Energy Generation through Artificial Air Flow

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Abstract: Law of conservation of energy state that energy neither be created nor destroyed; energy can only be transferred or changed from one form to another therefore total energy of system remains constant. In this paper such device is presented which operate on electrical energy and produce more kinetic energy (K.E) in the air flow. Device is made of various components such as centrifugal blower, converging nozzle, and throat and diverging nozzle. Blower is operated through an electric energy and thrown out air present in casing which create pressure difference this generates the flow of air. The output kinetic energy in throat is more than double the input electrical energy.

Index Terms - green energy, sustainable energy, violation of energy law, wind energy, artificial air flow

I. INTRODUCTION

The demand of electric power has exponentially increased with the increase in industrialization. In order to meet this ever growing demand of electric power, various renewable energy sources are used. Out of the available renewable energy sources, wind energy is a clean and an endless source of energy. Typically, the availability of wind energy, at a particular location, is inherent and unpredictable. Due to such unpredictable nature of the flow of wind, the electric power generated by the conventional systems is unregulated.[1] Construction of wind power requires wind speed data at a height corresponding to the location of the wind turbine. The higher the turbine layout that will be more likely to be accepted by the turbine speed can be used to drive a generator. [2] Wind energy is a renewable energy that can be utilize as electrical energy with Wind Energy Conversion Systems. Therefore, there is a need of wind power generation system that alleviates the aforementioned drawbacks of the conventional system. Amongst all the options of non- conventional energy wind energy is the most cleanest and endless source of energy and hence cannot be ignored in future. Unpredictability of wind limits its applications to produce wind power at any place, time and desired quantity like a typical industrial product. This is the biggest regret of every technocrat working in this field. [3] Now a days need to produce new technology for generation of green and sustainable energy through wind power sources. To achieve these target Hajare *et al* produce a new device for generation of continuous energy by using artificial wind flow.[3] In this paper, for the first time authors provide information about the device which generates larger output energy than the given input. The device consists of various components such as centrifugal blower, converging nozzle, throat and diverging nozzle. Blower is used to initiate the air supply which is discharged to a converging nozzle having decreasing cross sectional area. At the exit end of converging nozzle throat is attached where the kinetic energy is maximum in the air flow. This kinetic energy is more than double the input electrical energy.

II. RESULTS AND DISCUSSION

Artificially generated air flow is used to generate energy and it overcomes the limitations of conventional wind energy. A system to generate artificial air flow is described in the Figure 1.

Centrifugal blower operated by electric motor produces a centrifugal force inside the casing. Air present inside the casing of the blower is thrown out due to centrifugal force, which creates low pressure region (lower than atmospheric pressure) inside the casing of the blower. This pressure difference causes the flow of atmospheric air inside the casing of the blower with predetermined speed and pressure. This air flow arises due to combine effect of artificial centrifugal force and natural gravitational force. Centrifugal blower increases the pressure of the incoming air discharged through conversing nozzle. In this process area at the outlet of the

conversing nozzle is reduced in specific proportion but force exerted by centrifugal blower is same according to the formula, Pressure = Force/Area
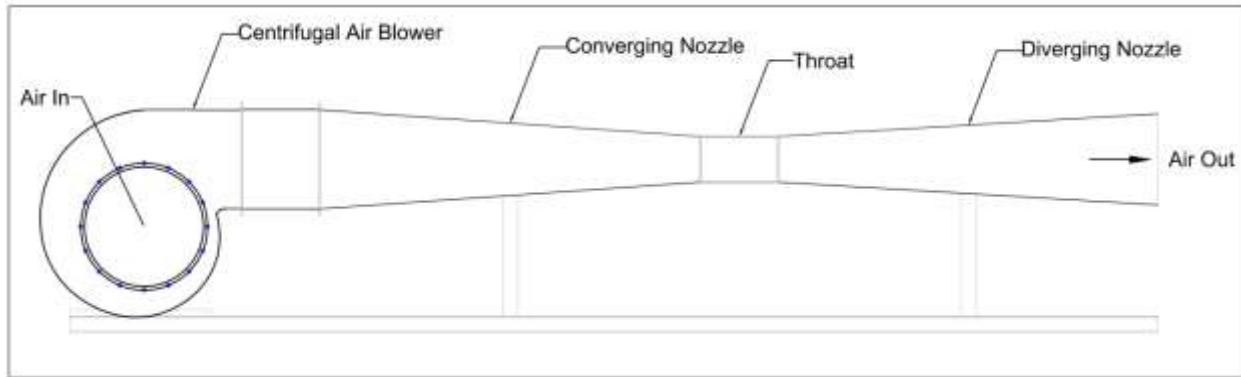

Figure 1 Schematic of device generating artificial air flow.

As force remains same and area is reduced therefore pressure increases and ultimately air speed increases. This high speed air is introduced into the throat. At the exit end of throat diverging nozzle is provided to avoid choke up of air flow due to high speed in throat.

The input electrical energy given to blower is

Input electrical energy = P.F x $\sqrt{3}$ x V x I……………….. (1)

$$= 0.89 \times \sqrt{3} \times 440 \times 70$$

$$= 47,478.97$$

$$= 47.47 \text{ KW}$$

Where P.F = Power Factor of electric motor

V = voltage (volt)

I = current (Ampere)

Velocity of air in throat is given by,

$$V = \sqrt{\frac{2(\Delta h \, X \rho_1 X g)}{\rho}} \quad \text{…………………………………(2)}$$

Where, Δh is the height difference of the water columns of manometer in meters.

ρ_1 is the density of the liquid (i.e water) in the manometer

g is the acceleration due to gravity

ρ is fluid density in kg/m^3

$$V = \sqrt{\frac{2 X 1.2 X 1000 X 9.81}{1.05}}$$

V = 149.74 m/s

Mass flow rate is given by

m = ρ A V………………………………………..(3)

Where m = mass flow rate

A = Area of throat

V = velocity of air at exit of throat

m = 1.05 x 0.07065 x 149

m = 11.05 kg/s

Kinetic energy of air flow in throat

K.E = 0.5 x m x V^2

K.E = 0.5 x 11.05 x $(149)^2$

K.E = 122660.52 W

K.E = 122 KW

III. CONCLUSION AND FUTURE SCOPE

Based on the above result it observes that, the artificial air flow generated by 47.47 KW of input electric energy, produces 122KW K.E in a flow of throat. This K.E is more than the input energy, it suggest that this device violates the law of conservation of energy. The observed input to output energy ratio (1:2.5) gets increased in a desired proportion to achieve the green and sustainable wind energy.

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