PATENT SPECIFICATION

DRAWINGS ATTACHED

920,498

Date of Application and filing Complete Specification: March 23, 1959.
No. 9970/59.
Application made in United States of America (No. 734,494) on May 12, 1958.
Application made in United States of America (No. 745,652) on June 30, 1958.
Complete Specification Published: March 6, 1963.

Index at acceptance:—Classes 39(1), L; and 110(3), JX1.
International Classification:—H01j. F02k.

COMPLETE SPECIFICATION

Electrical Thrust Producing Device

I, AGNEW HUNTER BAHNSON, Jr., a citizen of the United States of America, of 1001 South Marshall Street, Winston-Salem, North Carolina, United States of America, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an electrical thrust producing device comprising an arrangement of spaced electrodes supported upon a carrier body of electrical insulating material. The electrodes have such a configuration as to establish a non-uniform electrical field when a difference in potential is applied to the electrodes and the non-uniform field is believed to accelerate ions produced in the region of the charged electrodes, thus resulting in a thrust upon the supporting body as related to the surrounding gaseous medium in which it is placed. Such an electrical thrust producing device is disclosed in my United States Letters Patent No. 2,958,790 granted November 1, 1960.

In my aforesaid patent, the electrodes are charged from a source of unidirectional potential only. I have discovered that if the unidirectional potential is applied to certain electrodes of the assembly and an alternating potential is applied to other electrodes in the assembly, an augmented thrust effect results. While I am not certain as to the actual theory involved in this phenomena, repeated experiments have confirmed the fact that an augmented thrust does result, and it is my theory that the use of the alternating potential results in the production of more ions to be accelerated in the non-uniform field.

It has also been observed in these experiments that the frequency of the alternating potential has some effect upon the degree and efficiency of ionization of the gaseous medium in which the device operates, and it is further believed that an optimum condition results when the frequency is in resonance with the amplitude of the molecules of the excited gaseous medium in which the device operates.

Consequently it is an object of the invention to provide an electrical thrust producing device of the general type described wherein both unidirectional and alternating potentials are applied respectively to different electrodes in the electrode assembly so as to provide an optimum thrust effect, and to provide for adjusting the frequency of the alternating potential to establish a resonance condition with the surrounding medium.

According to the present invention there is provided an electrical thrust producing device comprising an elongated carrier member of electrical insulating material, at least three electrodes mounted on said carrier member in spaced relation from each other in the axial direction of the carrier member said electrodes having such configuration as to establish non-uniform electrical fields when differences of potential are applied to the electrodes, means applying a uni-directional potential between certain of said electrodes and means applying an alternating potential between other of said electrodes.

Referring now to the accompanying drawing, the supporting or carrier body for the electrode assembly is indicated at 10 and is seen to be in the form of a hollow cylinder made from a suitable dielectric material, which is relatively non-conductive in an electrical sense. Mounted at one end of the body 10 is an electrode 11 in the form of a ring which is made from electrically conductive wire supported in a suitable manner concentric with the longitudinal axis of the cylindrical body 10. Mounted upon the body 10 in spaced relation from the ring electrode 11 is an arcuately shaped electrode 12 which can be constituted by an arcuately shaped member 13 of dielectric material having an electrically conductive metallic surface 14 applied to its inner or concave periphery, or this metallic surface may

be embedded in a dielectric material and may be in the form of a screen having a fine mesh to define the electrode.

Also mounted upon the cylindrical body 10 in spaced relation from the arcuate electrode 12 is a second arcuate electrode 15. This electrode may be metallic throughout as illustrated in the drawing, or it may be made in the same manner as electrode 12, i.e. it may be constituted by an arcuately shaped member of dielectric material having an electrically conductive metallic surface applied to its inner, concave face. Electrode 15 is curved in the same direction as electrode 12 and both are symmetrical with respect to the longitudinal axis of the cylindrical body 10. At the opposite end of the body 10 is still another arcuate electrode 16.

In accordance with the invention, a unidirectional potential is applied between certain of the electrodes and an alternating potential is applied between other electrodes to obtain an optimum thrust effect upon the body in the direction of the axis thereof. In the embodiment of the invention which has been illustrated, a unidirectional potential shown schematically as a d.c. source 17 has the negative terminal connected by conductor means to the lower endmost arcuate electrode 16 and the positive terminal connected by conductor means to the ring electrode 11 and also to the arcuate electrode 15. A source of a.c., i.e. alternating potential 18, is also shown schematically and is connected by suitable conductor means between the endmost electrode 16 and the other arcuate electrode 12. Electrode 15 is disposed between the arcuate electrode 12 and the lower, endmost electrode 16, and it is believed that the alternating field which is produced serves to produce more ions to be accelerated in the non-uniform electrical field established between the other electrodes 16 and 11 by application thereto of the unidirectional potential, thus augmenting considerably the thrust effect which could heretofore be obtained by use of only a unidirectional potential.

Since the frequency of the applied alternating potential has some effect upon the degree and efficiency of the ionization in the gaseous medium in which the device operates, it will be seen that I have provided for adjusting the frequency of the alternating potential which is generated. This may be accomplished by various and well known devices and hence the frequency control has been indicated schematically only at 19, and optimum conditions are believed to prevail when the frequency corresponds to resonance of the amplitude of the molecules of the excited gaseous medium in which the device operates.

It is not necessary that the unidirectional and alternating potentials be applied to the electrodes in the specific manner above described.

The amount of the thrust to be obtained will depend upon various design factors such as the magnitude of the potentials applied and will in general increase as the magnitude of the potentials increases. For a given dimensional relationship between the various electrodes I have found that using a magnitude of 50 kilovolts for both the unidirectional and alternating potentials, a force of 6 grams was necessary to keep the assembly stationary. With a magnitude of 100 kilovolts, the force increased to 40 grams; for a magnitude of 125 kilovolts, the force increased to 60 grams; and for a magnitude of 150 kilovolts, the force increased to 100 grams.

In conclusion, it is desired to point out that while I have described and illustrated one embodiment of my invention, the specific details thereof may be departed from without, however, departing from the scope of the invention as defined in the appended claims.

WHAT I CLAIM IS:—

1. An electrical thrust producing device comprising an elongated carrier member of electrical insulating material, at least three electrodes mounted on said carrier member in spaced relation from each other in the axial direction of the carrier member, said electrodes having such configuration as to establish non-uniform electrical fields when a differences of potential are applied to the electrodes, means applying a unidirectional potential between certain of said electrodes and means applying an alternating potential between other of said electrodes.

2. An electrical thrust producing device as claimed in claim 1, wherein the carrier member is provided with a first electrode mounted at one end of said carrier member, and with two other electrodes mounted on said carrier member in spaced relation from each other and from said first electrode, wherein the said means for applying a unidirectional potential applies a unidirectional potential between said first electrode and the first one of said two other electrodes, and wherein the said means for applying an alternating potential applies an alternating potential between said first electrode and the second of said two other electrodes.

3. An electrical thrust producing device as claimed in either preceding claim, wherein the frequency of said alternating potential is adjustable.

4. An electrical thrust producing device as claimed in any preceding claim, wherein there is further provided an additional electrode in the form of a ring mounted on the other end of said carrier member.

5. An electrical thrust producing device substantially as described herein with reference to the accompanying drawing.

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Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press (Leamington) Ltd.—1963. Published by The Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

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1 SHEET *This drawing is a reproduction of the Original on a reduced scale*