Oct. 16, 1956 N. FELICI ET AL 2,767,335

ELECTROSTATIC MACHINE WITH ENROBED INDUCTOR MEMBER

Filed March 7, 1955

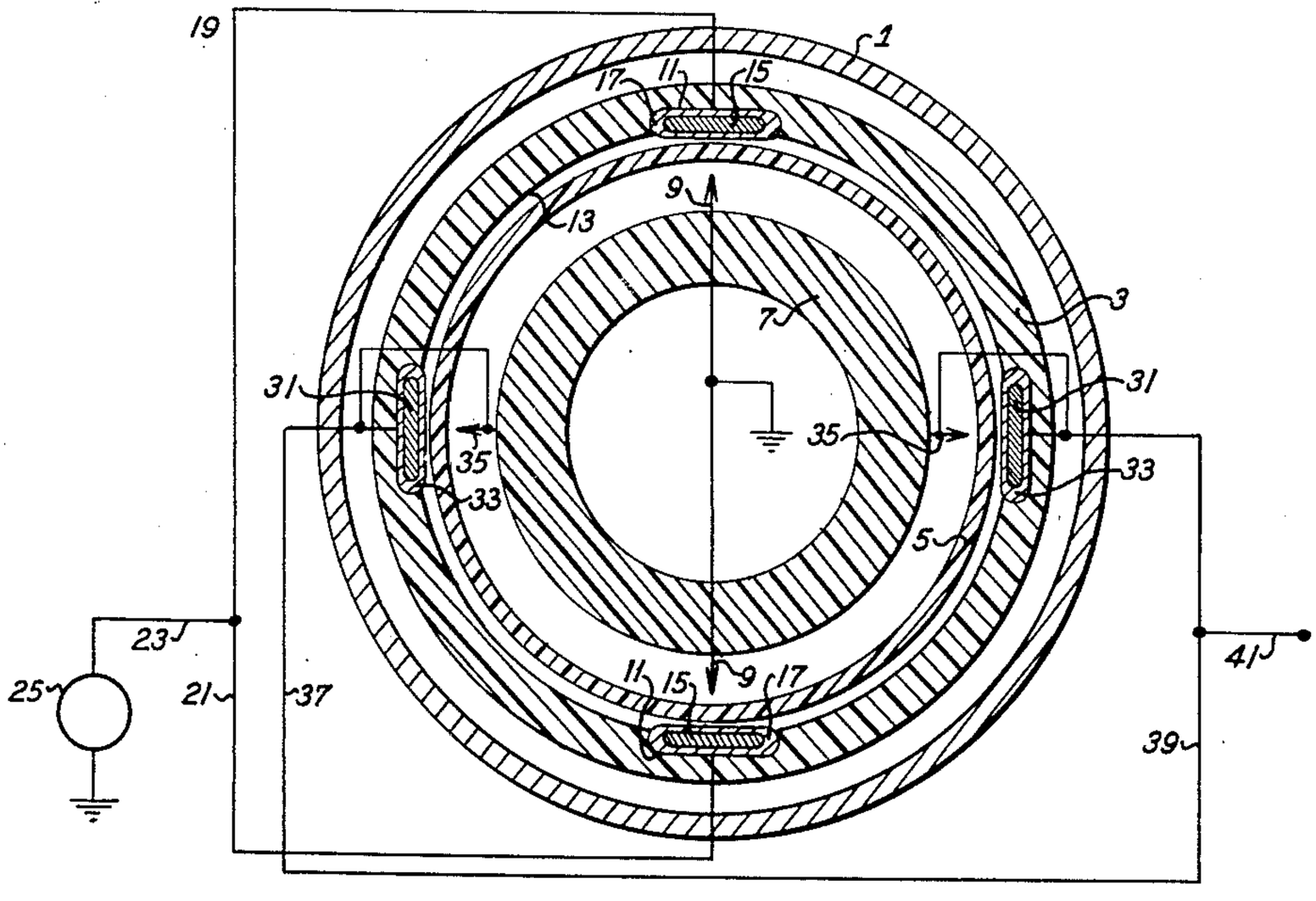

FIG. 1

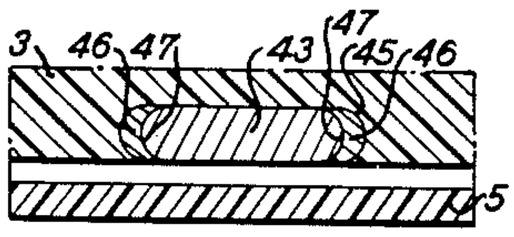

FIG. 2

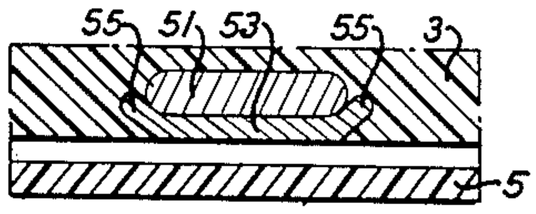

FIG. 3

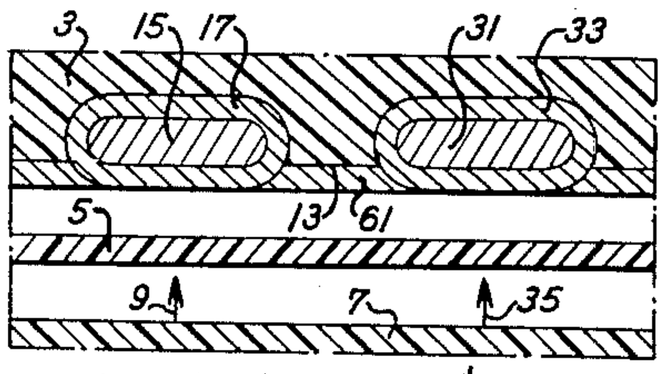

FIG. 4

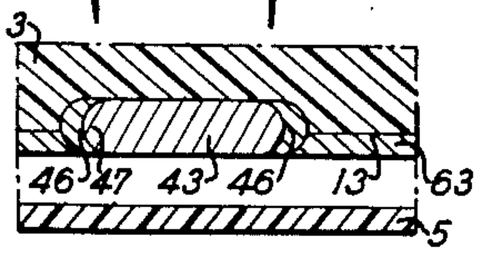

FIG. 5

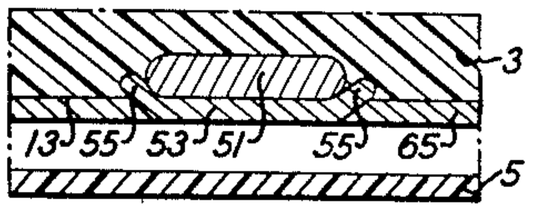

FIG. 6

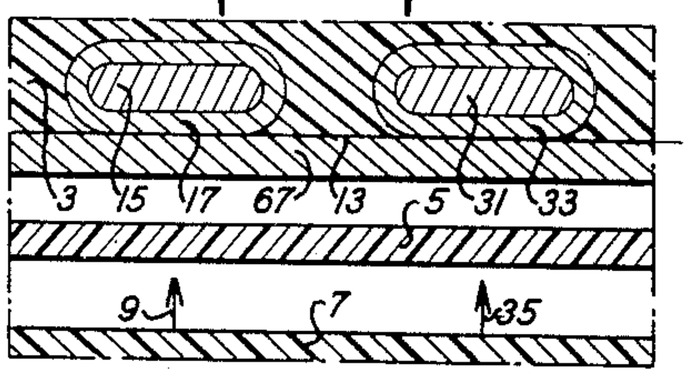

FIG. 7

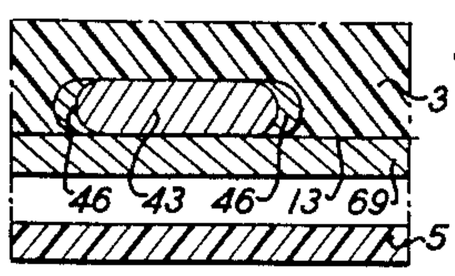

FIG. 8

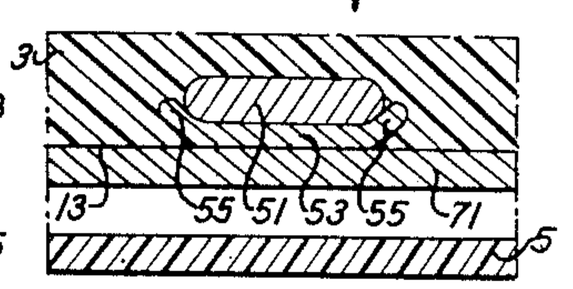

FIG. 9

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ELECTROSTATIC MACHINE WITH ENROBED INDUCTOR MEMBER

Noel Felici and Elie Gartner, Grenoble, France

Application March 7, 1955, Serial No. 492,492

Claims priority, application France March 8, 1954

13 Claims. (Cl. 310—6)

This invention relates to an electrostatic machine of the type which utilizes a conveyor of insulating material and in which an electrostatic field is developed between electrodes disposed at opposite sides of the conveyor wall for producing flow of ions through an ionizable medium, preferably a gas under pressure, to a surface of the conveyor wall to be conveyed thereon and collected therefrom by a suitable collecting electrode concomitantly with relative movement of the conveyor wall and these electrodes with respect to each other.

The invention more especially relates to a machine of this type in which an exciting inductor member maintained at a predetermined potential is disposed at a given face of a conveyor wall and in opposed relation to an exciter ionizing element disposed at the opposite face of the conveyor wall, the conveyor wall being movable generally parallel to the wall faces between the inductor member and the ionizing element. The invention particularly relates to an electrostatic machine of such construction which also utilizes a screen inductor member disposed adjacent the given face of a conveyor wall and in opposed relation to a collector ionizing element disposed at the opposite face of the conveyor wall and electrically connected to the screen inductor member, the screen inductor member and the collecting ionizer being spaced in the direction of movement of the conveyor wall from the exciter inductor member and the exciter ionizing element.

An electrostatic machine of this type is disclosed in the French Patent No. 1,051,430, publié January 15, 1954 and in the corresponding U. S. application Serial No. 321,351, filed November 19, 1952, now abandoned, and in the continuation-in-part application based thereon Serial No. 492,491, filed March 7, 1955. In the machine of the patent and of the application a body of high resistivity material is provided extending between and connected to the exciter and the screen inductor members for avoiding the concentration of the electrostatic field on the edges of the inductor members and to provide a smooth gradient of potential between these two inductor members. This body of high resistivity material may be provided by a homogenous material having for example a resistivity of the order of 10^{10} to 10^{13} ohms per centimeter per cm.^{2} It is further suggested in the patent and application that the insulating support or stator supporting the inductor members may carry a continuous layer of high resistivity material having a substantial thickness and connected to the two inductor members, this layer being carried on the surface of the stator disposed toward the conveyor and being disposed between the inductor members and the conveyor and covering and being in contact with the faces of the inductor members that are disposed toward the conveyor. While such a construction is highly advantageous in many electrostatic machines, particularly those of larger size, it is found that in small electrostatic machines, for example, in electrostatic generators for ignition of automotive internal combustion engines, the provision of the continuous

body or layer connecting the inductor members that are spaced along the path of movement of the insulating conveyor involves difficulties of construction and assembly and increases undesirably the cost of the machine.

It is an object of the invention to provide in an electrostatic machine of the type referred to a simplified construction for limiting the concentration of the field on the inductor members.

It is another object of the invention to provide a construction which secures substantial benefit of the high resistivity material with respect to the individual inductor members.

It is a further object of the invention to secure substantial control of the gradient of the field between the inductor members by the use of a limited amount of the high resistivity material.

It is a feature of the invention that the high resistivity material utilized for limiting concentration of the field at the edge portions of the inductor members and for controlling the gradient of the electrostatic field and of the potential between the inductor members at different potentials that are disposed in spaced relation along the path of movement of the conveyor wall extends about these edge portions of the inductor members, particularly the surfaces of what may be called the leading and trailing edge portions of each inductor member since they are disposed with respect to the body of the inductor member in positions spaced generally parallel to the path of movement of the conveyor. In the usual form, these inductor members provide a face that is parallel to the path of movement of the conveyor wall. In the embodiments disclosed in the French patent and in the corresponding U. S. application referred to above, these inductor members have faces which are disposed adjacent and in spaced relation to a given face of a cylindrical conveyor wall. This face of the inductor member has an extent in a direction parallel to the path of movement of the conveyor wall and may have a substantial extent perpendicular to this path of movement and parallel to the axis of rotation of the cylindrical conveyor wall. These inductor members preferably are formed with edge portions spaced along the path of movement that are oppositely convex with respect to the body of the inductor member. The invention is particularly concerned with these edge portions of these inductor members upon the edge surfaces of which, even though smoothly convex, the electrostatic field tends to be concentrated when the machine is in operation.

In an electrostatic machine of small size it has been found that these surfaces of the edge portions may be covered with a relatively small amount of the high resistivity material to secure a substantial reduction of the concentration of the field, even though the inductor members are not connected by a body or layer of high resistivity material as proposed in the French patent and the U. S. application referred to above. In accordance with the invention this high resistivity material thus disposed upon the edge portions of the inductor member also may extend upon the face of the inductor member that is disposed toward the conveyor wall. This high resistivity material also may extend upon the opposite face of the inductor member and may constitute a continuous covering enclosing or enrobing the individual inductor member.

Having regard to the high resistivity material extending about the edge portions of the inductor members, as above referred to, and the function thereof in reducing the concentration of the electrostatic field at these edge portions of the inductor members, it is further found that, instead of providing a layer of substantial thickness as suggested in the French patent and U. S. application extending between and connecting the inductor members that are spaced along the path of movement of the

conveyor, sufficient control of the field and of the gradient of potential between the two inductor members may be secured in a small machine by a relatively thin layer applied to the surface of the insulating stator supporting the inductor members that is disposed toward the conveyor wall. Such a thin layer may be applied as a coating on the stator wall surface. It has been found that satisfactory results may be obtained in some machines with a coating painted on the stator surface. In general, the thickness of the high resistivity material on the inductor members may be between one and five millimeters depending upon the size of the machine and the electrostatic conditions under which it operates, although the invention is not limited to this particular range of thickness.

In certain embodiments of the invention, instead of utilizing a covering of high resistivity material that covers the face of the inductor member disposed toward the conveyor wall or which fully enrobes the inductor member, the face of the inductor member disposed toward the conveyor wall may be left uncovered by this high resistivity material while providing for at least partially covering the edge portions as above mentioned. It is an important feature of the invention, moreover, that the inductor members are supported by the stator of insulating material in such a manner that this face of the inductor member, whether covered by the high resistivity material or not, is not covered by the insulating material of the stator. Thus, the bare face of the inductor member itself, or the bare face of the covering of high resistivity material on this face of the inductor member, is exposed toward the adjacent face of the conveyor wall. The action of developing an ionization field secured by the use of inductor members of the type referred to and disposed in adjacent spaced relation to a given face of the conveyor wall and in opposed relation to ionizing elements disposed in adjacent spaced relation to the opposite face of the conveyor wall is secured in the machine of the invention with an advantageous effect of the insulating material of the stator. This insulating stator, however, may serve rigidly to support the inductor members which may be disposed in recesses open at the surface of the stator that is disposed toward the conveyor wall.

Other objects and features of the invention will be understood from a description of the drawings to follow, in which

Fig. 1 shows diagrammatically in transverse cross section an electrostatic machine having a cylindrical conveyor rotatable on its axis and four inductor members each fully enrobed by high resistivity material and with corresponding ionizers disposed in opposed relation to the inductor members.

Fig. 2 shows a modified disposition of the high resistivity material on an inductor member.

Fig. 3 shows another modified disposition of the high resistivity material extending upon the face of the inductor member disposed toward the conveyor.

Fig. 4 shows two spaced inductor members in a modification of the arrangement of Fig. 1 in which the enrobed inductor members are connected by a coating of high resistivity material on the surface of the stator.

Fig. 5 shows a modification similar to Fig. 2 in which a coating of high resistivity material on the stator surface connects the inductor members.

Fig. 6 shows a modification similar to Fig. 3 in which a coating of high resistivity material on the stator surface connects the inductor members.

Fig. 7 shows an embodiment similar to Fig. 1 in which a coating of high resistivity material on the stator surface covers and is in contact with the face of the enrobing layer disposed toward the conveyor wall.

Fig. 8 shows an embodiment similar to Fig. 2 in which a coating of high resistivity material on the stator surface covers and is in contact with the face of the inductor member.

Fig. 9 shows a modification of the embodiment of Fig. 3 in which a coating of high resistivity material on the stator surface covers and is in contact with the facing of high resistivity material applied to the face of the inductor member.

In Fig. 1 within a crylindrical casing 1 capable of confining therein a gas under pressure, for example, at about 15 atmospheres, a hollow cylindrical stator 3 of insulating material is supported by suitable means, not shown, concentric with the axis of the casing 1. Within this stator 3 concentric with the axis a cylindrical conveyor 5 is supported for rotation of the conveyor wall on the axis. Within the cylindrical conveyor wall 5 an inner stator 7 of insulating material is disposed which may be of annular form concentric with the axis of rotation of the conveyor wall. The inner stator 7 supports exciter ionizing elements 9 adjacent and in spaced relation to the inner surface of the conveyor wall, these ionizing elements 9 being connected together in the embodiment shown and to a reference potential which may be ground.

Adjacent and in spaced relation to the outer surface of the conveyor wall 5 and in recesses 11 formed in the inner surface 13 of the outer stator 3 inductor members 15 are disposed in opposed relation respectively to the ionizing elements 9. The inductor members 15 in the embodiment of Fig. 1 are fully enrobed by a covering 17 of high resistivity material. In this embodiment this covering of high resistivity material is exposed at the inner surface 13 of the outer stator adjacent the outer surface of the conveyor wall. It is not covered by the insulating material of the stator 3.

The thus enrobed inductors 15 are connected by electrical connections 19 and 21 to the terminal lead 23 of an auxiliary source of potential 25 the other terminal of which is connected to a reference potential or ground. This source of potential serves to excite the enrobed inductor members 15 with respect to the respective ionizing elements 9 to develop an electrostatic field at each position transversely of the conveyor wall 5. The inductor members 15 and their respective ionizing elements 9 in the embodiment of Fig. 1 are disposed on a diameter through the axis of rotation.

On a diameter through this axis that is at right angles to the diameter of the exciter inductor members 15 screen inductor members 31 are disposed, these inductor members also being enrobed by a covering 33 of high resistivity material similarly to the inductor members 15, this high resistivity material being exposed at the inner surface of the stator 3 adjacent the outer surface of the conveyor wall 5. The screen inductors 31 are supported on the outer stator 3 in spaced relation to the outer surface of the conveyor wall 5 and respectively are connected to collector ionizers 35 disposed in opposed relation to the screen inductors at the opposite side of the conveyor wall and supported by the inner stator 7. The two sets of electrodes, each comprising a screen inductor member and a collector ionizer, are connected by conductors 37, 39 to an output terminal 41 of the generator.

In the embodiment of Fig. 1 the inductor members, each of which is fully enrobed by the high resistivity material, have an extent of their faces that are disposed toward the conveyor wall 5 extending parallel to the circumferential direction of movement of the conveyor wall. In a practical machine, these inductor members may and usually will have a substantial extent parallel to the axis of rotation. The ionizers shown only diagrammatically in Fig. 1 also may and usually will have a substantial extent parallel to the axis of rotation and may be of the forms which are suggested in the French patent and in the U. S. application above refererred to. In the embodiment of Fig. 1 the enrobing high resistivity material covers the opposite edges of these inductor members that are disposed in spaced relation to each other in the di-

rection parallel to the circumferential movement of the conveyor wall. These fully enrobed inductors are effective, as above mentioned, to reduce the concentration of the electrostatic field developed between the exciter inductor members **15** and the interposed screen inductor members **31** circumferentially spaced therefrom. It will be understood that the enrobing of the inductor members may be effected in any practical manner, having regard to the requisite mechanical support of these inductor members, either before or after insertion thereof in the recesses in the stator **3**.

Fig. 2 shows a modification in which an inductor member **43**, which may correspond to either of the inductor members **15** or **31** of Fig. 1, is disposed within the recess **45** in the stator **3**. In this embodiment the high resistivity material **46** covers both the convex edge surfaces **47** of the inductor member **43**. The face of the inductor member **43** that is disposed toward the conveyor wall **5** in Fig. 2 is exposed and not covered by the high resistivity material or by the insulating material of the stator **3**.

In Fig. 3 the inductor member **51** is disposed in a recess in the stator **3** and is covered at the face thereof disposed toward the conveyor wall **5** by a covering **53** of high resistivity material which at its end edge portions **55** extends about the convex edge surfaces of the inductor member **51** at least partially to cover these surfaces and thereby to reduce the concentration of the electrostatic field on these edge portions of the inductor member **51**. In Fig. 3 also the thus covered inductor member and its covering **53** are not covered by the insulating material of the stator **3**, the face of the high resistivity layer **53** being exposed toward the adjacent surface of the conveyor wall **5**.

Fig. 4 shows diagrammatically a modification of the arrangement in Fig. 1 in which the inductor members **15** and **31** that are spaced circumferentially along the conveyor wall **5** and are fully enclosed respectively by the enrobing layers **17** and **33** are connected by a coating **61** of high resistivity material which is carried upon the inner face **13** of the outer stator **3**. In this embodiment it will be noted that the inner face of the coating **61** is flush with the exposed face of the enrobing material on the respective inductors that is disposed toward the conveyor wall **5**.

It will be understood further, by a comparison of Figs. 1 and 4, that such a coating may be applied in any suitable manner so as to extend between the consecutive enrobed inductors and so that a substantially continuous layer or coating of the high resistivity material will be provided on the inner surface **13** of the stator **3** extending circumferentially about the axis of rotation of the conveyor. Thus, a smooth gradient of potential may be provided between each two spaced inductor members that are at different potentials along the inner surface of the stator **3** concomitantly with reduction of the concentration of the electrostatic field on the inductor members by the provision of the high resistivity material on the edge portions of these inductor members as above referred to. It will be further understood that this layer or coating, especially in small machines, may be comparatively thin while securing the beneficial effects referred to.

Fig. 5 shows another modification in which the inductor member **43**, as disclosed in Fig. 2, and having its edge portions **47** covered by the high resistivity material **46** is disposed projecting somewhat from the inner face **13** of the stator **3**, so that in the embodiment of Fig. 5 a layer or coating **63** may be applied to the surface **13** of the stator **3** of high resistivity material and connecting the covering portions **46** of the inductor members **43** that are spaced circumferentially about the axis of rotation of the conveyor **5**. In this embodiment the face of the inductor member **43** is exposed toward the conveyor **5**, as in the embodiment of Fig. 2.

Fig. 6 shows an embodiment similar to that of Fig. 3

in which the inductor member **51** at the face thereof disposed toward the conveyor **5** is covered by a covering **53** of high resistivity material having edge portions **55** that extend about the convex edge surfaces of the inductor member **51**. In this embodiment the inductor member and its covering **53** of high resistivity material are disposed somewhat outwardly with respect to the inner surface **13** of the stator **3**. A layer or coating **65** of high resistivity material is carried at the inner surface **13** of the stator **3** and is connected to the covering **53** upon the face of the inductor member **51**. In this embodiment also, as in Fig. 4, a continuous coating or layer **65** of high resistivity material may extend about the axis of rotation along the inner surface **13** of the stator **3**, the covering **53** on the face of the inductor member **51** being exposed at this inner surface of the stator.

Fig. 7 shows an arrangement similar to that of Figs. 1 and 4 in which the fully enrobed inductor members **15** and **31** are recessed in the stator **3** so that the face of the high resistivity enrobing material **17** and **33** is flush with the inner face **13** of the stator **3**. In this embodiment a continuous layer **67** of high resistivity material extends circumferentially about the axis upon the inner surface **13** of the stator **3** and in contact with the respective enrobing coverings on the inductor members **15** and **31**. In this embodiment also the gradient of potential between the inductor members **15, 31** may be secured by a relatively thin coating **67** having regard to the function of the high resistivity material carried upon the inductor members **15** and **31**, particularly upon the convex edge portions thereof that in each inductor member are disposed in opposed relation to each other in a direction parallel to the movement of the conveyor wall **5** and in two spaced inductor members are disposed toward each other.

In Fig. 8 the inductor **43** and its covering **46** of high resistivity material at the convex edges are disposed in a recess in the stator **3** similarly to the arrangement of Fig. 2. In the embodiment of Fig. 8 on the inner surface **13** of the stator **3** a continuous coating or layer **69** of the high resistivity material is disposed in contact directly with the face of the inductor member **43** that is disposed toward the conveyor wall **5**. It will be understood that this coating **69** also serves to provide a smooth gradient of potential acting together with the portions **46** to reduce the concentration of the field on the edges of the inductor member **43**.

Fig. 9 shows an arrangement similar to Fig. 3 in which the inductor member **51** and the covering **53** of high resistivity material are disposed as in Fig. 3 with this covering flush with the inner face **13** of the stator **3**. In this embodiment a continuous coating or layer **71** of high resistivity material extends upon this inner face **13** circumferentially about the axis of rotation of the conveyor wall **5** and in contact with the faces of the covering **53** of high resistivity material that are disposed toward the conveyor wall **5**, so that a smooth gradient of potential is provided between the inductor members at different potentials and, by virtue of the portions of the covering **53** that extend about the edge portions of the inductor **51**, the concentration of the field upon the edges of this inductor member is reduced.

It will be understood, although in the drawings the inductor members are shown disposed adjacent the outer face of the conveyor wall **5** and supported by the outer stator **3** adjacent its inner face **13**, the same arrangements may be secured with respect to inductor members that may be supported by the inner stator **7** adjacent its outer face similarly to an embodiment disclosed in the application Serial No. 321,351. Each of the modifications described may be utilized for particular purposes when the inductor members are thus supported adjacent either the outer or the inner surface of the conveyor wall **5**. The respective ionizing elements may be supported by the inner or the outer stator in the requisite opposed relation to the respective inductor members.

Also it will be understood that various mechanical arrangements of and supports for the inductor members and ionizers may be utilized within the scope of the invention, including those disclosed in the French patent and in the U. S. application referred to. Because of providing the high resistivity material extending about edge portions of the inductor members and utilizing a thin coating or layer of the high resistivity material on the surface of the stator supporting the inductor members, when it is desired to provide this coating, the spacing between the face of the inductor member that is disposed toward the conveyor wall may be reduced so that the requisite electrostatic fields are more easily developed, the ionizing elements being properly disposed close to and in spaced relation to the opposite surface of the conveyor wall, having regard also to the dielectric strength of the dielectric medium within the casing of the machine which surrounds the inductor members and the ionizers and their insulating supports.

Although the invention has been described more particularly in connection with an electrostatic machine having a conveyor providing a wall of insulating material extending about and rotatable on an axis of rotation, within the scope of the invention inductor members covered at their edge portions in the manner described and connected, if desired, by relatively thin coatings or layers of high resistivity material may be disposed in the requisite relation to a conveyor in the form of a disc rotatable on an axis, the inductor members being disposed adjacent a given face of this disc and the corresponding ionizers being disposed at the opposite face of the disc. The invention may be embodied in other forms of electrostatic machines utilizing a conveyor of insulating material and conductive inductor members while providing the feature that the inductor members at their edge portions are covered with a covering of high resistivity material.

The dielectric medium in contact with the ionizers and with the surface of the conveyor adjacent which these ionizers are disposed should have as high a dielectric strength and as high ionic mobility as possible. This medium may be constituted by a gas under pressure, for example, of the order of 10 to 15 atmospheres and preferably should be a gas not having affinity for electrons. Such a gas may be very pure nitrogen or very pure hydrogen and particularly should be free of electro-negative impurities capable of fixing the electrons as would be the case with oxygen or the chlorine compounds. Hydrogen is particularly advantageous because of its high ionic mobility.

The space between the inductor members and the adjacent conveyor surface in which also an intense electric field exists also may be filled with a fluid dielectric medium of high dielectric strength and, if possible, one having a high dielectric constant. In a practical machine such a medium may be provided by a compressed gas, for example, nitrogen, oxygen, freon or other similar gas alone, or a mixture of such gases, or an insulating liquid. It, therefore, would be of interest to arrange the machine so that different fluid mediums would be in contact with the respective surfaces of the conveyor, for example, hydrogen at the side at which the ionizers are disposed and a mixture of nitrogen and oxygen at the side at which the inductor members are disposed.

For reasons of simplification of the construction, however, advantageously the assembled machine may be enclosed in a single casing filled with a medium under high pressure which meets so far as possible all of the conditions above mentioned, the shaft which carries the conveyors passing through a stuffing box in the wall of this casing. Having regard to its dielectric strength and its ionic mobility and the fact that it has no substantial affinity for electrons very pure hydrogen preferably is used for this gaseous dielectric medium at a pressure of about 10 to 15 atmospheres.

In order to secure the advantages of the invention in a practical machine of small size and especially one developing a high potential, it is desirable that the space between the stator which carries the inductor members and the conveyor, or between the covering of high resistivity material on this stator and the conveyor, shall be as small as possible. The dielectric medium in the small continuous space extending between the stator and the conveyor thereby is made more effective. Especially in a machine which utilizes a rigid cylindrical conveyor of insulating material and a rigid stator of insulating material carrying the inductor members, it is possible to support the conveyor for rotation on its axis with close clearances between the surface of the conveyor wall and the stator surface to maintain the restricted width of the continuous circumferential space about the conveyor wall which is filled with the dielectric gas.

The variations and modifications of the structure of the invention above referred to and others which may be necessary for construction of a practical machine to suit different conditions, while utilizing the high resistivity material extending about the edge surfaces of the inductor members, may be made within the scope of the invention and are intended to be within the scope of the appended claims.

We claim:

1. An electrostatic machine comprising a conveyor providing a wall of insulating material having opposite faces thereof extending generally parallel to a path of movement of said conveyor wall, means for supporting said conveyor wall for movement thereof in said path, a stator of insulating material disposed adjacent and in spaced relation to a given face of said conveyor wall and having a surface extending along said face generally parallel to sail path of movement of said conveyor wall, a conductive inductor member supported by said stator and having a face disposed toward and adjacent and in spaced relation to said given face of said conveyor wall and having between edge portions thereof an extent generally parallel to said path of movement of said conveyor wall, said inductor member at said face thereof being uncovered by said supporting insulating stator, a covering of high resistivity material extending about said inductor member at least at a given one of said edge portions of said inductor member, and an ionizing element supported adjacent the other face of said conveyor wall in opposed relation to said inductor member for developing an electric field between said inductor member when charged and said ionizing element through which field said conveyor member moves in said path.

2. An electrostatic machine as defined in claim 1 in which said high resistivity material encloses said inductor member.

3. An electrostatic machine as defined in claim 1 in which said inductor member provides at said given edge portion thereof an edge surface of convex contour with respect to the body of said inductor member and smoothly connected to said face of said inductor member disposed toward said given face of said conveyor wall, said high resistivity material covering at least a part of said convex edge surface.

4. An electrostatic machine as defined in claim 3 in which said high resistivity material also covers said face of said inductor member that is disposed toward said given face of said conveyor.

5. An electrostatic machine as defined in claim 3 in which said inductor member provides at the edge portion thereof opposite in the direction along said given face of said conveyor wall to said given convex edge surface an oppositely convex edge surface smoothly connected to said face of said inductor member, said high resistivity material extending upon both of said convex edge surfaces of said inductor.

6. An electrostatic machine as defined in claim 1 which comprises charge transfer means disposed in the direction of movement of said conveyor wall in said path along

said path from said inductor member, said transfer means comprising an electrode disposed adjacent and in spaced relation to said given face of said conveyor wall, and a body of high resistivity material extending generally parallel to said path of movement of said conveyor between said inductor member and said electrode and electrically connected to said inductor member and said electrode to determine a controlled potential gradient therebetween.

7. An electrostatic machine as defined in claim 6 in which said body of high resistivity material is continuous with said high resistivity material extending about said inductor member.

8. An electrostatic machine as defined in claim 1 which comprises a screen inductor member disposed adjacent and in spaced relation to said given face of said conveyor wall and in spaced relation to said first inductor member in the direction of movement of said conveyor in said path, a second ionizing element disposed adjacent and in spaced relation to the face of said conveyor wall opposite to said given face thereof and in opposed relation to said screen inductor member for the transfer of charges between said conveyor and said second ionizing element, said screen inductor member being connected to said second ionizing element, and a high resistivity material extending about said inductor members at least at the edge portions of said inductor members that are disposed toward each other in a direction parallel to said path of movement of said conveyor wall.

9. An electrostatic machine as defined in claim 8 which comprises a layer of high resistivity material supported on said stator extending between said inductor members generally parallel to along and in spaced relation to said given face of said conveyor wall, said layer being electrically connected to said inductor members to provide a controlled gradient of potential therebetween.

10. An electrostatic machine as defined in claim 1 in which said face of said inductor member disposed toward said given face of said conveyor wall is uncovered by said high resistivity material.

11. An electrostatic machine as defined in claim 1 in which said high resistivity material covers said face of said inductor member disposed toward said conveyor wall and extends about edge portions of said inductor member that are in spaced relation to each other along said path of movement of said conveyor wall.

12. An electrostatic machine as defined in claim 1 which comprises charge transfer means disposed in the direction of movement of said conveyor wall in said path along said path from said inductor member, said transfer means comprising an electrode disposed adjacent and in spaced relation to said given face of said conveyor wall, and a body of high resistivity material extending generally parallel to said path of movement of said conveyor between said inductor member and said electrode and electrically connected to said inductor member and said electrode to determine a potential gradient therebetween, said body of high resistivity material extending upon and covering said face of said inductor member disposed toward said given face of said conveyor wall.

13. An electrostatic machine comprising a conveyor providing a wall of insulating material having opposite faces thereof extending generally parallel to a given dimension of said conveyor wall, a supporting member of insulating material disposed adjacent and in spaced relation to a given face of said conveyor wall and having a surface extending along said face generally parallel to said dimension of said conveyor wall, a conductive inductor member supported by said supporting member and having a face disposed toward and adjacent and in spaced relation to said given face of said conveyor wall and having between edge portions thereof an extent generally parallel to said dimension of said conveyor wall, said inductor member at said face thereof being uncovered by said supporting insulating member, a covering of high resistivity material extending about said inductor member at least a given one of said edge portions of said inductor member, and an ionizing element supported adjacent the other face of said conveyor wall in opposed relation to said inductor member for developing an electric field between said inductor member when charged and said ionizing element, said conveyor wall and said supporting member being supported for movement of said conveyor wall and said supporting member relative to each other parallel to said dimension of said conveyor wall, said conveyor wall and said ionizing element being supported for concomitant movement of said conveyor wall and said ionizing element relative to each other parallel to said dimension of said conveyor wall.

No references cited.