that few years adaged the concern of two brands that would overlook the U.S. motorcycle market for half a century.The Indian Motorcycle Company, produced in 1901, was for numerous decades the leading motorcycle producer in the world. Indian's rival, Harley Davidson, founded in 1903, has experienced far greater success and now ranks as the iconic name in American-made motorcycles. It didn't take long for the versatile vehicles to catch the attention of the military and law enforcement.Even though the creative company went out of business in 1953, other companies are still efforting to revive the Indian brand. During World War I, before the era of radio communications, couriers distributed essential messages by motorcycle. In both world wars, the vehicles' speed and manoeuvrability made them naturals for exploration and reconnaissance missions. And on the home front, police departments embarked on to rely on motorcycles to take the helm city traffic. Although their popularity with the military and police, motorcycles have traditionally had a "bad boy" image. After World War II, fidgety young men, counting some veterans looking for the companionship they had notorious in the military, took to the road with fellow motorcyclists who liked to outing and party hard. With terrifying emblems and names for instance Pagans,forbids, and Warlocks, they sophisticated a insubordinate icon. A few gangs, for example the disreputable Hell's Angels, had exceedingly revealed confrontations with the law. A 1953 film, The Wild One, starring Marlon Brando and anchored in an tangible biker street party and riot in California,did a great deal to fuel the proscribe stereotype. All through the 1960s, a a large amount more nourishing image of motorcyclists materialized, gratitudes to one of the the majority triumphant publicity crusades of the entire instance.In 1962, Japanese producer Honda commenced an poster with the jingle "You convene the nicest people on a Honda" that attributed sights of housewives, juvenile links, and a close relative and teenager riding Honda motorcycles.The ad, which ran in diverse versions for ten years, completed motorcycles a upright earnings of just about township transportation and advanced Honda's sales in the United States by a massive 500 percent. At the similar instance, once insubordinate motorcyclists were mended downwards to weddings, relations, and vocations.Indian's competitor, Harley Davidson, founded in 1903, has practised far greater triumph and now ranks as the iconic name in American completed motorcycles. It didn't acquire long for the adaptable vehicles to clutch the consideration of the military and law enforcement, many never lost their love of motorcycles. Now grown-up or older, in a few suitcases went away, they have the time and money to chase their leisure pursuit again.In reality, the standard age of Harley-Davidson owners is resembling 50.Consistent with the Motorcycle Industry Council, the percentage of owners aged 50 and older tripled between 1985 and 2002. (As then, there also has been a rush forward in younger riders, many being engrossed by the sportier models of bikes.) The demographics have malformed in erstwhile traditions as well. Bikers today are just as apt to be deep-rooted doctors, lawyers, and bankers as they are to be proletarian workers. Within the motorcycling commune, this new rear of riders is known as RUBs (Rich Urban Bikers), or Rubbies. Women, counting grandmas and great-grandmas, also are getting in on the fun.According to the Motorcycle Industry Council, almost a quarter of all riders are women, as are one in ten of all motorcycle owners.

III. ELECTRIC MOTORS

It will materialize afterward that in a few motors the elements of the machine accountable for the excitation and for the energy renovating functions are distinctive and obvious.In the d.c. motor, for example, the excitation is afforded either by everlasting magnets or by Weld coils draped around evidently definited extrapolative Weld poles on the motionless element, while the conductors on which force is developed are on the rotor and completed with current via descending brushes.Electric motors are so greatly a part of everyday life that we rarely bestow them a second thought. When we start up an electric drill,for example, we assertively suppose it to lope speedily up to the accurate speed, and we do not query how it knows What speed, and we do not question how it discerns what speed to run at, or how it is that once sufficient energy has been drawn from the provide to fetch it up to speed, the power drawn descends to a very low level. When we situate the drill to exertion it draws more power, and when we terminate the

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power drawn from the mains trims downs automatically, without involvement on our part. The meek motor, consisting of nothing more than an deal of copper coils and steel laminations, is evidently rather a clever energy converter, which warrants somber consideration.By ahead a basic indulgent of how the motor works, we will be able to realize its potential and its limitations. Almost all motors utilize the force which is exerted on a current hauling conductor placed in a magnetic Weld. The force can be confirmed by placing a bar magnet near a wire carrying current,but anyone demanding the experiment will possibly be disappointed to ascertain how delicate the force is, and will probably be left conjecturing how such an unhopeful consequence can be used to build effective motors.We will perceive that so as to build the most of the mechanism, we necessitate to position a very strong magnetic Weld, and build it intermingle with many conductors,each carrying as much current as possible.We will also see later that although the magnetic Weld (or 'excitation') is indispensable to the working of the motor, it acts only as a catalyst, and every of the mechanical output power appears from the electrical supply to the conductors on which the force is extended .In many motors,however, there is no such precise physical distinction between the'excitation' and the 'energy-converting' parts of the machine, and a single stationary winding serves both purposes. Nevertheless, we will find that recognizing and unraveling the excitation and energy-converting functions is forever obliging in indulgent how motors of all types operate.Recurring to the matter of force on a single conductor, we will first glance at what concludes the magnitude and direction of the force, When a current-carrying conductor is located in a magnetic Weld, it occurrences a force.Experiment illustrates that the magnitude of the force depends directly on the current in the wire, and the strength of the magnetic Weld,and that the force is greatest when the magnetic weld is perpendicular to the conductor.In the set-up, the source of the magnetic weld is a bar magnet, which produces a magnetic weld.The conception of a 'magnetic weld' contiguous a magnet is an intangible idea that aids us to get nearer to seizes with the inexplicable occurrence of magnetism: it not only affords us with a expedient pictographic way of picturing the directional upshots, but it also tolerates us to enumerate the'strength' of the magnetism and hence consents us to envisage the various effects produced by it.The dotted lines are referred to as magnetic flux lines, or simply flux lines. They designate the direction along which iron filings (or small steel pins) would line up themselves when placed in the weld of the bar magnet. Steel pins have no initial magnetic weld of their own, so there is no reason why one end or the ther of the pins should point to a particular pole of the bar magnet. However, when we locate a compass needle (which is itself a permanent magnet) in the weld we unearth that it aligns. In the upper half of the, the S end of the diamond shaped compass settles closest to the N pole of the magnet, while in the lower half, the N end of the compass asks for the S of the magnet which conventionally are taken as positively directed from the N to the S pole of the bar magnet. However, if we were to glance at the flux lines inside the magnet, we would hit upon that they were unremitting, with no 'start' or 'finish'. The internal flux lines have been misplaced for the sake of intelligibility, but a very similar weld pattern is produced by a circular coil of wire haulage a d.c. where the continuity of the flux lines is lucid. Magnetic flux lines always shape closed paths, as we will make out when we come across at the 'magnetic circuit', and represent a parallel with the electric circuit, in which the current is also a continuous quantity.

Magnetic flux density in conjunction with screening direction, the flux plots also get across information about the greatness of the magnetic weld. To pull off this, we pioneer the plan that between every pair of flux lines (and for a given depth into the paper) there is a same 'quantity' of magnetic flux. Some people have no impenetrability with such a conception, while others concept while others stumble on that the conception of quantifying something so intangible symbolizes a solemn cerebral challenge. But whether the loom looks like evident or not, there is no denying of the realistic value.We entitle magnetic flux,and it shows the ways us next to the very significant scheme of magnetic flux density (B).When the flux lines are shut together, the 'tube' of flux is flattened into a smaller space, whereas when the lines are advance separately the same tube of flux has more inhalation space.The flux density (B) is simply the flux density is a vector quantity, and is therefore often written inbold type: its magnitude is specified and its direction is that of the widespread flux lines at each

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point.Near the top of the magnet for example, the flux density will be large (because the flux is packed in into a small area), and pointing upwards, whereas on the equator and far out from the body of the magnet the flux density will be small and directed downwards.It will be seen anon that so as to produce high flux densities in motors,the flux pays out most of its life surrounded by distinct 'magnetic circuits' through of iron or steel, within which the flux lines sizeable equivalently to seize full advantage of the available area. It hangs about to stipulate units for quantity of flux, and flux density. In the SI system, the unit of magnetic flux is the weber (Wb). If one weber of flux is strewned equivalently across an area of $1m^2$ perpendicular to the flux, the flux density is evidently one weber per square metre.It reconciled that one weber per square meter would hence forward be known as one tesla (T), in honour of Nikola Tesla who is generally endorsed with inventing the induction motor. The prevalent exploit of B (measured in tesla) in the design stage of all types of electromagnetic gadget means that we are persistently striked a chord of the importance of tesla; but at the same time one has to concede that the obsolete unit did have the advantage of passing on directly what flux density is, i.e. flux divided by area.In the motor world we are unlikely to stumble upon more than a few milliwebers of flux, and a small bar magnet would perhaps only generate a few microwebers. On the other hand, values of flux density are typically around 1 T in most motors, which is a manifestation of the reality that even though the quantity of flux is small, it is also extend over a small area.We now approach again to the production of force on a current-carrying wire placed in a magnetic weld, as revealed by the setup.The direction of the force is at right angles to both the current and the magnetic flux density.With the flux density horizontal and to the right, and the current flowing out of the paper, the force is vertically upward. If either the weld or the current is reversed,the force acts downwards, and if both are reversed, the force will loiter upward. We necessitate to articulate the force in terms of the product of the current and the magnetic flux density, and this turns out to be very uncomplicated when we work in SI units.The force on a wire of length l, carrying a current I and exposed to a uniform magnetic flux density B throughout its length is given by the simple expression F =BIL where F is in newtons when B is in tesla, I in amperes, and L in metres. This is a humorously simple formula, and it may come as a exposure to some readers that there are no constants of proportionality involved.The straightforwardness is not a fluke, but stalks from the fact that the unit of current (the ampere) is actually definited in terms of force.Strictly,only applies when the current is perpendicular to the weld. If this stipulation is not met, the force on the conductor will be less; and in the tremendous case where the current was in the same direction as the weld, the force would plummet to zero.However, every sensible motor designer makes out that to dig up the best out of the magnetic weld it has to be perpendicular to the conductors, and so it is secure to presuppose in the ensuing argument that B and I are always perpendicular.It will be unspecified that the flux density and current are mutually perpendicular, and this is why, although B is a vector quantity (and would usually be denoted by bold type), we can jump down the bold memo because the direction is couched and we are only interested in the magnitude.The reason for the very low force detected in the experiment with the bar magnet is exposed .To attain a high force, we must have a high flux density, and a lot of current. The flux density at the ends of a bar magnet is low, perchance 0.1 tesla, so a wire hauling 1 amp will occurrence a force of only 0.1 N/m (approximately 100 gm wt). Since the flux density will be perhaps 1 cm across the end face of the magnet, the total force on the wire will be only 1 gm. This would be barely demonstrable,and is too low to be of any use in a upright motor.So how is more force attained ?The first step is to achieve the highest possible flux density.This is pulled off by designing a 'good' magnetic circuit, and is confered next.Secondly, as many conductors as possible must be horded in the space where the magnetic weld exists, and each conductor must spread as much current as it can without heating up to a dangerous temperature.In this way, imposing forces can be achieved from discreetly sized devices, as anyone who has tried to stop an electric drill by grasping the chuck will testify.So far we have assumed that the source of the magnetic weld is a permanent magnet.This is a convenient starting point as all of us are familiar with magnets, even if only of the fridge-door variety. But in the majority of motors, the working magnetic weld is produced by coils of wire haulage current, so it is appropriate that we fritter some time looking at how we put together the coils and their associated iron 'magnetic circuit' so as to produce high magnetic welds which then interact with other current-carrying conductors to produce force, and hence rotation. First, we look at the simplest possible case of the magnetic Weld surrounding an isolated long straight wire carrying a steady current.The flux lines form circles concentric with the wire, the Weld strength being greatest close to the wire. As might be expected, the weld strength at any point is directly proportional to the current. The caucus for determining the direction of the weld is that the positive direction is taken to be the direction that a right-handed coiled must be rotated to budge in the direction of the current. One evident way to augment the flux density is to boost the current in the coil, or to append more turns. We come across that if we double the current, or the number of turns, we double the total flux, thereby doubling the flux density everywhere.We quantify the ability of the coil to produce flux in terms of its magnetomotive force (MMF).The MMF of the coil is simply the product of the number of turns (N) and the current (I), and is thus expressed in ampere-turns. A given MMF can be gained with a large number of turns of thin wire carrying a low current, or a few turns of thick wire carrying a high current: provided that the product NI is constant, the MMF is the identical.

IV. BATTERIES

At the same time as the battery electrochemically renovates chemical energy into electric energy, it is not matter, as are combustion or heat engines, to the limitations of the Carnot cycle uttered by the second law of thermodynamics. A battery is a apparatus that alters the chemical energy encloseed in its vigorous materials straight into electric energy by means of an electrochemical oxidation-reduction (redox) reaction.In the case of a rechargeable system, the battery is revived by a reversal of the process. This type of reaction engages the transfer of electrons from one material to another through an electric circuit. In a nonelectrochemical redox reaction, such as tarnishing or burning,the transfer of electrons takes place directly and only heat is engrossed.

Batteries, therefore, are proficient of having higher energy adaptation efficiencies.While the term ''battery'' is often used, the basic electrochemical unit being referred to is the ''cell.'' A battery consists of one or more of these cells, connected in series or parallel,or both, depending on the beloved output voltage and capacity.The cell consists of three major components:**1.**The anode or negative electrode—the plummeting or fuel electrode—which gives up electrons to the external circuit and is oxidized during the electrochemical reaction.**2.** The cathode or positive electrode—the oxidizing electrode—which accepts electrons from the external circuit and is reduced during the electrochemical reaction. **3.** The electrolyte—the ionic conductor—which offers the medium for transfer of charge, as ions, inside the cell between the anode and cathode. The electrolyte is typically a liquid, such as water or other solvents, with dissolved salts, acids, or alkalis to pass on ionic conductivity.Some batteries use solid electrolytes, which are ionic conductors at the operating temperature of the cell.The most advantageous combinations of anode and cathode materials are those that will be lightest and bestow a high cell voltage and capacity. Such combinations may not always be practical, however,due to reactivity with other cell components, polarization, difficulty in handling, high cost, and other deficiencies.

In a practical system, the anode is picked with the following properties in mind: efficiency as a reducing agent, high coulombic output (Ah/ g), good conductivity, stability, ease of fabrication, and low cost. Hydrogen is striking as an anode material, but obviously, must be encloseed by some means, which effectively condenses its electrochemical equivalence.Basically, metals are mainly used as the anode material. Zinc has been a principal anode because it has these flattering properties.Lithium, the lightest metal, with a high value of electrochemical equivalence, has befalled a very striking anode as suitable and compatible electrolytes and cell designs have been enlarged to control its activity. The cathode must be an efficient oxidizing agent, be stable when in contact with the electrolyte, and have a useful working voltage.Oxygen can be used directly from ambient air being drawn into the cell, as in the zinc / air battery.However, most of the common cathode materials are metallic oxides. Other cathode materials, such as the halogens and the oxyhalides, sulfur and its oxides, are used for special battery systems.The electrolyte must have good ionic conductivity but not be electronically conductive, as

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this would cause internal short-circuiting.Other important characteristics are non reactivity with the electrode materials, little alteration in properties with alteration in temperature, safety in handling, and low cost.Mainly electrolytes are aqueous solutions,but there are imperative exemptions as, for example,in thermal and lithium anode batteries,where molten salt and other nonaqueous electrolytes are used to evade the reaction of the anode with the electrolyte.Physically the anode and cathode electrodes are electronically isolated in the cell to thwart internal short-circuiting, but are encased by the electrolyte.In practical cell designs a separator material is used to detach the anode and cathode electrodes mechanically.The separator, however, is holey to the electrolyte in order to keep up the preferred ionic conductivity. In some cases the electrolyte is immobilized for a nonspill design. Electrically conducting grid structures or materials may also be appended to the electrodes to condense internal resistance.

The cell itself can be built in many shapes and configurations—cylindrical, button, flat, and prismatic and the cell components are designed to put up the particular cell shape.The cells are sealed in a variety of ways to avert leakage and dry-out. Some cells are endowed with venting devices or other means to allow accumulated gases to escape.Suitable cases or containers, means for terminal connection and labeling are added to inclusive the fabrication of the cell and battery. Electrochemical cells and batteries are acknowledged as primary (nonrechargeable) or secondary (rechargeable), depending on their capability of being electrically recharged. Within this classification, other classifications are used to make out particular structures or designs.In primary cells or Batteries,these batteries are not capable of being easily or effectively recharged electrically and,hence, are discharged once and discarded.Many primary cells in which the electrolyte is contained by an absorbent or separator material (there is no free or liquid electrolyte) are termed ‘‘dry cells.’’ The main battery is a expedient, generally inexpensive, lightweight source of packaged power for portable electronic and electric devices, lighting, photographic equipment, toys, memory backup, and a host of other applications,giving freedom from utility power.The general advantages of primary batteries are good shelf life, high energy density at low to moderate discharge rates,little, if any, maintenance, and ease of use.Even though large high capacity primary batteries are used in military applications, signaling, standby power, and so on, the vast majority of primary batteries are the familiar single cell cylindrical and flat button batteries or multicell batteries using these component cells.In Secondary or Rechargeable Cells or Batteries,These batteries can be recharged electrically, after discharge, to their original condition by passing current through them in the opposite direction to that of the discharge current. They are storage apparatus for electric energy and are known also as ‘‘storage batteries’’ or ‘‘accumulators.’’ The applications of secondary batteries fall into two main categories:

1. Those submissions in which the secondary battery is used as an energy-storage device, generally being electrically connected to and charged by a prime energy source and delivering its energy to the load on demand.Exemplars are automotive and aircraft systems,emergency no-fail and standby (UPS) power sources, hybrid electric vehicles and stationary energy storage (SES) systems for electric utility load leveling.**2.**Those applications in which the secondary battery is used or discharged really as a primary battery, but recharged after use rather than being discarded. Secondary batteries are employed in this approach as, for example, in moveable consumer electronics, power tools, electric vehicles, etc., for cost savings (as they can be recharged rather than reinstated), and in applications necessitating power drains beyond the capability of primary batteries. Secondary batteries are represented by high power density, high discharge rate, flat discharge curves, and good low-temperature performance.Their energy densities are generally lower than those of primary batteries. Their charge preservation also is poorer than that of most primary batteries, although the capacity of the secondary battery that is lost on standing can be restored by recharging.Some of the metal/ air batteries are representative of this type of battery.In reserve batteries,In these primary types, a key component is separated from the rest of the battery prior to activation. In this state, chemical deterioration or self-discharge is fundamentally eliminated,and the battery is capable of long-term storage.Usually the electrolyte is the component that is isolated. In further schemes, for instance the thermal battery,

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the battery is immobile until it is heated, melting a solid electrolyte, which then becomes conductive.The reserve battery design is used to meet tremendously long or environmentally severe storage requirements that cannot be met with an ‘‘active’’ battery designed for the same performance characteristics. These batteries are used, for example, to set free high power for relatively short periods of time, in missiles, torpedoes, and other weapon systems.

Fuel cells, like batteries, are electrochemical galvanic cells that alter chemical energy directly into electrical energy and are not subject to the Carnot cycle limitations of heat engines.Fuel cells are alike to batteries apart from that the active materials are not an integral part of the device (as in a battery), but are fed into the fuel cell from an external source when power is desired. The fuel cell diverges from a battery in that it has the capability of producing electrical energy as long as the active materials are fed to the electrodes (assuming the electrodes do not fail).The battery will close down to produce electrical energy when the limiting reactant stored within the battery is consumed.He electrode materials of the fuel cell are inert in that they are not frenzied during the cell reaction, but have catalytic properties which enhance the electro reduction or electro oxidation of the reactants (the active materials).The anode active materials utilized in fuel cells are usually gaseous or liquid (compared with the metal anodes generally used in most batteries) and are fed into the anode side of the fuel cell. As these materials are more like the conventional fuels used in heat engines, the term ‘‘fuel cell’’ has become popular to illustrate these devices. Oxygen or air is the predominant oxidant and is fed into the cathode side of the fuel cell.Fuel cells have been of interest for over 150 years as a potentially more efficient and less polluting means for converting hydrogen and carbonaceous or fossil fuels to electricity compared to conventional engines. A well known application of the fuel cell has been the use of the hydrogen/oxygen fuel cell, using cryogenic fuels, in space vehicles for over 40 years.Use of the fuel cell in terrestrial applications has been developing slowly, but recent advances has revitalized interest in air-breathing systems for a variety of applications, including utility power, load leveling, dispersed or on-site electric generators and electric vehicles.Fuel cell technology can be classified into two categories.**1.** Direct systems where fuels, such as hydrogen, methanol and hydrazine, can react directly in the fuel cell.

2. Indirect systems in which the fuel, such as natural gas or other fossil fuel, is first converted by reforming to a hydrogen-rich gas which is then fed into the fuel cell.Fuel cell systems can take a number of configurations depending on the combinations of fuel and oxidant, the type of electrolyte, the temperature of operation, and the application,etc.

More recently, fuel cell technology has budged towards portable applications, historically the domain of batteries, with power levels from less than 1 to about 100 watts, blurring the distinction between batteries and fuel cells. Metal/ air batteries, particularly those in which the metal is periodically replaced, can be considered a ‘‘fuel cell’’ with the metal being the fuel. Similarly, small fuel cells, now under development, which are ‘‘refueled’’ by replacing an ampule of fuel can be regarded as a ‘‘battery.’’Now that small to medium size fuel cells may suit competitive with batteries for portable electronic and other applications. Information on the larger fuel cells for electric vehicles, utility power, etc can be achieved.

The operation of a cell during discharge,when the cell is connected to an external load, electrons flow from the anode, which is oxidized, through the external load to the cathode, where the electrons are acknowledged and the cathode material is reduced. The electric circuit is completed in the electrolyte by the flow of anions (negative ions) and cations (positive ions) to the anode and cathode, respectively. The discharge reaction can be written, assuming a metal as the anode material and a cathode material such as chlorine (Cl_2), as follows:

Negative electrode: anodic reaction (oxidation, loss of electrons)

$Zn \rightarrow Zn^{2+} + 2e$

Positive electrode: cathodic reaction (reduction, gain of electrons)

$Cl_2 + 2e \rightarrow 2Cl^-$

Overall reaction (discharge):

$Zn + Cl_2 \rightarrow Zn^{2+} + 2Cl^- (ZnCl_2)$

V. AC ADAPTER

AC adapters are utilized with electrical devices that entail power but do not restrain internal components to originate the

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required voltage and power from mains power.The internal circuitry of an external power supply is very similar to the design that would be used for a built-in or internal supply.An AC adapter, AC/DC adapter, or AC/DC converter is a type of external power supply, often attached in a case similar to an AC plug. Erstwhile widespread names cuddle plug pack, plug-in adapter, adapter block, domestic mains adapter, line power adapter, wall wart, power brick, and power adapter.Adapters for battery-powered equipment may be described as chargers or rechargers . External power supplies are used both with equipment with no other source of power and with battery-powered equipment, where the supply, when plugged in, can sometimes charge the battery over and above powering the equipment.Employ of an external power supply consents to portability of equipment powered either by mains or battery without the added bulk of internal power components, and makes it unnecessary to produce equipment for use only with a specified power source; the same device can be powered from 120 VAC or 230 VAC mains, vehicle or aircraft battery by using a different adapter.Originally, most AC/DC adapters were linear power supplies, including a transformer to renovate the mains electricity voltage to a lower voltage, a rectifier to convert it to pulsating DC, and a filter to smooth the pulsating waveform to DC, with residual ripple variations small enough to abscond the powered device unaffected. Range and weight of the apparatus was largely dogged by the transformer, which in turn was determined by the power output and mains frequency. Ratings over a few watts completed the appliances too large and heavy to be physically supported by a wall outlet.The output voltage of these adapters varied with load; for equipment requiring a more stable voltage, linear voltage regulator circuitry was appended.Losses in the transformer and the linear regulator were considerable; efficiency was relatively low, and significant power degenerated as heat even when not driving a load.

Early in the twenty-first century, switched-mode power supplies (SMPSs) became almost omnipresent for this purpose. Mains voltage is corrected to a high direct voltage driving a switching circuit, which encloses a transformer operating at a high frequency and outputs direct current at the desired voltage.The high-frequency ripple is more easily filtered out than mains-frequency.The high frequency allocates the transformer to be small, which condenses its losses; and the switching regulator can be much more efficient than a linear regulator. The result is a much more efficient, smaller, and lighter device.Safety is makes certain, as in the older linear circuit, because there is still a transformer which electrically segregates the output from the mains.A linear circuit must be intended for a specific, narrow range of input voltages (e.g., 220–240 VAC) and must utilize a transformer appropriate for the frequency (usually 50 or 60 Hz), but a switched-mode supply can work efficiently over a very wide range of voltages and frequencies; a single 100–240 VAC unit will touch almost any mains supply in the world.However, unless very cautiously intended and using appropriate components, switching adapters are more likely to not pass than the older type, due in part to complex circuitry and the use of semiconductors.Unless designed well, these adapters may be easily scratched by overloads, even transient ones, which can come from lightning, brief mains overvoltage (sometimes caused by an incandescent light on the similar power circuit failing), component degradation, etc. A very common mode of failure is due to the use of electrolytic capacitors whose equivalent series resistance (ESR) enlarges with age; switching regulators are very sensitive to high ESR (the older linear circuit also used electrolytic capacitors, but the effect of degradation is much less dramatic). Well-designed circuits reimburse mind to the ESR, undulate current rating, pulse operation, and temperature rating of capacitors.

External AC adapters are widely used to power small or portable electronic devices. The benefits comprise Safety.External power adapters can free product designers from worrying about some safety issues. Much of this style of equipment uses only voltages low enough not to be a safety hazard internally, although the power supply must out of necessity use dangerous mains voltage.This is particularly relevant for equipment with lightweight cases which may break and expose internal electrical parts.Heat reduction – Heat reduces reliability and longevity of electronic components, and can cause sensitive circuits to become inaccurate or malfunction. A separate power supply removes a source of heat from the apparatus. Electrical noise reduction – Because

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radiated electrical noise falls off with the square of the distance, it is to the manufacturer's advantage to alter potentially deafening AC line power or automotive power to "clean", filtered DC in an external adapter, at a safe distance from noise-sensitive circuitry.Weight and range reduction – Eradicating power components and the mains connection plug from equipment powered by rechargeable batteries reduces the weight and size which must be carried.Ease of replacement – Power supplies are further flat to collapse than other circuitry due to their exposure to power spikes and their internal generation of waste heat. External power supplies can be reinstated quickly by a user without the need to have the powered device repaired.Configuration versatility – Externally powered electronic products can be used with different power sources as needed (e.g. 120VAC, 240VAC, 12VDC, or external battery pack), for convenient use in the field, or when traveling.Simplified product inventory, distribution, and certification – An electronic product that is sold and used worldwide must be power-driven from a wide range of power sources, and must meet product safety regulations in many jurisdictions, usually requiring expensive certification by national or regional safety agencies such as Underwriters Laboratories or Technischer Überwachungsverein. A solo description of a apparatus may be used in many markets, with the different power requirements met by different external power supplies, so that only one version of the device need be manufactured, stocked, and tested.Constant voltage is produced by a specific type of adapter used for computers and laptops. These types of adapters are normally recognized as eliminators.

VI. PRODUCTION OF ELECTRIC MOTORCYCLE

The depleting reserves of fossil fuels made the engineers and scientists to look for other energy sources. In adding, the environmental decay due to the combustion of fuel is alarming and justifies the design of eco-friendly system. India is spending huge amount of foreign exchange to import crude oil. If we utilise battery for local conveyance, a large amount of money can be saved and we can also ensure pollution free environment and contribute to nation’s economy.

The design involves the calculation of power required to run a motor cycle at a known speed (say 20 km/h) and to develop a battery to produce the required power.Since additional attachments are to be mounted on the motorcycle cycle. Since the total motorcycle weight including rider is equal to 180 kg and rim diameter is 50 cm, the normal reaction acting on each tyre is equal to (90 x 9.81) Newton each. Friction force acting on the tyre $F = \mu N$, $F = 0.3 \times 882.9$,$F = 264.87$ N.Torque required $T = F \times r$,$T= 264.87 \times 0.25$,$T= 66.22$ Nm.Speed calculations are $\omega = v \div r$, $\omega = (20 \times 1000) \div (0.25 \times 3600)$,$\omega = 22.22$ rad/sec ,$\omega = (2 \pi N) \div 60$, $N = (60 \times \omega) \div (2\pi)$,$N = (60 \times 22.22) \div (2\pi)$,$N = 196$ rpm. Power calculations are $P = (2 \pi N T) \div 60$,$P = (2 \pi \times 196 \times 66.22) \div 60$,$P = 1470$ W.We have to pick motor which can produce 1470 W afterward vehicle can run 20 km/h. Battery specification is Power = Voltage x Current ,$P = V.I$,$1470 = 24 \times I$,$I = 61.25$ Ah.Therefore consistent with the exceeding computations, to drive a motor of 1470 W, 120 V capacity; we pick 2 batteries of 60V, 60Ah.We attach these batteries in series to accomplish a voltage of 120 V as requisite by the motor.Time required to fully charging the battery is calculated. Power Supplied to Battery during AC Charging:AC Adapter Specification: 60V, 60 A ,$P = V.I$,$P = 60 \times 60$,$P = 3600$ W .Therefore the time required to charge the battery completely is: $t = 7200 \div 3600$,$t = 2$ hours .Hence, it is found that, the time required to charge the batteries completely is 2 hours.Two Lifepo4 battery with 60 V and 60 amp-hour rating are used .The selection of battery depends on its voltage, ampere and wattage rating etc. The total power of fully charged battery in two hours is 7200 Watt-hours.LAKC motor (Fig1) range of d.c. motors are wholly laminated with compensated shunt windings and comprises 4, and 6 pole machines.Output : 300 - 1300 kW Torque : 4000 – 23000. The production process involves fixing the different components to the frame of the motor cycle. The motor is fixed to the front wheel shaft with proper alignment so that the weights are perfectly balanced. A battery casing in which 2 Lifepo4 batteries of 60 V, 60Ah are fixed to frame and wirings are drawn from battery to motor so as to transmit power from battery to motor. Also wiring for speed control is also incorporated.

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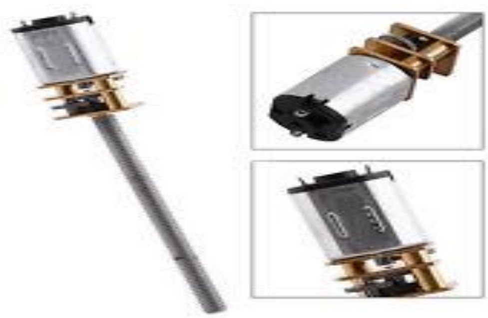

Fig1

An electrical signal accelerator (Fig2) works on the principle of Hall Affect generator, which produces speed controlling signals based on the rotation of the actuator.

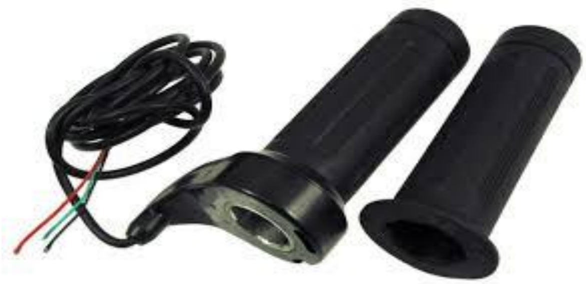

Fig2

Table 1 shows detail of components used in production of eletric motorcycle.

Item	Quantity
LAKC motor	1
Lifepo 4 batteries	2
AC adapter	1
Accelerator	1

Table 1

VII. CONCLUSION

This motorcycle is cheaper, simpler in construction & can be widely used for short distance travelling especially by school children, college students, office goers, villagers, postmen etc.Electric motorcycle is modification of existing motorcycle. It is suitable for both city and country roads, that are made of cement, asphalt, or mud. It is very much fit for young, aged, handicap people and caters the need of economically poor class of society. It can be operated throughout the year.The most important feature of this motorcycle is that it does not consume valuable fossil fuels thereby saving crores of foreign currencies.It is ecofriendly & pollution free , s it does not have any emissions eliminate lubrication oil.Moreover it is noiseless and can be recharged with the AC adapter .

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