Journal of Electrical Engineering & Electronic Technology

Commentary A SCITECHNOL JOURNAL

# Enhanced Electro Hydro Dynamic and Electrostatic Devices Based on Polarization Effect

**Lindhard Tina***

*Department of Electrical Engineering, University of Padua, Febbraio, Padova, Italy*

***Corresponding Author:** Lindhard Tina,Department of Electrical Engineering, University of Padua, Febbraio, Padova, Italy. E-mail: tinahardgam@gmail.com

**Received date:** 16 May, 2022, Manuscript No. JEEET-22-54777;

**Editor assigned date:** 18 May, 2022; PreQC No. JEEET-22-54777(PQ);

**Reviewed date:** 27 May, 2022, QC No. JEEET-22-54777;

**Revised date:** 09 June, 2022, Manuscript No. JEEET-22-54777(R);

**Published date:** 20 June, 2022, DOI: 10.4172/jeeet.1000912.

## Description

Electro hydro dynamic (EHD) and electrostatic propulsion devices were developed in the 1920s by Thomas Townsend Brown. One such device, called a lifter, has no moving parts and in the air, operates on electrical energy. It is a fashionable device and has a very simple structure, basically consisting of a narrow wire electrode and a large, flat one. However, it has a low ratio of propulsion force to unit electrical input power. According to theory, the propulsion force it generates depends on the interaction between the ion density of the ionized air and the charges on the surface of the large electrode. EHD and electrostatic propulsion models using the polarization effect are proposed to improve the ratio of the propulsion force to unit electrical input power. The propulsion device generates propulsion force through the use of an asymmetrical metal structure with charges generated by the polarization effect. The propulsion force the new devices generated for the same electric energy was 5.7 times higher than that of a basic type lifter owing to additional propulsion force being generated by the maximum polarization effect in the experiments. It was found that combining other effects with this polarization effect results in the ratio of generated propulsion force to electric power being close to 100N/kW when the electric power is high.

This value is as high as that of a helicopter. We also performed numerical analysis was also performed for capacitances and charges for various kinds of EHD and electrostatic propulsion devices. An optimized system was developed and is discussed in this system. Electrostatic propulsion, polarization, electric field, charge, electron. A lifter that is made light in weight by using a high voltage supply floats in the air. For such lifters, only electrical energy is needed to obtain the propulsion force in the air. Normal propulsion devices such as rockets need materials to be propelled. Lifter-type propulsion devices have no moving parts as helicopters do, and can be expected to be used as unmanned aerial vehicles in the future. The Biefeld-Brown effect was discovered by Paul Alfred Biefeld and Thomas Townsend Brown in the 1920s. Brown also proposed and was awarded patents for a number of electro hydro dynamic (EHD) propulsion devices, such as lifters. The principle, which is called ion craft, should be the same as that of the lifter. Many movies of lifters floating in the air can be seen on the Internet and a number of papers on the theory of lifters to generate propulsion forces have been published. After the Biefeld-Brown effect was published, many discussions on it were held. Mainly, the principles behind the effect were discussed and many theories to explain the generated propulsion forces were proposed.

## Electrical Input Energy

One view, that the effect can be explained by generation of momentum by ion wind, was shown by the USA's National Renewable Energy Laboratory. However, recent rigid research indicates that the principle of the propulsion can be explained as the electrical forces between charges in ionic wind and the electrons on the large flat electrode. Thus, it has been shown that the lifter propulsion is based on a principle that differs from conventional principals. Rockets work on the basis of the equation of motion. The objectives in developing the propulsion devices are achieving low propulsion force to electrical input energy, low propulsion force per unit volume and low propulsion force per unit weight. Some papers have previously reported experimental results for improving the ratio of generated propulsion force to electric energy. Thus, at present, heavy, high voltage sources cannot be mounted on propulsion devices. Electrode to make the ion source small. In addition, propulsion devices using the polarization effect, such as a cascading model, were fabricated to improve the ratio of propulsion force to electrical input energy. electrode for the structure of the EHD device in order to use the model as a unit module, achieve uniform divergence of the ionized air in the radial direction, and efficiently protect the ion density in the rounded electrode from degradation. I used metal structure for the device to enhance the charges on the electrodes owing to the polarization effect. The emission of ions from the negative needle electrode and the propulsion force produced by the electrical field between the ion wind and the large electrode or between the ion wind and the polarization electrodes. For the idea for polarization effect in EHD devices, one of Brown's patents proposed that an EHD device in which a dielectric material is sandwiched between the electrodes produces high propulsion force. The details for this experiment differed from those given in Brown's patent in that propulsion forces are generated by metal electrodes for which an asymmetrical structure is used to produce the polarization effect.

## Converter Control Modulation

The needle electrode was connected to the negative and the large electrode to the positive voltage. If the aluminum foil is very thin, the potential that confines the charge will degrade and thus charges on the metal plate cannot be confined efficiently. Basically, the structure of the large electrode must be maintained to store a lot of charges. In the future, the optimized thickness should be studied. Modifications should also be made to obtain a higher ratio of the generated force to electrical input power. Using multiple large, flat electrodes as positive electrodes should make it possible to improve the ratio, since it should enhance the electrical field intensity. The experimental data in reference shows the effect to improve the ratio of generated force to electrical input power clearly. However, the effects of enhancing the electric field intensity due to the edge and flat surfaces of electrodes are mixed. Discussed various kinds of proposed EHD and electrostatic propulsion devices using asymmetrical polarization electrodes that propose as means to improve the ratio of generated propulsion force to electrical input power. The levels of force that the devices generated were measured in experiments. Electrical charges on the surfaces of electrodes were estimated numerically with an aim to improving the

generated force. The models substantially improved the generated force for the same electric energy, the force they generated was 5.7 times higher than that of a basic type lifter. This was due to additional propulsion force being generated by the polarization effect. A self-adaptive converter control modulation is proposed in this system. Based on the outputs of two uniform operational Trans conductance amplifiers which are influenced by the feedback voltage, both of the pulse on time and pulse off time will be changed simultaneously. A self-adaptive frequency can be achieved in this control modulation. It can get a same output voltage ripple with a lower control frequency. A self-adaptive converter regulation is proposed with a simple control mode. The feedback voltage from output will be used to adjust the on time and off time of the pulse simultaneously. The simulation result shows that this control regulation can get a same voltage ripple with a lower control frequency under the same conditional. And also the self-adaptive frequency achieves the wide range high efficiency. Because lower switching frequency reduces switching losses.