

[54] **ELECTRICAL INDUCTIVE APPARATUS**

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FOREIGN PATENTS OR APPLICATIONS

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[52] U.S. Cl.336/84, 174/35 R
 [51] Int. Cl.H01f 15/04
 [58] Field of Search336/69, 70, 84; 174/35 R

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[57] **ABSTRACT**

Electrical inductive apparatus having a static plate which includes a flat, electrically conductive sheet member disposed between first and second sheets of electrical insulating material, and electrically conductive edge strips disposed about the inner and outer edges thereof. The electrically conductive edge strips are formed of metallic wire cloth disposed to provide a single turn about a flexible insulating core. The metallic wire cloth is sized to provide at least one flap which extends outwardly from the insulating core, with the flap being of sufficient length to overlap the adjacent edge of the electrically conductive sheet member.

3 Claims, 6 Drawing Figures

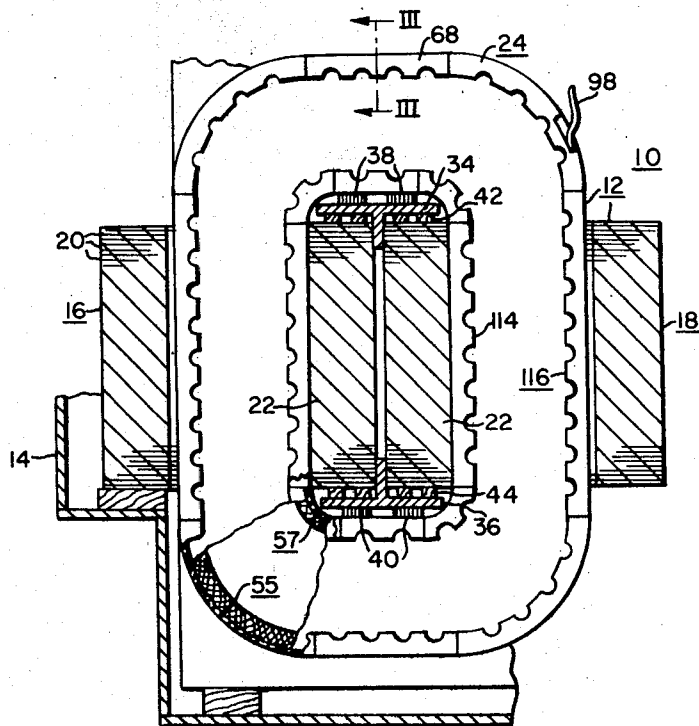


FIG. 2

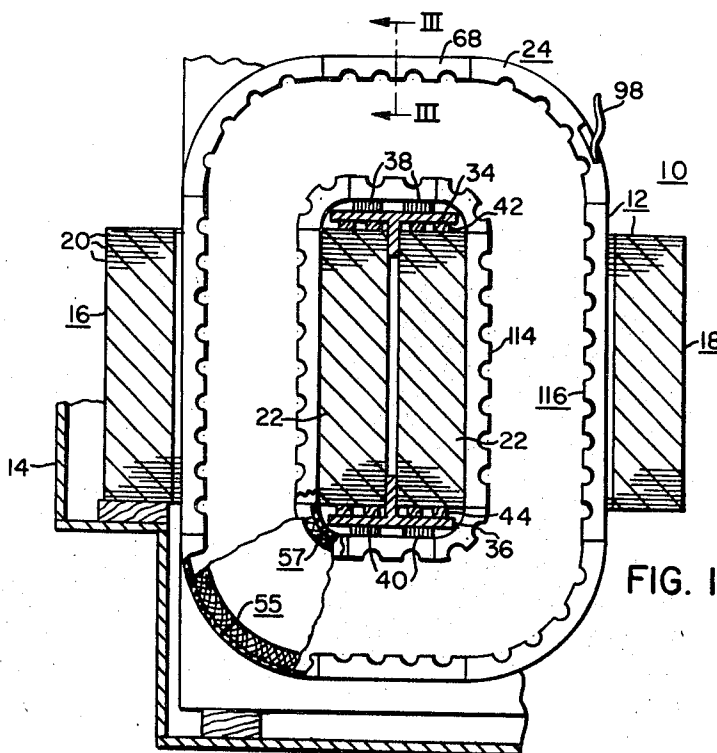
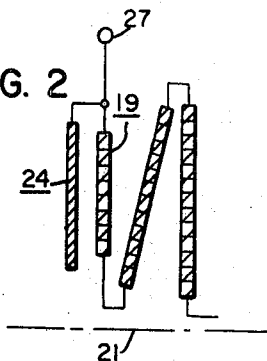


FIG. 1

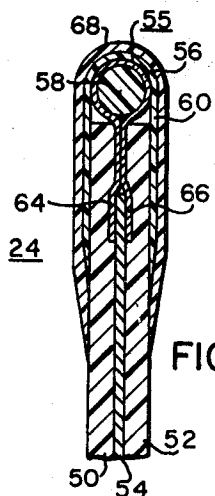


FIG. 3

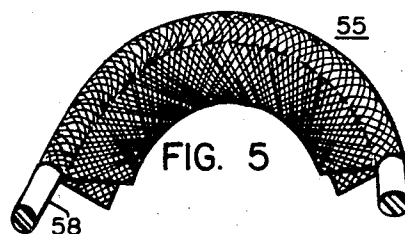


FIG. 5

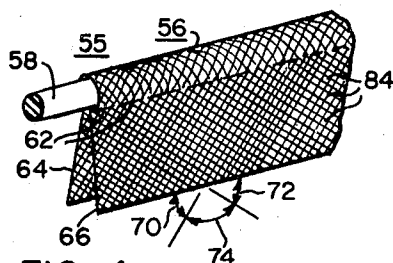


FIG. 4

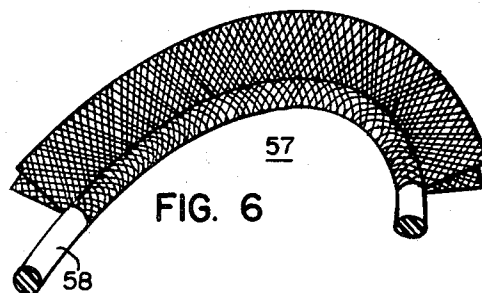


FIG. 6

WITNESSES

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ELECTRICAL INDUCTIVE APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates in general to electrical inductive apparatus, such as transformers and reactors, and more specifically to static plates for electrical inductive apparatus.

2. Description of the Prior Art

Electrical inductive apparatus, such as transformers and reactors of the type which utilize a plurality of disc or pancake type coils stacked in spaced side-by-side relation, to provide electrical clearance between the coils, and to provide cooling ducts for cooling the coils, commonly employ a static plate or shield to enforce a more favorable impulse voltage distribution across the coils. The pancake coils are electrically connected to form the winding, or windings, of the reactor or transformer, with the static plate usually being disposed adjacent to and electrically connected to the pancake coil which is connected to the line terminal of the apparatus.

The static plate for electrical reactors and transformers of the shell-form type usually includes two similar washerlike members formed of insulating sheet material, such as press-board, disposed in adjacent contacting relation, with a thin layer or coating of electrically conductive material disposed between them. The inner and outer edges of this conductive layer must be shielded, in order to prevent the formation of corona thereon, and this is accomplished by disposing solid, round electrical conductors, formed of a material such as copper, adjacent the edges to be shielded. The conductors of these edge strips are each electrically connected to the conductive layer at a single point, and they are electrically insulated with tightly wrapped cellulosic tape insulation. The inner and outer edges of the static plate are then fitted with insulating channel members, which hold the inner and outer conductive edge strips in place adjacent the edges of the static plate.

This prior art construction of the static plate possesses both mechanical and electrical disadvantages. The mechanical disadvantage occurs when the completed static plate is heated to approximately 135° C. to drive out any moisture therein, prior to its being impregnated with a liquid dielectric, such as oil. As the insulating washer members are heated and dried, they shrink, while the heated solid copper edge strips elongate due to the thermal expansion of the metal. These dimensional changes exert a substantial force on the insulating channel members which hold the edge strips in place, which may cause a mechanical displacement of the insulating members, and a corresponding reduction in their insulating strength. When the static plate is returned to ambient temperature, the solid copper edge strips return to their original dimensions, but the heat induced changes in the dimensions of the insulating channel members are permanent, causing a poor fit between the conductive edge strips and the edges of the static plate. The edge strips, therefore, do not perform their shielding function as efficiently as they should.

An electrical disadvantage of the prior art construction is due to the fact that the diameter of the solid conductor of which the edge strips are formed is limited to a maximum dimension of approximately 0.25 inch. This limitation is due to eddy and circulating currents induced into the edge strip conductor by the stray or leakage flux from the transformer or reactor. When the diameter of the edge strip conductor is increased, the cross-sectional area of the conductor is increased, which increases the magnitude of induced voltages therein due to more lines of magnetic flux cutting the conductor. Further, increasing the cross-sectional area reduces the electrical resistance of the conductor to current flow. Thus, in order to prevent the edge strip conductors from becoming hot enough to destroy the surrounding insulation due to I²R losses, the practical limit on the diameter of the conductor is approximately 0.25 inch. This size limitation becomes a disadvantage on transformers and reactors having high-basic insulation levels (BIL), for example on those having a BIL of 1675 K.V. and higher, as the stresses at these voltages require the edge

conductor to have a diameter greater than 0.25 inch, in order to reduce the potential gradient (volts per mil) at the surface of the conductor below the corona inception level.

SUMMARY OF THE INVENTION

Briefly, the present invention relates to electrical inductive apparatus having a new and improved static plate structure which includes a sheetlike conductive member disposed between electrical insulating sheet members, with edge strips or shields disposed about the inner and outer edges of the electrical insulating means. The edge strips are constructed from a metallic wire cloth which is wrapped about a ropelike core of electrical insulating material. The metallic cloth for each of the inner and outer edge strips has a predetermined width dimension, which is substantially greater than the circumference of the insulating core, and the core, in one embodiment of the invention, is placed to bisect the width dimension as it is being wrapped with the wire cloth, leaving two flaps extending outwardly from the insulating core which are of substantially equal length. The flaps are disposed to overlap and contact the adjacent edges of the sheetlike conductive member of the static plate, on opposite sides thereof, forming a smooth, continuous, electrically conductive surface between the flat sheetlike conductive member of the static plate and the edge shielding members. This structure solves the mechanical problem, as the metallic wire cloth and core assembly may be readily formed to closely conform to the edges of the static plate, and its insulating core which may be formed of cellulosic insulation, changes its length dimension as the insulating sheet members change their dimensions during drying, to maintain the tight fit desired. The metallic wire cloth is free to change its dimensions, along with the cellulosic core, due to its woven construction.

The metallic wire cloth also solves the electrical problem, allowing the diameter of the conductor to be increased above 0.25 inch, due to the higher resistance of the wires of the metallic cloth to eddy and circulating currents. The stranded, woven construction of the metallic wire cloth results in a substantial lowering of the quantity of metal used, compared with prior art constructions, and the metallic cloth, with its relatively high-contact resistance between the strands of the cloth, reduces the magnitudes of the eddy and circulating currents, greatly reducing the heating of the edge shield due to its I²R loss. The overlapping of the edges of the main flat conductive portion of the static plate by the edge shielding members makes positioning of the edge shield less critical, and the sandwicheing of the main conductive member between the flaps of the edge shield contain all the edges within the shield, which is especially important if metallic wire cloth is also used for the main conductive portion of the static plate.

BRIEF DESCRIPTION OF THE DRAWINGS

Further advantages and uses of the invention will become more apparent when considered in view of the following detailed description of exemplary embodiments thereof, taken in connection with the accompanying drawings, in which:

FIG. 1 is an elevational view, in section, partially cut away, of electrical inductive apparatus having a static plate which is constructed according to the teachings of the invention;

FIG. 2 is a fragmentary, cross-sectional view which illustrates how a static plate may be mechanically disposed and electrically connected relative to the pancake coils of electrical inductive apparatus;

FIG. 3 is a fragmentary, cross-sectional view of the static plate of FIG. 1, taken along the line III—III, which illustrates the teachings of the invention; and

FIGS. 4, 5 and 6 are perspective views of the edge strip of the static plate illustrated in FIGS. 1 and 3, showing a straight portion, an outside curved portion, and an inside curved portion, respectively.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the drawings, and FIG. 1 in particular, there is shown an elevational view, partially cut away, in section, of electrical inductive apparatus 10, such as a power transformer or reactor. Inductive apparatus 10 is illustrated as being of the shell-form type, but any construction, such as inductive apparatus of the core-form type, may utilize the teachings of the invention where applicable.

Inductive apparatus 10 includes a magnetic core-winding assembly 12 disposed in a tank or casing 14, which is shown partially cut away. Tank 14 may be filled to a predetermined level with a suitable insulating and cooling dielectric fluid, such as transformer mineral oil. As is customary in transformers of the shell-form type, the magnetic core-winding assembly 12 includes first and second magnetic core sections 16 and 18, respectively, each formed of a plurality of stacked, metallic, magnetic laminations 20, arranged to form at least one opening for receiving electrical coils, and with the magnetic core sections being disposed in side-by-side relation to form a common winding leg portion 22. Inductive apparatus 10 may be of the single-phase, or of the polyphase type, and if a transformer, it may be of the isolated winding, or of the autotransformer type. The magnetic core-winding assembly 12 also includes a stack of pancake type coils, such as shown in the fragmentary cross-sectional view in FIG. 2, all arranged on, and symmetrical about, a common center line 21, and electrically connected to form the winding, or windings of the electrical apparatus. Inductive apparatus 10 has been sectioned adjacent the static plate 24, which is disposed adjacent the pancake coil 19 and connected to the line terminal 27. Therefore, the pancake coils which make up the winding, or windings, are not illustrated in FIG. 1, but it will be understood that they have the same general configuration as static plate 24, and that they are all stacked such that their openings for receiving the magnetic core are aligned, with the pancake coils being disposed about the winding leg 22.

Static plate 24, in the embodiment shown in FIG. 2, is positioned adjacent the line end pancake coil 19 of the high-voltage winding, and it is electrically connected to the pancake coil 19, or to the high-voltage line terminal 27. The static plate 24 provides one plate of a capacitor, with the adjacent line end coil 19 providing the other plate. When an electrical surge potential is applied to the high-voltage terminal, such as caused by lightning, or switching transients, the static plate 24 quickly charges the adjacent coil 19 and distributes the surge potential more uniformly across the plurality of coils located adjacent the line end of the winding. Static plates are also often used adjacent tapped coil sections, and they may be used in many other arrangements, such as those taught in U.S. Pat. No. 3,376,530, which is assigned to the same assignee as the present application.

Corona shields and support means may be included at the upper and lower spaces between the pancake coils and the core leg portion 22. For example, metallic T-beams 34 and 36, stacked metallic, magnetic laminations 38 and 40 for magnetically shielding the T-beam, and wedges 42 and 44, may be provided at the upper and lower spaces, respectively, which construction is known in the art.

FIG. 3 is a cross-sectional view of static plate 24, taken along the line III—III, with the static plate 24 being constructed according to the teachings of the invention. In this embodiment of the invention, static plate 24 includes first and second sheet-type insulating members 50 and 52, formed, for example, of pressboard, which members have the same general configuration as the pancake coils. In other words, each sheet of insulating material has first and second major sides, each sheet is relatively thin, for example 0.125 inch thick, and each has an opening sized to receive core leg portion 22 of the magnetic core sections 16 and 18. The electrically conductive portion 54 of the static plate also has first and second major surfaces or sides, and it is disposed between the two insulating sheet members 50 and 52, and secured in posi-

tion, such as with an adhesive. The conductive portion 54 is purposely sized to provide a small space between its edges and the inner and outer edges of the insulating sheet members, to insure that the conductive portion of the static plate is completely surrounded by electrical insulation. In order to provide a rounded, equipotential surface adjacent the inner and outer edges of the conductive portion 54, to prevent electrical stress from concentrating on these edges, conductive edge strip 55 is disposed in radially spaced relation about the outer edge, and as illustrated in the cut away portion of FIG. 1, a similar structure 57 is disposed about the inner edge. Edge strip 55 has a conductive portion 56 disposed about an insulating core 58, which is insulated with suitable electrical insulating means 60, such as crepe paper tape. Conductive portion 56, and the corresponding conductive portion of the inner edge strip 57, are electrically connected to conductive portion 54 of the static plate, as will be hereinafter explained, and they are held in position by insulating channel members, such as by channel member 68, which members may be formed of pressboard and glued to the insulating sheet members 50 and 52.

The electrically conductive portion 54 of the static plate 24 may be formed of electrically conductive foil, such as copper or aluminum, with the foil being disposed in a predetermined pattern to minimize heating due to eddy currents produced by the leakage flux of the apparatus; or it may be formed from metallic wire cloth, as disclosed in U.S. Pat. No. 3,376,531, which is assigned to the same assignee as the present application. Regardless of how the electrically conductive portion 54 of the static plate 24 is formed, it has a circumferential discontinuity to prevent its acting as a shorted turn about the magnetic core leg 22, and the outer and inner edge strips 55 and 57, respectively, also each have a circumferential discontinuity to prevent their acting as shorted turns.

As hereinbefore explained, edge strips constructed according to the teachings of the prior art present manufacturing problems, and on high voltage electrical inductive apparatus they may create electrical problems. When the edge strip 55 includes a conductive portion formed of solid metal, such as copper, it is difficult to bend the edge strip to closely conform to the inner and outer edges of the static plate 24. Then, the problem is compounded when the static plate is heated to approximately 135° C. to drive out moisture prior to the step of impregnating the structure with an insulating dielectric, such as transformer mineral oil. The solid copper conductor elongates while the insulating sheet members 50 and 52 shrink, and then upon cooling, the copper conductor returns to its original dimensions while the sheet members 50 and 52 retain their shrunken dimensions. This change in relative dimensions stresses the insulating channel members, such as the channel member 68, which may cause voids between the edge strips and insulating sheet members 50 and 52, reducing the insulating and shielding value of the structure. This mechanical problem and the electrical problem imposed by the limitation on the maximum diameter of the solid edge strip conductor due to its heating, which makes its use marginal or undesirable in extra high-voltage class apparatus (EHV), are solved by the teachings of this invention.

More specifically, instead of forming the edge strip 55 with a solid electrical conductor, the edge strip 55 is formed with a metallic wire cloth which is tightly wrapped, with a single turn, about the outer surface of a rope-like insulating core 58. The edge strip 55 is shown in a partially disassembled, fragmentary, perspective view in FIG. 4, in order to more clearly illustrate its construction. The conductive portion 56 of edge strip 55 is formed of a metallic wire cloth of sufficient length to completely shield its associated edge of the static plate 24, and having a width dimension which is substantially greater than the circumference of the insulating core 58. The insulating core 58 is preferably placed on the metallic cloth 56 to bisect its width dimension, and the edges of the wire cloth are then folded up about the core 58. The metallic wire cloth 56 is pinched together as each folded side of the metallic wire cloth covers substantially one-half of the circumference of the insu-

lating core, and it is fixed in this position by stitching, indicated at 62, stapling, or by any other suitable fastening means. Thus, after the metallic wire cloth 56 is wrapped about the core 58 with a single turn and stitched or stapled to maintain this position, flaps 64 and 66 extend outwardly from the insulating core 58. The flaps 64 and 66 are very important for reasons which will be hereinafter described. The outwardly extending flaps 64 and 66 of the metallic wire cloth must be of sufficient length to overlap the main conductive portion 54 of the static plate, as illustrated in FIG. 3. The outwardly extending flaps 64 and 66 overlap the first and second major opposed surfaces or sides, respectively, of the main conductive portion 54, with the flaps overlapping the edges of the main conductive portion by a predetermined dimension, which dimension is not critical. The flaps should have sufficient length such that during the manufacture of the static plate, they will not pull completely away from the edges of the main conductive portion 54, but will maintain their overlapping position. This construction provides a continuous mechanical and electrical contact between the edge shield and the main conductive portion 54, at both the inner and outer edges of the main conductive portion 54. Good electrical contact between the shield and main conductive portion 54 may be assured by applying an electrically conductive adhesive between the flaps and the main conductive portion 54, or by soldering or spot welding the flaps to the main conductive portion. This enveloping or sandwiching of the edges of the main conductive portion 54 by the flaps of the edge shields removes the criticality in the placement, and the maintenance of the placement during manufacture, of the edge shields. If the edge shield constructed according to the teachings of the invention should pull away mechanically from the edges of the insulating sheet members 50 and 54, the overlapping flaps of the edge shield will still envelop and shield the main conductor. The sandwiching of the edges of the main sheet conductor 54 is especially important when metallic wire cloth is also used to form the main conductive portion 54 of the static plate, as it shields any loose ends of the wire cloth of the main conductive portion 54, which may otherwise present a problem.

While the embodiment of the invention shown in FIG. 3, wherein two flaps extend outwardly from the insulating core of the edge strip, to sandwich or envelop the main conductive portion 54, it would also be practical to form the edge shield 55 such that it has a single flap which overlaps and contacts only one of the major surfaces of the main conductive portion 54.

In order to successfully apply the metallic wire cloth 56 to the insulating core 58, and to form the resulting assembly to closely conform to the curved inner and outer edges of the static plate 24, it is important that the wire cloth be bias woven, and that the edges of the wire cloth be selvaged. The bias weaving directs the metallic wires of the cloth diagonally across the cloth, instead of being perpendicular to the edges thereof, providing angles 70 and 72 between the two directions of the wires and the edges of the cloth, which angles are less than 90°, such as 45°, even though the angle 74 between the two directions of the wires may be 90°. The bias weaving is important as it enables the edge shield members to be bent around the outside curves, as shown in FIG. 5, or around the inside curves, as shown in FIG. 6, of the static plate, without wrinkling. A smooth, wrinkle-free surface of the edge shield is of the utmost importance, in order to provide corona free operation. The selvaging of the edges is a finish which is applied to the edges which prevents raveling or loose ends.

The ropelike insulating core 58 is preferably formed of a cellulosic material, such as cotton, so that it will change its dimensions upon heating and drying in a manner similar to the change in the dimensions of the insulating sheet members 50 and 52, which are commonly constructed of pressboard. Pressboard is a cellulosic insulation with its usual construction being a mixture of wood and cotton fibers.

The metallic wire cloth 56, which is tightly wrapped about the insulating core 58, to provide a single turn thereon, is formed from a large plurality of relatively fine strands or wires 84. While the diameter of the individual strands 84 is not critical, the diameter should be selected to be as small as practical. Very fine or small diameter wire strands provide a substantially smooth outer surface on the metallic wire cloth 56, which is necessary in order to reduce the potential gradient at its surface below the corona inception level. Fine strands also add to the flexibility of the edge strip, facilitating its handling and bending. Further, fine strands are individually so flexible that any broken ends that may extend outwardly from the surface of the cloth will be bent inwardly to conform to the surface of the conductor, when the edge shield is subsequently insulated. This is important, as any outwardly extending wires or strands may cause the formation of corona. Small diameter strands also aid the structure electrically, as reducing the diameter of the strands increases their resistance to the flow of electrical current. Small diameter strands also allows more strands to be utilized per linear inch in the cloth, which reduces the magnitude of circulating currents due to the larger number of contacts between the strands.

The diameter of the edge shield, the diameter of the individual strands in the metallic wire cloth of which the edge shield is formed, and the dimension to which the edge shield is insulated, will depend upon the specific application, the voltage rating, and the basic insulation level (BIL) of the apparatus. For example, an edge shield in which the curved or circular portion has a diameter of 0.305 inch, formed of stainless steel wires each having a diameter of 0.0022 inch, and a mesh of 145×145 per linear inch, is suitable for a transformer or reactor rated 1,800 K.V. BIL. Edge shields formed of metallic wire cloth of this construction, having flaps with a length dimension of 1.5 inch, have been wrapped around inside and outside radii as small as 5 inches without difficulty, providing a smooth, wrinkle-free surface.

While the metallic wire cloth in this example was constructed with stainless steel wires, it is to be understood that other metals, such as aluminum, copper, and the like, may be used. When higher resistivity materials are used, the outside diameter of the edge shield may be increased without suffering excessive losses due to eddy and circulating currents.

Static plate 24, as illustrated in the fragmentary, cross-sectional view of FIG. 3, may be constructed by providing insulating washers or sheet members 50 and 52, such as by cutting them from 0.125 inch thick pressboard, with their outer dimensions defining a round cornered rectangle, which is substantially the same configuration as the outer dimension of its associated adjacent pancake coil, or coils, and they each have an inner opening, as illustrated in FIG. 1, sized to receive the leg member 22 of the magnetic core sections 16 and 18. The next step is to prepare the conductive portion 54 of the static plate 24, which is to be sandwiched between the insulating sheet members 50 and 52. The conductive portion 54 may be formed of metallic cloth, such as stainless steel having an electrical resistance between 0.02 and 2 ohms per square, but other constructions may be used, for example conductive foil may be used, if desired.

An electrical conductor 98, shown in FIG. 1, is provided for connecting the conductive portion 54 of the static plate 24 to the pancake coil 19, or to the line terminal 27. Conductor 98 may be soldered, or otherwise electrically connected directly to the conductive portion 54, or it may be connected to the conductive portion of the edge strip 55.

The electrically conductive portion 54 is sized with its outer dimensions slightly less than the outer dimensions of the sheet insulating members 50 and 52, and with the dimensions of its inner opening being slightly larger than the dimension of the inner opening of the sheet insulating materials, in order to provide a short distance, such as 0.25 inch, between the inner and outer edges of the conductive portion 54 and the inner and outer edges of the insulating sheet members 50 and 52. If the main conductive portion 54 is formed of a metallic wire cloth,

its inner and outer edges may be smooth by running a solder bead along its edges.

The main conductive portion 54 is placed on one of the sheet insulating materials, in the proper position, such as on member 50, and the edge strips 55 and 57 are disposed about the inner and outer edges of the insulating member. The outwardly extending flaps of the edge shields 55 and 57 are disposed to overlap opposite sides of the outer and inner edges of the main conductive portion 54, and the flaps are electrically connected thereto, such as with an electrically conductive adhesive, to provide a good continuous electrical contact, or the flaps may be soldered or welded to the main conductive portion 54.

An adhesive is applied to the sheet insulating members 50 and 52, or to the electrically conductive portion 54 or both, and the conductive portion 54 is "sandwiched" between the insulating sheet members 50 and 52. The resulting structure is pressed until the adhesive has cured.

The next step is to insulate the inner and outer edge strips 55 and 57, such as with crepe paper tape, providing a predetermined build dimension of insulation 60 about conductor 56 of edge strip 55, and similar insulation about the inner edge strip 57.

The edge strips 55 and 57 are permanently secured in assembled relation with the insulating sheet members 50 and 52, by disposing insulating channel members, such as channel members 114 and 116, about the inside and outside edges of the static plate, and gluing them in position. The insulating channel members may be formed of pressboard, or laminated crepe paper. The insulating channel members are disposed completely about the inside and outside edges of the insulating sheet members 50 and 52, as shown in FIG. 1.

The static plate is then ready for assembly in the electrical inductive apparatus it is to be associated with, at which time electrical lead 98 will be electrically connected to a predetermined pancake coil, or the line terminal of the apparatus.

In summary, there has been disclosed new and improved electrical inductive apparatus, such as electrical power transformers and reactors, which are improved mechanically and electrically over similar electrical inductive apparatus of the prior art. The electrical inductive apparatus utilizes a static plate structure which retains its compactness without creating stresses between the edge shielding strips and the insulating sheet members during the processing of this static plate. The edge shields of the static plate, in addition to being easily bent to conform to the edges of the insulating sheet members, change their dimensions along with the changes in the dimensions of the insulating sheet members, to retain a tight fit between the edge strips and the insulating sheet members. A slight pulling away from the edge strips, however, is not critical, due to the overlapping of the outwardly extending flaps of the edge strips, over opposite sides of the main conductive portion of the static plate. The use of the metallic wire cloth in the static plate shielding strips also overcomes prior art max-

imum size limitations on the diameter of the conductive portion of the edge strip. This is important, as the prior art size limitation is a distinct disadvantage with the recent trend to higher voltages. The woven metallic wire cloth portion of the edge strip, which includes a plurality of small diameter wires or conductive strands, effectively limits circulating currents due to the relatively high resistance of the small diameter strands to the flow of electrical current, and to the contact resistance between the large plurality of strands. Thus, the diameter of the conductive portion of the edge shields may be increased to the diameter necessary to reduce the potential gradient at the surface of the metallic cloth below the corona inception level, without the danger of overheating the insulation surrounding the edge strip shielding members due to the I²R loss in the conductive portion of the shields. Still further, the edge strips form continuous mechanical and electrical contact with the main conductive portion of the static plate, completely enveloping the inner and outer edges of the static plate, which forms a more effective electrical and magnetic shield for the edges of the main conductive portion of the static plate than prior art types of static plate edge shields which utilize a discrete circular solid conductor adjacent the edges of the static plate.

I claim:

1. Electrical inductive apparatus comprising:

a magnetic core,

a plurality of pancake coils disposed in inductive relation with said magnetic core, said plurality of pancake coils being electrically connected to provide at least one winding,

and at least one static plate disposed adjacent a predetermined pancake coil, said static plate including an electrically conductive member having first and second major opposed sides, means electrically insulating said electrically conductive member, and edge strip means disposed about the edges of said static plate for shielding the edges of said electrically conductive member,

said edge strip means including a core member formed of an electrically insulating material, an electrically conductive member formed of metallic wire cloth which is folded about said core member, said metallic wire cloth having a width dimension sufficient to provide first and second outwardly extending flaps, said flaps overlapping and electrically contacting said first and second major opposed sides, respectively, of said electrically conductive member.

2. The electrical inductive apparatus of claim 1 including insulating channel members disposed about the edges of the static plate, to hold the edge strip means in a close-fitting manner relative to the edges of the static plate.

3. The electrical inductive apparatus of claim 1 wherein the edges of the metallic wire cloth of which the edge strip means is formed are selvaged.

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