Energy Conservation By Hybrid Conveyor Belt

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Abstract- *Aiming at solving the problem Energy conservation by Hybrid conveyor Belt, an objective to help reduce the movement of the hard copy paper within an organization and integrated various ,seemingly unrelated activities within an organization .The software is based on open technologies and web based, which is user - friendly and easy - to - use. The complete system works with a centralized back - end data base to the store the necessary structure information keyboard in by the user. The model has high application value in coal, ports, power, mine, metallurgy, chemical, and other industries. Application/Improvements: The design of energy efficient conveyor system model by controlling multiple drive units in industrial units.*

Keywords- Conveyor Loading Dynamics, Conveyor System, Energy Efficiency, Variable Speed Drive

I. INTRODUCTION

The project deal with the generation of electricity through solar panel.It is a important to know that the conveyor belt can also generate electricity through the mechanism that will generate force and the light will be on. We have investigated that the force and the generation is connected with each other. The structural design and the circuits that will run the system in the industry will be helpful for many workers who are working in the industry. We are trying to solve in the problem of the workers based condition terms in the which the work and the hazardous machines that are useful for the industries in production process but how they can be dangerous term for the works so the safety and security of the workers is also assured. Here the problems in the industry are the boilers that are used for much purpose in production process.

The boiler heating temperature has to be maintained properly if the proper care is not taken then the boiler can be harmful for the workers though it is beneficial for the company. The boiler temperature will be controlled with these circuits.

The belt conveyor is used for continuous transportation in modern production. It has the advantages of large capacity, long distance, low energy consumption, low freight, high efficiency, smooth operation, and convenient loading and unloading, and is suited to bulk-material transportation. It has become one of the three main industrial transportation modes along with automobiles and trains and has been widely used in coal, ports, electricity, power, mining, metallurgy, chemical, and other industries. The operation of the belt conveyor consumes much electricity. It has 41% of global electricity is provided by coal-fired power plants, and coal is one of the main sources of carbon dioxide emissions worldwide. It is therefore imperative to reduce the energy consumption of the belt conveyor system. There are two ways to reduce the energy use of the belt conveyor: one being to improve the performance of the equipment and the other being to optimize operation parameters (e.g., the belt speed). The transient operation dynamics of a conveyor belt while adjusting the speed of the belt conveyor and solved the time optimization problem of the speed adjustment.

II. POWER CONSUMPTION MODEL OF THE CONVEYOR SYSTEM

First of all solar panel will generate electricity and the battery will be charge hear also the battery can be charge through the transformer that is from electricity. rectifier , capacitor will be used. Here the clips will be connected for connection to the battery.when the battery is to charge through the solar the clips of solar will be connected and when the battery use to be charge though clips of the transformer will be connected to the battery. Here the transformer will receive the 230 volt input ac supply and will step down to 12 volt ac and after that the volt ac will convert to dc from bridge rectifier base diode circuit. The capacitor will convert the 12 volt dc supply to pure 12 volt dc .After that the clips are connect to the supply of transformer. The conveyor belt to dc motor connected to dc motor with gear will be used to increase to torque of the dc motor .The belt will be fitted on the mechanism. The belt will rotate according to supply received from the battery.In the between the generator say a dynamo will be attached while rotation with the dc motor the electricity will generate will be used for lighting the light of the factories where the worker will work. So here the mechanical force is convert into electrical energy this is a free cost of energy .After that the boiler needs to be controlled so hear controller circuit will be installed and the sensor will be connected and the light will act as load means the supply to the boiler will be shown. As soon as the temperature is

increase the sensor will pass command to the controller circuits and the circuits will cut off the supply to the boiler based load so for load as boiler circuit will cut off supply to the boiler based so for load as boiler we have used a light that means to indicate power is passing to the boiler. When the temperature is high the supply will cut off in the form of light off. This will save worker and the factory from damage even if in case improper maintenance and low seriousness have been made towards the boiler so in that case of emergency the temperature based controlling circuit will save the worker from damage.

III. COMPONANT REQUIED

i. **SOLAR PANNEL:** Solar panels are those devices which are used to absorb the sun's rays and convert them into electricity or heat.

ii. **PHOTOVOLTIC:** (PV) devices generate electricity directly from sunlight via an electronic process that occurs naturally in certain types of material, called semiconductors. ... PV devices can be used to power anything from small electronics such as calculators and road signs up to homes and large commercial businesses.

iii. **TRASFORMER:** A transformer consists of two electrically isolated coils and operates on Faraday's principal of “mutual induction”, in which an EMF is induced in the **transformers** secondary coil by the magnetic flux generated by the voltages and currents flowing in the primary coil winding.

iv. **RECTIFIER BRIDGE:** A Bridge rectifier is an Alternating Current (AC) to Direct Current (DC) converter that rectifies mains AC input to DC output. Bridge Rectifiers are widely used in power supplies that provide necessary DC voltage for the electronic components or devices.

v. **OUTPUT SMOOTHING:** In contrast, **output** methods **smooth** the effects of multiple sources of volatility for specific statutory requirements. By **definition**, input **smoothing** methods target specific sources of volatility, such as interest rate movements or. deviations from expected asset returns.

vi. **REGULATOR IC [78XX]: 78xx** (sometimes L78xx, LM78xx, MC78xx...) is a family of self-contained fixed linear voltage **regulator** integrated circuits. The **78xx** family is commonly used in electronic circuits requiring a regulated power supply due to their ease-of-use and low cost.

vii. **CAPACITOR FILTER:** A **capacitor**-input **filter** is a **filter** circuit in which the first element is a **capacitor** connected in parallel with the output of the rectifier in a linear power supply. The **capacitor** increases the DC voltage and decreases the ripple voltage components of the output.

viii. **DIODE:** A **diode** is a semiconductor device that essentially acts as a one-way switch for current. It allows current to flow easily in one direction, but severely restricts current from flowing in the opposite direction.

ix. **RESISTER:** A **resister** is one who resists, one who stands firm against something, refuses compliance or withstands temptation. ... **Resister** appears in the late fourteenth century from the Old French **word resister**, meaning hold out against. A resistor is an electrical component that resists the passage of electricity.

x. **CAPACITOR:** A **capacitor** is an electronic component that stores and releases electricity in a circuit. It also passes alternating current without passing direct current. A **capacitor** is an indispensible part of electronic equipment and is thus almost invariably used in an electronic circuit.

xi. **RECHARGABLE BATTERY: Rechargeable batteries** (also known as secondary cells) are **batteries** that potentially consist of reversible **cell** reactions that allow them to **recharge**, or regain their **cell** potential, through the work done by passing currents of electricity.

xii. **555TIMER IC:** The **555 timer IC** is a very cheap, popular and useful precision **timing** device which can act as either a simple **timer** to generate single pulses or long time delays, or as a relaxation oscillator producing a string of stabilised waveforms of varying duty cycles from 50 to 100%.

xiii. **MODES:** The **mode** of electromagnetic radiation describes the field pattern of the propagating waves. Electromagnetic **modes** are analogous to the normal **modes** of vibration in other systems, such as mechanical systems.

xiv. **CONVEYOR BELT:** A **belt conveyor** system consists of two or more pulleys (sometimes referred to as drums), with a closed loop of carrying medium—the **conveyor belt**—that rotates about them. ... The powered pulley is called the drive pulley while the unpowered pulley is called the idler pulley.

xv. **BELT ONVEYDC OTOROR SYSTEM:** Fixed Speed **Conveyor** **Belt** Systems

AC induction **motors are** ideal for **conveyor** systems that operate continuously in one direction. For **conveyor** systems where the load must be held in place or for vertical applications, there are a wide

range of AC **motors** with power-off activated electromagnetic brake.

xvi. **GENERATOR:** Electric **generator**, also called dynamo, any machine that converts mechanical energy to electricity for transmission and distribution over power lines to domestic, commercial, and industrial customers. **Generators** also produce **the** electrical power required for automobiles, aircraft, ships, and trains.

xvii. **LED:** In **the** simplest terms, a light-emitting diode (**LED**) is a semiconductor device that emits light when an electric current is passed through it. Light is produced when **the** particles that carry **the** current (known as electrons and holes) combine together within **the** semiconductor material.

IV. METHODOLOGY

Table no. 5.1 : Methodology

SR. NO.	DATE	WPRL COMPLETE IN %	WORK COMPLETE DATE
01	07.06.21	0%	COMPLETE SYNIPOSIS AND PPT
02	1ST WEEK OF SEPTEMBER	25%	FIND COMPENENT REQUARED FOR PROJECT
03	LAST WEEK OCTOMBER	50%	ASSEMBEL THE COMPONENT ON PCB
04	1ST WEEK OF APRIL	75%	CHECKIING IT RUNNING OR NOT OR ANY FAULT
05	LAST WEEK OF JUNE	100%	SUBMIT PROJECTOR OUR INCHARGE

V. WORKING OF PROJECT

First of all solar panel will generate electricity and the battery will be charged here also the battery can be charged through the transformer that is from electricity.

Transformer rectifies, capacitor will be used.Here the clips will be connected for connection to the battery.When the battery is to charge through the solar the clips of solar will be connected and when the battery need to be charged through the transformer the clips of transformer will be connected to the battery.

Here the transformer will receive the 230 volt input ac supply and will step down t 12 volt ac and after that the 12 volt ac will be converted to dc from bridge rectifier based diode circuits. The capacitor will convert the 12 volt dc supply to pure 12 volt dc.

After that the clips are connected to the supply of transformer. The conveyor belt the dc motors connected with gears will be used to increase the torque of the dc motor. The belt will be fitted on the mechanism. The belt will rotate according to the supply received from the battery.

In the between the generator say a dynamo will be attached while rotation with the dc motor the electricity will be generated with the rotation of the motors and the generated electricity generated will be used for lightning the lights of the factories where the workers will work. So here the mechanical force is converted into electrical energy this is a free cost of energy. After that the boiler needs to be controlled so here controller circuit will be installed and sensor will be connected and the lights will act as load means the supply to the boiler will be shown. As soon as the temperature is increased the sensor will pass command to the controller circuits and the controller circuit will cut off the supply to the boiler based load so for loads as boiler we have used a light that means to indicate power.

VI. ADVANTAGES

- Free of cost energy, solar.
- In case of electric power failure the conveyor belt and the temperature circuit will run on solar energy.
- Through conveyor belt electricity will be generated and the light will be on.
- All the system will work on dc volt so the electricity consumption. Will be less as compared to ac supply for ac motor here the dc motor is used.

VII. FURTURE SCOPE

- In future the cell phone based controlling section circuits can also be installed so the light will be controlled through the cell based technology anywhere from the factory.
- It is a better use of non- conventional energy sources for over coming power crisis in a developing country. It is very much useful technique to decrease our dependence on fossil fuel.
- All the system will work on dc volt so the electricity consumption will be less as compared to ac supply for ac motor here the dc motor is used**.**

VIII. CONCLUSION

A power consumption model of the belt conveyor system was first deduced. The model takes into account the power consumption of the motor, frequency converter, and belt conveyor and fully considers the resistance of the belt conveyor during operation. The model is therefore accurate and widely applicable. A energy-saving control strategy of the belt conveyor system based on the material flow rate was then proposed. The strategy has a good energy saving effect and effectively avoids material stockpiling As the solar charges the battery and the transformer will also charge the battery it will be as per the requirement. The battery source will be used for running the load of the industry and the circuits will also work properly. It is a better use of non- conventional energy sources for coming power crisis in a developing country. It is very much useful technique to decrease our dependence on fossil fuel. Solar can have the cleanest and easiest energy output around, yet our technology is still fast. So used of solar system in our project the problem related environment are solve easily.

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