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Implementation of Power Generation System by Foot Print using Arduino

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***Abstract*—In all commercial and private sectors the electric power provides electricity. To built today's society the electrical power plays the prominent role, From the street lights to display light. The electricity is less in weight, easier to distribute and easy to transport. When a force by the foot is applied on piezo electric crystals which is placed on hard rubber, the force generated is changed into the form of electrical energy. This changed form of electrical energy is non another than the voltage which is stored in lead acid battery, it is connected to inverter. The inverter will convert the 12V DC to 230V AC used to activate the battery, hence the connected bulb glows. One part of embedded is very important at this situation. It is generally defined as computer system which basically has the timing constraints.**

***Index Terms*— Arduino Nano, Piezoelectric Sensors, LED, Battery.**

I. INTRODUCTION

This proposal is to save the coal mine power for larger use and to use the power generated by the human footprint. As we all know the world is running with advanced technology and power is need for every single machine. Hence this power will be useful for household needs, for small public needs and excreta. In the highly populated countries like India , China people always travel for the needs on the roads , on the buses , on the Railways too. They also stand in a queue in various places like in temples, in the billing sections , in the market. By this foot power we can store the energy and can use for other needs of our life. And also the human or the bio energy which is wasted and if this is utilised for some or the other use will be a great invention. This will be the great invention for the crowded countries. This proposal will be the low cost , durable , environmental acceptable application with a great use.

II. PROBLEM STATEMENT

In small slow stages as the days are being passed The countries residents is being increasing. Hence the need for the power is even increasing day by day. The misuse ofenergy is also being increased in different manners like vampire power or standby power i.e. energy is wasted when the electronic devices which are not in use are kept plugged in and many more like such. So the major solution to get rid of these problem is to reform this wasted energy back. Now-a-days as we can see that the usage of gadgets, electronic devices etc. are being increased as the technology is developed. As the generation of power with the use of conventional methods is lacking there is a need for disparate methods of generation of power. We as a human wasting lots of energy in our daily activities

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so in order to overcome to get rid of this problem we use this Work to generate the power using human footsteps. So here in this Work we apply a force on the board and this applied force is converted into voltage and thus the power gets generated. So by using this energy saving method we are generating power

III. EXISTING MODEL

NTT's Shoe is a power generator. NTT, a Japanese telecoms behemoth, has developed advanced shoes that produce electricity from kinetic energy generated by walking. The shoe, which resembles an orthopedic sandal, is strong enough to produce 1.2W, which is enough to charge an iPod. When weight is placed on water cushioned soles and water sloshes on the tiny mills to create electric power, this occurs. Each pair of shoes comes with a tiny generator that can create a reasonable amount of energy.

A. Nano Power Shoes

Fig 1 – Nano Power Shoe

Each stride forward cost us roughly 20 watts in the form of heat. The University of Wisconsin-research Madison's team created fantastic stiletto heels. Viscous liquid with microscopic metallic droplets make up the shoe. Small droplets flowed into the pedestal under them as the user walked. Reverse electro hydration is a process that uses pressure to generate energy. This technique is low-cost and ecologically beneficial.

B. Motion on Dance Floor Generates Green Electricity

To create the green energy that powers the Sustainable Dance Club in Rotterdam, the Netherlands, the Dutch architecture firm Doll worked with the environmental organisation Envi. Kinetic energy is generated whenever Dance Clubs Hit the European Scientific Journal, July 2018 Issue, Volume 14, Issue 21 ISSN: 1857-7881 (print) e - ISSN 1857-7431 322 Ground.

C. Generate Power using Footsteps by a Spring Mechanism

Plates, springs, and connecting rods are the primary components in this operation. The connecting rods are pulled down when the plate is squeezed by the spring. Then, on the rails, a DC motor is attached, resulting in the creation of electrical power. To create electricity, they employ kinetic energy conversion indoors and solar technology outdoors. Kinetic energy has been shown to be inefficient in the field since it takes more energy to develop and sustain than it can produce.

D. NTT's Electricity Generating Shoe

The company NTT, whose goal is to use the power generation system in practice as early as 2010, hopes to improve the device so that it can generate enough electricity to operate a mobile phone that uses twice as much energy as digital music. The tanks are connected by a pipe and at each step the pressure forces the water to flow from one tank to the other through the pipe. The resulting water streams feed a turbine for generating electricity can be stored in the battery or accessed through a cord. The output power of the prototype is low and only enough for a digital music player shoes are not capable of storing energy, but they are certainly suitable for making devices on the road. Finally, NTT expects to increase shoe power to 3 watts.

IV. PROPOSED MODEL

The electricity generated by each footstep is stored and used for additional purposes in the suggested systems. When the foot steps on the shoe that is meant to create energy, the energy is preserved in a Lead Acid Battery, which is then connected to an inverter and a power source. In this manner, power is used in order to preserve electricity for small-scale usage. And it is here that the Arduino Nano comes into action. may provide less than five volts, and the circuit board may be unstable If we utilize more above 12 V, the voltage regulator may overheat, resulting in board damage. The Arduino Nano's suggested voltage range is 7 to 12 volts. VIN: When the Arduino Uno is powered via a USB connection or an external power supply is additionally attached, the input

voltage to the Arduino board is an external power source. And the resource is chosen for you automatically. Long-term creation of a new source of ecologically acceptable, low-cost power Energy as a replacement for the increasingly dwindling supplies of fossil fuels.

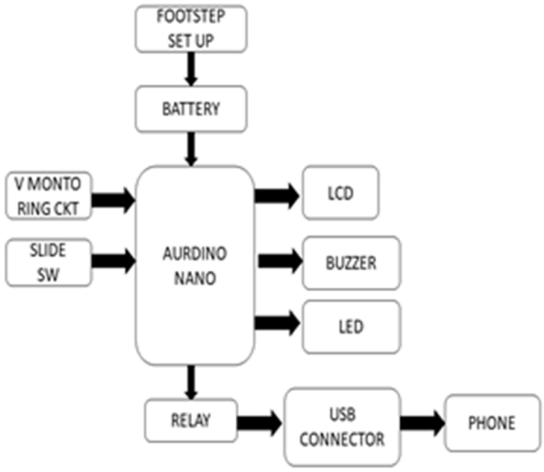

Fig 2 – Block diagram

A. Arduino Nano Broad

The Arduino Nano is a compact, full, breadboard-compatible board based on the AT-mega328P microcontroller (Arduino Nano 3.x). It performs functions similar to Arduino Demilune, but in a different packaging. It only lacks a DC power connector and uses a Mini B USB cord rather than a conventional USB cable. The Nano board is the first of a series of USB Arduino boards, and it serves as the platform's standard model. See Arduino Index for a comprehensive list of current, past, and heritage boards. Arduino index boards number of boards.

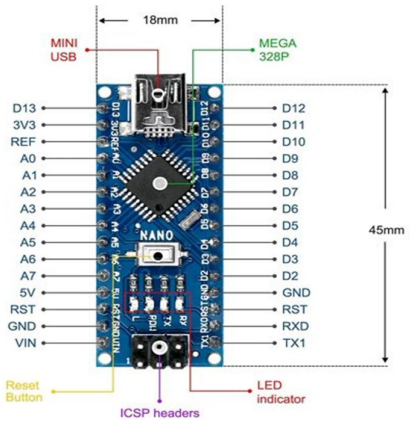

Fig - 3 Aurdino Nano

An external power supply or a USB connection are both used to power the Arduino Uno. Furthermore, the resource is chosen automatically. External power may be less than five volts, making the board unstable. If we utilise more above 12 V, the voltage regulator may get heated, resulting in board damage. The Arduino Nano's suggested voltage range is 7 to 12 volts. VIN: When utilising the Arduino board, the input voltage is an external power source rather than 5v from a USB connector or other regulated power source This pin can be used to deliver voltage or to access voltage if it is supplied through the power connection. 5V: This pin receives a controlled 5V from the board's regulator. The board may be powered by the board's DC power connection (7-12V), USB connector (5V), or VIN pin (7-12V). Energy is transformed from mechanical to electrical form. The Curie brothers discovered it in the 1880s. When a pressure (piezoelectric meaning pressure in Greek) is applied to a polarised crystal, a mechanics is produced. An electric charge is created by deforestation. A notable example is piezo microphones. This phenomenon, Acoustic pressure is converted into electricity via microphones.

B. Piezo Electric Sensor

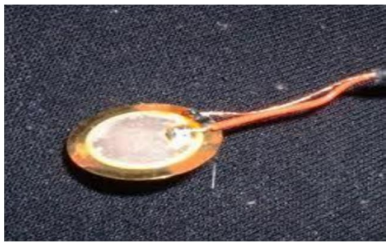

Fig 4 – Piezo Electric Sensor

Piezoelectric sensors are devices that employ the piezoelectric effect to monitor acceleration, pressure, strain, or force by converting them to an electrical charge.
The piezoelectric effect is a method of converting energy between mechanical and electrical forms. It was discovered in the 1880s by the Curie brothers. When the pressure (piezoelectric meaning pressure in Greek) is applied to the polarized crystal, a mechanics occurs. An electric charge is generated as a result of deformation. Piezo microphones are an excellent example. Acoustic pressure is converted into electricity via microphones. Christ's chosen period is likewise marked by constant polarization. Each cell in such structures is made up of an electric dipole, and each cell employs an electric dipole.
On purpose Electrets are solids with persistent electrical polarization. (These are essentially electrical analogues of magnets. In actuality, this little charge is soon dispersed by free charges from the surrounding environment drawn by the surface charges. Electrets are often utilized in microphones.

C. Light Emitting Diode (LED)

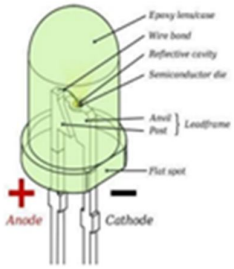

Fig –5 Light Emitting Diode

The acronym LED stands for Light Emitting Diode. It is nothing more than a collection of Semiconductors that emit light when an electric current passes through them.. Over the years, semiconductors Technology has reached great heights, light emitting devices have also been a part of it revolution and as a result, we now have LEDs that give better illumination with less power consumption.Early LEDs appeared in 1962 as practical electronic components. Low-intensity infrared (IR) light was emitted. [7] Remote control circuits, such as those used in a wide range of consumer gadgets, utilize infrared LEDs.
Unlike LEDs, incandescent lamps can be run internally on almost any electrical device, using AC or DC alternating current, and even at frequencies below 50 Hz when used by AC or pulsing DC. Will provide more stable lighting.

D. Battery

Fig -6 Battery

The Lead Acid battery is mostly utilized in PV systems because they are inexpensive and readily available all around the world. All of these batteries come in both sealed and wet cell versions. These lead acid batteries are extremely dependable due to their ability to withstand overcharging, discharging, and shock. All of these batteries feature a high electrolyte capacity, excellent charge acceptance, and minimal self-discharge. Computer Aided Design is also used to test lead acid batteries. These batteries are often used in UPS systems and inverters, and they have the ability to function in hazardous situations.. Primary (disposable or "disposable) Batteries are discarded after a single use because the electronic material The alkaline battery, which is often used in lights and a wide range of portable electronic devices, undergoes irreversible alteration upon discharge.

E. Liquid Crystal Display (LCD)

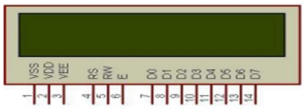

Fig –7 Light Crystal Display

A LCD display is a relatively simple module that is found in a wide range of equipment and circuits. The LCD (Liquid Crystal Display) is a type of electronic display that may be used in a variety of ways. Since LCD screens don't use phosphorus, they rarely suffer the burning of images in which an image is still displayed on the screen for long periods of time, for example, on a tablet, on a tablet, and on a flight schedule for an airline. But LCDs are susceptible to image perseverance.

LCD screen is more efficient and safer than CRT. Its low power consumption is more efficient than that of CRTs powered by electronic components. By 2008, annual sales of television LCD screens with CRT units exceeded sales worldwide, and CRTs have become obsolete for most purposes.

V. RESULTS

By using this Work we can generate the power with the help of footsteps of human.to develop this work we use Arduino board to which we connect the battery ,LCD, LED, Buzzer etc.… in order to generate power with help of footprints of human and The results acquired are shown below:

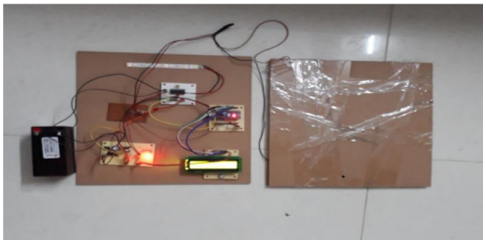

Fig - 8 Model Before Placing Footprint

When we place our feet on the board a force is applied. When we place the our foot print force on the board of the right side of the figure in which the piezo electric crystal is connected. Hence the battery can store the voltage in it through the of Arduino board. The piezo acts as a actuator, ac load to dc load is also happens. Hence the bulb glows by using the voltage from battery. Due to this applied force a voltage will be generated and the LED will turns ON due this generated voltage as shown in the figure below:

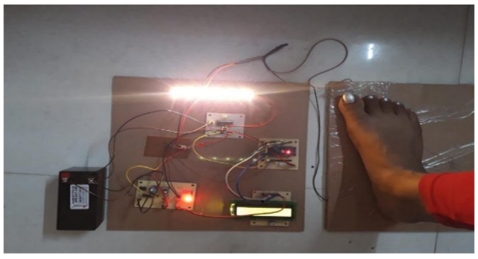

Fig - 8 Model After Placing Footprint

VI. Conclusion

Operation of the " Implementation of Power Generation System By Foot Print Using Arduino " Work AC and DC loads are used in rural energy applications. have been successfully tested and implemented and are the most cost-effective Energy solution for the general public This may be utilized for a variety of purposes in rural locations when electricity is scarce. total absent. Because we are a developing country, energy management is a huge concern for us. a large number of people. Using this Work, we can run AC and continuous current loads based on the applicable force Photovoltaic sensors.

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