Sept. 30, 1969 J. R. RADINGTON-MEECH ET AL 3,470,416

STATIC ELIMINATORS

Filed Sept. 21, 1966

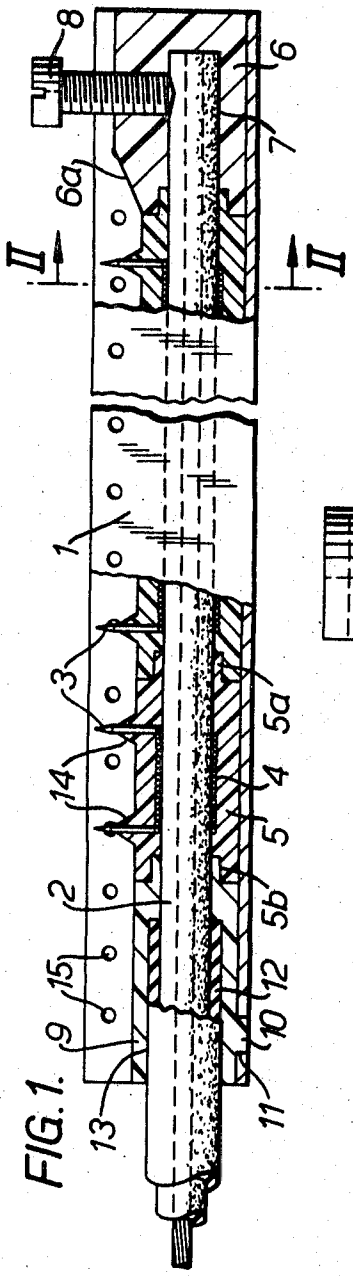


FIG. 1.

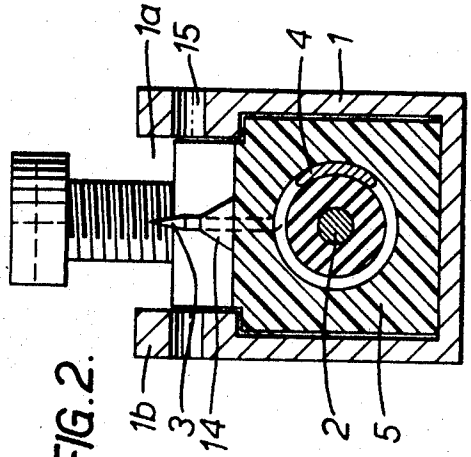


FIG. 2.

Inventors
John Richard Radington-Meech
George Thomas Wright

Strauch, Nolan, Neale, Nies & Bronaugh
Attorneys

United States Patent Office 3,470,416
Patented Sept. 30, 1969

3,470,416

STATIC ELIMINATORS

John Richard Radington-Meech, Sidlow, near Reigate, and George Thomas Wright, Sydenham, London, England, assignors to Industrial Electrical Company Limited

Filed Sept. 21, 1966, Ser. No. 580,951
Claims priority, application Great Britain, Sept. 22, 1965, 40,370/65
Int. Cl. H05f 3/06
U.S. Cl. 317—2 6 Claims

ABSTRACT OF THE DISCLOSURE

A static eliminator comprising an elongated casing, an electrically conductive member extending within and insulated from the casing, an electrical discharge means including electrodes and a wire coil embedded in a plurality of apertured units of insulating material which are threaded over the conductive member and located in end-to-end relation within the casing, with the electrical discharge means being capacitively coupled to the conductive member and being operative to create an ionizing field between the conductive member and the casing upon application of a high voltage.

This invention relates to static eliminators, that is, to devices for neutralizing static charges which develop on machinery and on articles processed by or made on such machinery as a result of frictional, electrical, mechanical or other forces. Such static eliminators are, for example, used in the printing, textile processing, paper converting and plastics manufacturing trades.

It is already known to provide astatic eliminator in the form of a bar comprising an electrically conductive apertured casing surrounding and substantially enclosing discharging means which are air spaced and electrically insulated from the casing and are fitted with electrodes each extending into an aperture of the casing, and an electrically conductive member capacitatively coupled with the discharging means, whereby application of a high voltage between the casing and the conductive member established an ionizing field between the electrodes and the casing while the capacitative coupling avoids risk of serious electric shock to a person inadvertently contacting the discharging means.

A disadvantage of such known devices is that, in the event of electrical breakdown or other damage, it is necessary to replace the entire bar and it is the principal object of the present invention to provide a bar of which a damaged part can readily be replaced. The invention also provides a bar-type static eliminator which can readily be made up to any desired length and which can be lengthened or shortened at small cost.

According to the invention a static eliminator of bar form comprises an elongated casing or sheath, an electrically conductive member extending within and insulated from the casing, and electrical discharge means capacitatively coupled to the conductive member and including electrodes air spaced from the casing and adapted to create therewith an ionizing field upon application of a high voltage between the conductive member and the casing, said electrodes being embedded in a plurality of apertured units of insulating material which are threaded over the conductive member and are located in end-to-end relation within the casing.

Reference will now be made to the accompanying drawings which illustrate a preferred embodiment of the invention and wherein:

FIG. 1 is a longitudinal section through the improved static eliminator and

FIG. 2 is a cross section on the line II—II of FIG. 1 and to an enlarged scale.

As shown the static eliminator bar comprises a channel-section aluminum or other metal casing or sheath **1** having the open side or slot **1***a* uppermost, a conductive member in the form of a single core high voltage cable **2** of circular cross section and a plurality of electrodes **3** vertically disposed between the opposed walls of the slot **1***a* and capacitively and inductively coupled to the cable **2**. The electrodes may be arranged singly or in pairs or sets. In the construction shown, pairs of electrodes are constituted by the radially directed end portions of tightly wound wire coils **4** closely encircling the cable **2**. Each coil **4** is enclosed in a unit or "bead" **5** of insulating material which is apertured to fit over the cable **2** and has a shape to fit closely within the casing **1**. Preferably, the side walls of the casing have thickened upper portions **1***b* where they define the longitudinal slot **1***a*, the units or "beads" being correspondingly rebated at their upper edges so that having been slid endwise into the casing they are located against displacement. To provide a more compact and unitary assembly the units or "beads" **5** are formed at one end with a projecting spigot-like portion **5***a* and at the other end with a corresponding size recess **5***b* such that the units interlock on assembly as shown in FIG. 1.

In practice the required number of units **5** depending upon the length of bar to be constructed are threaded onto the cable **2** and the assembly is entered in the casing **1** and retained therein by appropriate means. In the drawings there is shown at one end of the bar an insulating block **6** interlocking with the adjacent unit **5** and having a blind bore **7** within which the forward end of the cable **2** is secured by a set screw **8** or equivalent means. At the other end of the bar the cable **2** passes through an apertured block **9** which also interlocks with the adjacent unit **5** and which has a locating stud **10** adapted to engage in a corresponding hole **11** in the base wall of the casing. The lead-in portion of the cable **2** preferably includes an additional shroud or sleeve **12** of insulating material the end of which is received within a counterbore **13** in the block **9** and is secured in position by adhesive or other means so assisting in forming a rigid interlocked assembly.

It will be seen that with the construction above described the longitudinal slot **1***a* at the upper side of the bar has a floor of insulating material from which projects a line of spaced electrodes and, to prevent current creepage or tracking between the electrodes and the casing wall portions **1***a*, the units **5** are formed with upstanding pips or buttresses **14** through which the electrodes extend. It is also found desirable to encourage air flow around the electrodes and for this purpose apertures **15** may be provided in the casing wall portions **1***a*. In use such air flow and the operation of the bar will result in a tendency for dust to collect in the slot **1***a* but a taper **6***a* on the rear end of the block **6** and the inclined walls of the buttresses **14** will facilitate removal of the dust by brushing.

In the event of electrical breakdown or other damage confined to an individual bead or unit **5**, it is an easy matter to withdraw the cable **2**, replace the damaged bead and reinsert the cable to complete the bar. Similarly, to lengthen or shorten an existing bar a sufficient number of the units **5** is added to or removed from the assembly to match a substitute casing of the required length.

We claim:

1. A static eliminator comprising an elongated casing, an electrically conductive member extending within and insulated from the casing, and electrical discharge means capacitively coupled to the conductive member

and including electrodes air spaced from the casing and adapted to create therewith an ionizing field upon application of a high voltage between the conductive member and the casing, said electrodes being embedded in a plurality of apertured units of insulating material which are threaded over the conductive member and are located in end-to-end relation with the casing, a wire coil embedded in each insulated unit so that it closely embraces the insulation of the conductive member when the unit is threaded thereon, and the electrodes in each unit connected to and extending radially outwardly from said coil.

2. A static eliminator as claimed in claim 1, wherein the casing is of channel form with its open side uppermost, the conductive member with the insulating units threaded thereon being located in the lower part of the channel, and the electrodes projecting upwardly from the insulating units and being disposed in the open slot formed between the upper end portions of the side walls of the casing.

3. A static eliminator as claimed in claim 1, wherein the insulating units are provided with upstanding pips or buttresses at the points where the electrodes emerge and through which the electrodes extend.

4. A static eliminator as claimed in claim 1 wherein the casing wall portions defining the open slot are apertured.

5. A static eliminator as claimed in claim 1, wherein the insulating units are formed at their ends to provide spigot and socket interconnection between adjacent unit.

6. A static eliminator as claimed in claim 1, wherein the assembly of conductive member in the form of an insulated cable and the insulated units threaded thereon are retained within the casing by end blocks, one block having a blind bore within which the forward end of the cable is secured by a set screw or equivalent means, whilst at the other end of the device the cable passes through an apertured block having a stud and socket connection with the casing and preferably having a counterbore within which is secured the end of an additional insulating sleeve on the cable.

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LEE T. HIX, Primary Examiner

U.S. Cl. X.R.

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