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Train Mounting T-Box for Wind Power Generation

Vaghela P. M[1], Thorat P. D[1], Lakudzode K. B[1], Prof. Udamle S. R[2]

[1]UG Student, [2]Professor HOD
[1,2]Electrical Engineering, HSBPVT's Faculty of Engineering College, Kashti, Maharashtra, India

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ABSTRACT

Today many industries are rapidly growing to the wind energy generation. Nowadays, the need of energy resources is increasing at a much faster rate. We need to capitalize all the available options to complete all our needs with ease. For this, inventions such as T-BOX are very helpful. As it needs only wind from passing trains to produce the energy. Since fasting is going on for alternative forms of treatment, T-box has created hope. This device introduces a new generation of wind energy generator producing very prominent in techno buffs. That's it however, it is important to remember, that the design is still in a conceptual state, so that in the future, the 'use and maintenance' of this device has not been resolved. Our evolution shows that (i) Constructing electricity Using the concept of rotation of wind turbine by hawking rail. (ii) Using air-tight coat to reduce large pressure and use it to control wind flow. The mouth of casing provided with valve to control the wind flow. To provide full mechanical support to the Train.

Keywords: *Power flow, Wind energy conversion, Wind turbine, Moving train, Wind rotation*

INTRODUCTION

Energy resources in our modern fast paced country are fast depleting, hence it is indispensable that we find new ways of generating energy which is both self-starting as well as easily manageable. Wind energy has long been used to generate electricity through wind turbines and has proved to be one of the most reliable renewable sources of energy in many countries.However, since there are very few regions in the world that experience windy conditions throughout a year, this method becomes restricted to only a few chosen regions. The same concept is used in this project, but with a different perspective. Any locomotive be it train, car or even a bicycle when in motion produces wind currents along the direction of their motion. This happens because of the disturbance in air produced by the moving body of the vehicle. This wind if tapped efficiently over duration of time can lead to production of substantial amount of power. The idea of a train being able to utilize its very infrastructure to generate electricity is very fascinating.

Generating power by harnessing the wind energy created by fast moving trains is not an idea that may occur to the average researcher. Now days the need of energy resources is increasing at a much faster rate. We need to capitalize all the available options to complete all our needs with ease. As the hunger for alternative forms of energy continues, the T-box has generated hope. This device presents a new generation of wind power generators, and has created quite a sensation among techno buffs. However, it is important to remember that the design is still in the conceptual stage and has not taken into account all of the preservation and maintenance issues that are likely to pose a problem in any future use of this device. Wind presents a vast source of renewable energy. Wind energy is in fact an indirect form of solar energy.

Wind regenerated due to heating of air by solar Radiations during the day. Heated not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable

Block Diagram

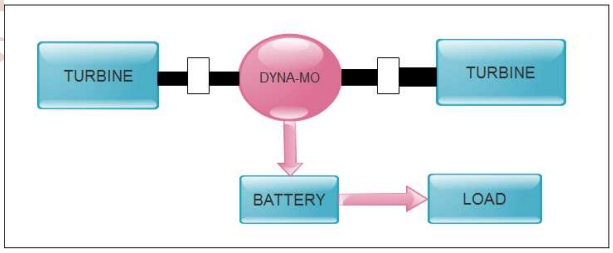

Fig. Block diagram of T- box wind power generator

Fig. shows the basic block diagram of T-box wind power generator which includes to two wind turbine. Turbines are kept in two side of dynamo. Dynamo converts mechanical energy into electrical power. Power generated by dynamos Direct Current in nature. In this we use two side shaft dynamos for generation. Dynamo is placed between two turbines and coupled to turbine with the help of rigid shaft coupling.

The whole assembly is installed on train at bottom side of train. When train start moving ate air pressure is developed which rotates turbine ultimately turbine rotate dynamo as they are coupled and electrical power is developed at terminals of dynamo.

T-Box Assembly

U Firstly take Metal Steel strip having 50mm width and 4mm thickness. Cut the strip in 4 pieces of 360mm length. Drill all 4 strips of 20.2mm for bearing mounting. The drill at 200mm from one end of strip this is for all strips. Then fix bearing in strip and weld it. Then take turbine and insert its shaft in bearing on both sides. The length of shaft kept 20mm outside the strip on both side & 25mm inside the strip. The 200mm length side of strip kept at bottom for both sides i.e. 160mm side is at top. To hold the strip at same distance rod is welding to bottom side. Same assembly does for another turbine. To provide support to dynamo a strip is welding between two turbines and kept distance between turbine 130mm. Take coupling and fit on shaft of turbine and another one is on second turbine shaft. Fix dynamo mounting support and make sureties mounting. Shaft of dynamo is inserting in both side coupling then tight the screws of couplings.

Two turbines are coupled by a strip welding at top of it also hold the turbine covers. A semi-circular cover is made for turbine having length 400mm and diameter 320mm. two individual cover is made for two turbines. The material used for is punctuated within the parentheses.

Dimensions details of T-box

Total length 1000mm details in table

Length of turbine / Quantity	350mm/2
Bearing thickness / Quantity	12mm/2
Gap between turbine and bearing.	25mm each side (4 place)
Thickness of dynamo stator	60mm
Distance between dynamo stator and turbine bearing	45mm(2place)

Table: Dimensio detail T-box

Wind Turbine

A wind turbine is a device that converts the wind's kinetic energy into electrical power. Wind turbines are manufactured in a wide range of vertical and horizontal axis types. The smallest turbines are used for applications such as battery charging for auxiliary power for boats or caravans or to power traffic warning signs. Slightly larger turbines can be used for making contributions to a domestic power supply while selling unused power back to the utility supplier via the electrical grid. Arrays of large turbines, known as wind farms, are becoming an increasingly important source of intermittent renewable energy and are used by many countries as part of a strategy to reduce their reliance on fossil fuels. Wind presents a vast source of renewable energy. Wind energy is in fact an indirect form of solar energy Wind regenerated due to heating of air by solar radiations during the day. Movement on the earth surface is influenced by the terrain, water, reserve etc. Wind or air in motion contains the kinetic energy which is converted into mechanical power by means of wind turbine which is connected to a generator for producing electricity. At present there are many ways to generate electricity but these power generation techniques result in pollution and so power generation using renewable source in essential. This paper is thus a proper method to provide electricity using wind turbine mounted bottom a train at inclined position. Thus power produced can provide the electricity to the various loads connected inside the train. Wind energy is one of the fastest growing source of electricity and also one of the fastest growing markets in the world today. The growth tends to be linked with the multi-dimensional benefits associated with wind energy such as green power, sustainable, affordable and economic development. Now days, basically two wind turbines are used.

They are

- Vertical axis wind turbine (VAWT)
- Horizontal axis wind turbine (HAWT)

Vertical axis wind turbine has the horizontal main rotor shaft. The main advantage is that the generator and gearbox can be placed at the bottom or near the ground. Turbine does not need to be pointed into the wind. Wind turbines are those that differ significantly from the most common types in use. The most common type of wind turbine is the six-bladed upwind horizontal-axis wind turbine (HAWT), where the turbine rotor is at the front of the nacelle and facing the wind upstream of its supporting turbine tower. A second major unit type is also classified by its axis the vertical-axis wind turbine (VAWT), with blades extending upwards that are supported by a rotating framework. Due to the large growth of the wind power industry and the length of its historical development dating back to windmills, many different wind turbine designs exist, are in current development, or have been proposed due to their unique features. The wide variety of designs reflects ongoing commercial, technological, and inventive interests in harvesting wind resources both more efficiently and to the greatest extent possible, with costs that may be either lower or greater than conventional six-bladed vertical axis wind turbine designs.

Train Mounting T-Box for Wind Power Generation Some turbine designs that differ from the standard type have had limited commercial use, while others have only been demonstrated or are only theoretical concepts with no practical applications. Such unconventional designs cover a wide of innovations, including different rotor types, basic functionalities, supporting structures and form-factors. T-Box Installation for Power Generation The device, called a T-box, differs in that it is designed to be installed within the actual railing track itself. It consists of a durable metallic cylinder with vents, which allow air to flow through and rotate turbine blades housed inside. Yanko claims that a 1000 meter stretch of railroad can be retro fitted with about 150 T-boxes. Considering that a train barreling down at a speed of 200 kilometers per hour creates winds of roughly 15 miles a second, the T-boxes could generate 2.6 Kwh of electricity. But we are installed T-box on train so it continues rotate with train generates more energy than installed on track. But like many similar ideas, the T-box currently exists in the pristine world of concepts where issues like debris, dirt and maintenance issues are absent, which isn't the case in the real world. So there's a strong likelihood that train passengers will never see one in operation a speeding train,

for instance, produces tremendous gusts that can just as easily be converted into electricity. A couple years ago, an Indian inventor a modification to current trains that, according to his calculations, would have harvested as much as 10,000 megawatts of electricity each day from trains operating in Mumbai, a city in India.

Now designers from the firm Yanko Design have seized upon the same principle and developed a device that can collect wind energy from passing trains. The technology works similarly to a wind tunnel concept put forth last year by a team of Korean designers in which miniature turbine based generators would be strategically placed at various spots along the walls of a subway train tunnel.

Problems facing when T-box installed on track

1. After passing of train sudden high pressure air applied on T-box gives mechanical Damage.
2. As half part of T-box there is no chance to our air from turbine
3. so turbine fail to Rotate.

More no of T-box required for track electrification.

Changes to overcome problems

To overcome this problem we attached T-box to train at bottom side on train. Due to this T-box run with train and start rotating at slow when train is slow and gradually reach high speed according to train speed. In this way mechanical damage is avoided. Train Mounting T-Box for Wind Power Generation Also there is space to our air from turbine so it work satisfactory. We can connect no of T-box to generate required energy. All T-boxes are worked in parallel to meet the demand.

Invention

This invention relates to a method for generating electricity using high wind pressure generated by fast moving train the direction of the wind turbine. A fast moving train compresses the air in the front of it and pushes the air from its sides there by creating a vacuum at its rear and its sides as it moves forward. Take T-box assembly and fix it bellow the train, with nut-bolt are the mechanically couple & make output connection

Procedure

Wind movement on the earth surface is influenced by the train, water, reserve etc. Wind or air in motion contains the kinetic energy which is converted into mechanical power by means of wind turbine which is connected to a generator for producing electricity. At present there are many ways to generate electricity but these power generation techniques result in pollution and so power generation using renewable source in essential. T-box wind power generator which includes to two wind turbines. Turbines are kept in two side of dynamo. Dynamo converts mechanical energy into electrical power. Power generated by dynamos direct current in nature. In this we use two side shaft dynamos for generation. Dynamo is placed between two turbines and coupled to turbine with the help of rigid shaft coupling.

The whole assembly is installed on train at bottom side of train. When train start moving at air pressure is developed which rotates turbine ultimately turbine rotate dynamo as they are coupled and electrical power is developed at terminals of dynamo. Train Mounting T-Box For Wind Power Generation.

When the train moves with an average speed, the wind turbine attached to it also rotates. The turbine should be placed in such a way that the wind strikes the blades. Its gives the turbine a rotational movement the turbine is placed along the path of the wind flow path that is mounted on the bottom side of train, then the blade rotates and energy is generated and this rotational energy can be converted into electrical energy which can be stored in a battery. This provides power to the various loads such as fans and lights etc

Result:

Sr. no	Pressure(bar)	Speed(RPM)	DC voltage
1	0.8	150	16
2	1.5	300	27

Fig. Voltage Measure in Compressor Pressure

Theoretical calculation

Total distance of one compartment: - 32ft.
Distance between ground to bottom side of train:-4ft.
T-box installed in one compartment: - 10 T-box.
Load between one compartments: - (20 Fan for 60 watt and 22 FL for 18 watt)
Train travelled by 60 Kmph
Air pressure 1.5 to 1.9 bar (1 bar = 14.5 psi)
Train travelled by 80 Kmph
Air pressure max 3 bar (3 bar = 43.5 psi)
Compartment for actual load:-fan 20,FL 22(Total 18 Watt)
Total Watt =20*60+22*18=1596 Watt
Total compartment Load 1596*20=31920 Watt
60Kmph =Generated 550 Watt in 1 Km(150 T-box)
Total Generated Power 550*60 =33000 Watt
1 T-Box 60km=220Watt
Energy Stored=33000-31920 =1080 Watt

Advantages

1. It is very easy to install.
2. Needs less maintenance & has less chances of Failure.
3. It is Efficient.
4. t is Cheaper, Construction of T-Box is very easy and also it does not cost so much.

Disadvantage

1. The Effect of T-Box for Dust, Dirt.
2. Proper Observation.
3. The more than speed for the T-Box more changes damage

Application

Railways, General transport (Bus)

Conclusion

From this project we concluded that 27 voltage is generated. In near future we can generate as required.

This Prototype Model is more effective and assembly of T-box is installed at bottom side of the train. The generation for Mechanical energy to electrical energy. When implemented it will meet up the power requirement for future generation this method is more reliable. These T-box needs less capital investment compared to the solar panel installation of same capacity. The turbine (T-box) Easily Rotation speed 31 rpm for generation in LED lamp 12 Volt DC Blink.

Future scope

1. We are planning to give more features to like Solar PV-wind Hybrid Power Generation System. The solar and wind energy is renewable energy source for continuous generation of electricity.
2. Piezoelectric and Wind Hybrid Power System

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